



Officers of SEAFDEC/AQD and NFRDI pose at the field testing site of the low-cost aquaculture feed project. See full story on page 3. [PHOTO BY JF ALDOM]

# aqd matters

May-June 2019

Newsletter of the SEAFDEC Aquaculture Department, Tigbauan, Iloilo, Philippines

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# Global experts: Info sharing on aquaculture a must in ASEAN

**ILOILO CITY** – Global experts in aquaculture said in a recent international workshop here that to enhance successes in resource enhancement and prevent failures in the aquaculture industry, member-countries of the Association of Southeast Asian Nations (ASEAN) must share information.

The appeal was made at the *International Workshop on the Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA)* organized by the Southeast

Asian Fisheries Development Center/Aquaculture Department (SEAFDEC/AQD) on 25-27 June 2019 at Richmond Hotel Iloilo.

The experts said sharing information among ASEAN member-countries was in view of the need for stronger capabilities in the detection of diseases in aquaculture resources so that aquaculture industries and institutions engaged in aquaculture and resource enhancement avoid repetitions of mistakes.

“Aquaculture is growing and the gap is really widening in terms of disease detection capability. I firmly believe

that working together is much better than working in isolation. If we work together, we will be benefited much faster,” said Dr. Arun Dhar, a speaker from the University of Arizona.

Other recommendations during the workshop, funded by the government of Japan, were the enforcement of the established guidelines on disease surveillance and disease reporting and the adoption of established guidelines for food safety and traceability.

On the other hand, SEAFDEC/AQD expert Dr. Jon Altamirano shared

*Continued on next page...*





the same view as Dr. Dhar on enhancing information sharing among ASEAN countries, emphasizing during his synthesis of the workshop that there is insufficient awareness on resource enhancement successes and failures among ASEAN member countries.

The Japanese were also concerned about aquatic diseases, with Mr. Akito Sato, Japanese Trust Fund Program Manager and SEAFDEC Deputy Secretary-General saying in his closing remarks, "I hope SEAFDEC/AQD and member countries continue activities for preventing aquatic disease in advance and promoting early warning more effectively as well as



Participants from ASEAN member-countries (standing) at the *International Workshop on the Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA)* have their photo taken with invited experts Dr. Kallaya Sritunyalucksana-Dangtip (seated, leftmost), Dr. Arun Dhar (seated, 2nd from left), Dr. Jon Altamirano (seated, rightmost), and Dr. Satoshi Watanabe; and SEAFDEC officials (seated, 3rd-7th from left) Dr. Edgar Amar, Mr. Akito Sato, Mr. Dan Baliao, Dr. Koh-ichiro Mori, and Dr. Leobert de la Peña. PHOTO BY JF ALDON

strengthening laboratory capacity for aquatic disease."

There were four aquaculture experts from across the globe who shared their knowledge

on aquatic animal health, sustainable aquaculture, and resource enhancement to 53 participants in the SARSEA. The participants also reported on the status of

sustainable aquaculture and resource enhancement and aquatic animal health of their respective countries. [a](#)

- RH LEDESMA/HP VILLA

# Japan sponsors training of Iloilo high school science teachers

TO IMPROVE the quality of science education in Iloilo, the Government of Japan sponsored a three-day training for 23 high school science teachers from 13 public high schools in Iloilo.

Held from 21 to 24 May 2019 at the Southeast Asian Fisheries Development Center/Aquaculture Department (SEAFDEC/AQD) in Tigbauan, Iloilo, the science teachers received lectures from SEAFDEC/AQD scientists and specialists on general aquaculture principles, genetics and biotechnology in aquaculture, basic microscopy, and science research.

The teachers were hands-on in the training on reference management, statistical design and analysis, and writing a research proposal. As a final output, the teachers came up with simple and doable research proposals.

Mark William Sazon, science teacher of Mina National High School and one of the participants, said that so far, the course was the most comprehensive, well organized, and most informative among the trainings he has attended.

"It is because of this training course I can say to myself that I'm already confident enough to face my students," he added.

The teachers expressed their gratitude to the Government of Japan for funding the training, as well as SEAFDEC/AQD as the training organizer.

"To be honest, I'm a science teacher but in-depth analysis and techniques is not common to me because *hapaw* (superficial) *lang ang amon* knowledge about that one. So for the lecturers, thank you very much," said John Paul Frajillo of Guimbal National High School.



Participants prepare a research proposal as their final output for the training course. PHOTO BY R PAGADOR

The training participants, nominated by the Department of Education Division of Iloilo, were from Alimodian National High School, Don Felix Serra National High School, Dumangas National High School, Guimbal National High School, Igaras National High School, Miag-ao National

High School, Mina National High School, New Lucena National High School, Oton National High School, San Joaquin School of Fisheries, Sta. Barbara National High School, Tigbauan National High School, and Tubungan National High School. [a](#)

- RH LEDESMA/RD DIANALA

# National drive to lower cost of aquafeeds kicks off in Guimaras

**NUEVA VALENCIA, Guimaras** – A new feed formulation that hopes to lower the cost of fish farming and make fish more affordable to the masses kicked off with the field-testing of the low-cost feed at the Igang Marine Station of the Southeast Asian Fisheries Development Center (SEAFDEC) last 15 May 2019.

The new formulation, developed by SEAFDEC's scientist Dr. Roger Edward Mamauag, uses cheaper alternative ingredients and will also be tested around the country in partnership with the National Fisheries Research and Development Institute (NFRDI) and the Bureau of Fisheries and Aquatic Resources (BFAR).

"Dr. Mamauag was able to have an initial comparison of this diet with a commercial diet before. Consistent *yung result, walang significant difference. Yung sizes ng bangus malaki pa rin kahit ito yung gagamitin,*" said Dan Balião, chief of SEAFDEC's Aquaculture Department (AQD).

Dr. Mamauag explained that the field testing of the feed in Guimaras is for milkfish reared in sea cages.



SEAFDEC/AQD chief Dan Balião (5th from right), scientist Dr. Roger Edward Mamauag (4th from right), and NFRDI interim executive director and BFAR assistant director for technical services Drusila Esther Bayate (6th from right) together with NFRDI and BFAR officers during the launching of the field testing project in Guimaras. PHOTO BY JF ALDON

This feed will also be tested in milkfish sea cages located in Pangasinan, La Union, and Guiuan, Eastern Samar. He also said that there will also be a field testing of low-cost aquaculture feed for tilapia in Muñoz, Nueva Ecija; Lala, Lanao del Norte; and Batangas.

"After *ng* run of these verification trials, we intend to give this formulation, if proven successful, to the private feed manufacturer for them to adopt," said Dr. Mamauag.

Moreover, according to Maria Theresa Mutia, chief aquaculturist of NFRDI,

commercial adoptors will be tapped for the validation of the verification trials on the third year of this three-year project. "*BFAR na yung bahala mag-identify kung sino yung mga magandang sites for the adoption,*" she said.

Drusila Esther Bayate, NFRDI interim executive director and BFAR assistant director for technical services, was also present during the launching in Guimaras and expressed NFRDI and BFAR's full support to SEAFDEC/AQD throughout the duration of this project.

"So we hope that this project will be a success. I

foresee it will be because of its practicality and it's really a very good technology... Actually you already have a research paper. So *ito na lang,* just to convince the private sector," said Bayate.

SEAFDEC/AQD through its Research Head, Dr. Leoberto de la Peña, also committed to consider this project as a top priority and to willingly share its expertise and technical capability to make this project a success. "As we all know; our main goal here is to lower aquaculture production cost for the benefit of fish farmers here in the Philippines," said de la Peña. **a**

- RH LEDESMA/RD DIANALA

## HRMS joins job fair of universities in Iloilo

THE Human Resource Management Section (HRMS) of SEAFDEC/AQD garnered 59 aspiring applicants from job fairs facilitated by the Iloilo Science and Technology University and the University of San Agustin. These two universities found in Iloilo held their job fair on 13 and 14 March 2019, respectively.

According to HRMS, attending both job fairs was a great venue in gathering a pool of applicants as well as creating a firm partnership with the universities' respective placement offices. Moreover, participating in job fairs increased AQD's visibility to students and other participating companies. **a**



PHOTOS COURTESY OF HRMS



# SEAFDEC/AQD-BFAR trains Leyte and Samar fish growers in aquaculture

**TACLOBAN CITY, Leyte** - An on-site training in marine aquaculture of high-value fishes was conducted at Hotel Alejandro in Tacloban City from 20 to 22 May 2019.

More than 80 participants, mostly BFAR training officers from Region 8 and private fish growers, attended the training.

Dr. Juan Albaladejo, BFAR regional director welcomed SEAFDEC/AQD lecturers recognizing the important role SEAFDEC has been playing in fish production through aquaculture. He recalled the Phase 1 JMANTTP (Joint Mission on Accelerated Nationwide Technology Transfer Program) in 1996 by conducting technology caravans reaching out to Filipinos. He also added that it was Mr. Dan Baliao, Technology Verification and Commercialization Head then, who was the implementing officer of the program under the term of Dr. Rolando Platon as AQD Chief. "I am indeed very happy that they are back to resume the project that significantly changed the landscape of fish production, where aquaculture technologies were brought right on the site where aquaculture is," he said.

Dr. Platon discussed extensively the overview of aquaculture suggesting which species can be done in a particular area. He also noted the state of aquaculture then and now in both global and national contexts. In lieu of Chief Baliao who was not able to make it at the time, Dr. Roger Edward Mamauag, Mr. Hanani Torrilla and Mr. Michael Tesorero



SEAFDEC/AQD consultant Dr. Rolando Platon and scientist Dr. Roger Edward Mamauag discuss the overview and updates in aquaculture, respectively. PHOTOS BY JF ALDON



Participants of the on-site training (right photo) listen to SEAFDEC/AQD technical assistant Mr. Michael Tesorero as he discusses the different types of cages used in aquaculture (left photo). PHOTOS BY JF ALDON

discussed the updates in aquaculture that he prepared including culture of high-value fishes in ponds and cages.

BFAR's disease expert, Dr. Riza Tapdazan's discussion of diseases in grouper left the fish farmers in awe for the technical knowledge that they learned. However, one fish grower suggested, "Although we now understand a bit of the reasons of fish kills, we would like to request that some of the terms mentioned be translated in vernacular." Another one added, "Thank you, now we know of some disease-causing agents." Dr. Tapdazan acknowledged that most of the information that she discussed come from SEAFDEC publications.

Relatedly, Ms. Therese Geanga advised the fish

growers that prevention is still better than cure as she enumerated the steps and procedures of good management practices in aquaculture. She also pointed out ways and preventive measures to avoid the entry of disease-causing agents that may harm the culture species.

During the open forum, the participants showed much interest in the topic discussed by Dr. Mamauag who tackled nutritional requirements and feeding management of cultured finfishes. The topic elicited curiosity as to how SEAFDEC/AQD could come up with a formulation considering their local resources that may lower the cost of feed. Dr. Mamauag promised to look into this in his future studies.

Fish growers claimed that they could no longer

produce as much from aquaculture due to scarcity of fry from the wild. It was mentioned that the fry they need has to be imported from Indonesia which they claimed were not at all that good. In that case, Dr. Platon explained the ongoing legislated hatcheries that SEAFDEC/AQD and BFAR are jointly implementing now. Hatchery is apparently a major concern of fish growers in the region.

A hatchery is an artificial way to breed, hatch, and rear through the early life stages of aquatic animals. It produces larvae and juveniles of fishes, shellfishes and crustaceans primarily to support the aquaculture industry. The hatchery-produced fry are then transferred to grow-out systems, either in ponds or in cages until they reach market size. **a**

- MET ALDON

# FEATURE

## 'A little bit of mucus' is new technique to determine sex of hermaphrodite grouper



One of the giant grouper (*Epinephelus lanceolatus*) in the broodstock cages at the Igang Marine Station. A non-invasive technique developed at SEAFDEC/AQD recently allows for easier determination of giant grouper sex. [PHOTO BY RD DIANALA]



Biopsy of giant grouper is done by inserting a plastic cannula into the genital opening to check for the presence of eggs. [PHOTO BY SEAFDEC/AQD]

BENEATH the turquoise waters of Igang Bay in Guimaras Island dwell one of the most feared species of fish in the Philippines. Indeed, urban legend has it that this brown behemoth fish sprinkled with dark spots, which can grow up to 2.3 meters in length and 400 kilograms in weight, is responsible for several human disappearances.

Fortunately, the monster fishes of Igang Bay are comfortably enclosed in sturdy net cages of the Igang Marine Station of the Southeast Asian Fisheries Development Center (SEAFDEC). The breeding of the giant grouper, *Epinephelus lanceolatus*, the largest species of the delectable fish locally known as *lapu-lapu*, *pugaro*, or *kugtong*, is being closely studied at the station.

A successful breeding program for the giant grouper is hoped to pave the way for the sustainable farming of the sought-after fish commonly eaten steamed, fried, grilled, or stewed in restaurants

and many homes. Indeed the importance of breeding the fish is underlined by the “vulnerable” status of its wild population as listed by the International Union for Conservation of Nature (IUCN).

### Hermaphrodite grouper invites “invasive pokings”

However, a major bottleneck in their breeding is finding out which fish is male, which is female, and which ones are ready to breed. Sexing the grouper periodically is of prime importance because they are hermaphrodites – that is they change sex from male to female at some point in their life.

Previously, the way to determine the sex of the fish was through invasive pokings – technically, cannulation biopsy – into the genital openings of sedated fish to check for eggs using a plastic cannula.

Poking the grouper with a cannula requires skill, causes stress to the fish

and is difficult to perform considering the size of the giant grouper. Recently, a SEAFDEC study devised a new method to determine the sex and maturity of grouper without subjecting them to the painful pokings.

### Researcher finds that “a little bit of mucus” determines grouper’s sex

Apparently, the mucus naturally coating the body of the giant grouper contains the protein called vitellogenin, the presence of which indicates the fish is a female. The new method simply detects the presence, or absence, of the protein to faithfully determine the sex of the fish. Thus, mucus with vitellogenin, female. None, male.

The method is detailed in the paper, “Reproductive development of the threatened giant grouper *Epinephelus lanceolatus*” by SEAFDEC researcher Peter Palma and co-authors published in volume 509 of the *Aquaculture* journal. Their study was funded by

the Australian Centre for International Agricultural Research (ACIAR).

Fortunately, the technique only requires scraping off a bit of grouper mucus to a glass slide. The study has revealed that the mucus collection did not cause any skin lesion on the fish during and after the study.

This new technique is a great relief to the grouper and researchers. Imagine the number of painful pokings the fish would have needed to endure as breeders need to periodically confirm that they have not changed sex. Now, “a little bit of mucus” is all that is needed.

This is another milestone in giant grouper research so that there can be more steamed *lapu-lapu* in oyster sauce without harvesting what remains in the reefs. It turns out the feared giant grouper may have man to thank for saving it from further threat of overfishing, and many painful pokings. **a**

- RD DIANALA



# RESEARCH PRESENTATIONS



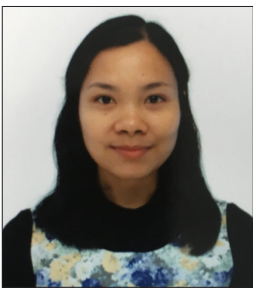
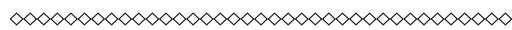
**Mr. Joseph Faisan Jr.**, senior technical assistant at SEAFDEC/AQD, presented his study titled, “Disease and pest assessment on farmed carrageenophytes in Central and Southern Philippines,” on 9 May 2019 in Tigbauan, Iloilo.

According to the study, one of the main causes of seaweed production decline in the Philippines are disease and epiphytic pest outbreaks. Thus, in order to mitigate or prevent losses of the seaweed industry, up-to-date information on seaweed diseases and pests is needed. However, data on the occurrence of these problems at the farm level is limited.

With this, Mr. Faisan’s study assessed the presence of disease and pest infestations in major seaweed producing provinces in the Philippines, namely: Bohol, Davao del Norte, and Tawi-Tawi. The assessment was conducted from October to November 2018 where five percent of the total farmed

seaweeds per site were checked for the presence of disease and pests. Environmental parameters such as pH, temperature, salinity, light intensity, dissolved oxygen, phosphate, nitrite, nitrate, and ammonia levels were also monitored.

The assessment showed that ice-ice disease and epiphytic pests are the most common problems of the farms that were evaluated. With this result, the study recommended to give priority to mitigating strategies such as regular monitoring and the use of disease-free planting materials in order to prevent outbreaks and to minimize losses. [a](#)



**Dr. Iris Ann Borlongan** of Kagoshima University shared her research on “Effects of light quality and temperature on the photosynthesis and pigment content of an edible red alga *Meristotheca papulosa* (Solieriaceae, Gigartinales) from Japan” to SEAFDEC/AQD research staff on 16 May 2019 in Tigbauan, Iloilo.

Dr. Borlongan discussed that *Meristotheca papulosa* is an economically important species of seaweeds in Japan that is used as an ingredient for salads. Thus, laboratory cultivation is an important means of sustaining its production.

The study assessed the effects of different light spectral qualities and temperature on the photosynthesis and pigment content of this alga. Photosynthesis-irradiance experiments were carried out under red, blue, green, and white light at 12, 20, and 28°C, respectively. It was observed that

the maximum net photosynthetic rates were highest under green light. Moreover, the photosynthesis-temperature experiment revealed that the maximum gross photosynthetic rate occurred at 22.1°C, which was within the optimal temperature range of 21.5–23.6°C. Thallus segments were likewise exposed to the different light qualities at 100  $\mu\text{mol photons m}^{-2} \text{s}^{-1}$  for seven days and their chlorophyll-a (chl-a) and phycobiliprotein contents were then analyzed after this period.

The study showed that phycoerythrin (PE) concentration increased when algae were subjected to blue and green light, while chl-a and phycocyanin have little variation in all light qualities. Thus, this study suggested the use of green light to enhance photosynthesis of *M. papulosa*. Furthermore, to achieve a high PE content for an improved reddish-color of the fresh product, exposure to blue or green light is also a good alternative, said Dr. Borlongan. [a](#)

## AQD joins "Month of the Ocean" celebration

SEAFDEC/AQD, led by its museum, FishWorld, joined the “Month of the Ocean” (MOO) celebration by cleaning the coast near its area. The garbage collected were segregated according to their type. Food wrappers, takeout containers, beverage bottles, plastic bags, paper bags and fishing gear were found.

The “Month of the Ocean” is celebrated annually in the Philippines during the month of May. This year is the 20th anniversary of MOO with the theme “Free the sea from marine debris.” [a](#)



FishWorld and Library staff, on-the-job trainees, and an employee's child participate in cleaning the coast near SEAFDEC/AQD.



PHOTOS BY RH LEDESMA/LIBRARY/FISHWORLD

# BFP holds Fire Brigade Training at AQD



SEAFDEC/AQD employees actively participate during the simulation exercises of the Fire Brigade Training. PHOTOS BY JF ALDON

TO INCREASE the awareness of employees on what to do during fire, earthquake, or other emergencies, SEAFDEC/AQD's Human Resource Management Section (HRMS) in coordination with the Bureau of Fire Protection (BFP) of Tigbauan Fire Station facilitated a three-day intensive Fire Brigade Training on 2, 3, and 7 May 2019 at SEAFDEC/AQD Multi-Purpose Hall.

The training is one of the targeted activities of HRMS for 2019 due to the prevailing effect of climate change and workplace incidents caused by human errors. It is also the first time that the Department facilitated this kind of training.

The training was attended by 51 employees who were chosen by their respective division heads based on building assignment, employment status, job relation, residence location, physique, and availability of the employee during the training.

Ms. Sunshine Mae Salonga, HRMS officer-in-charge, thanked the management for the full

support and the participants for their interest in joining the activity during her opening remarks. According to her, the training aimed to benefit not only to the Department but for the participants to apply what they learned in their personal lives and communities as well. She hoped that the participants will be equipped with the necessary knowledge and skills in saving lives.

Throughout the training, the resource speakers/trainers ensured that all participants fully understood all areas of expertise by re-grouping them in several simulation exercises.

On the first day, Senior Fire Officer (SFO) Ardin Cyren Tuante briefly introduced the Fire Safety Services including the BFP's mission and vision, roles and responsibilities of fire volunteers and the organization and responsibility of fire brigade/fire volunteers to BFP. He further lectured on the chemistry of fire, fire alarm and communication system, firefighting safety techniques and procedures, and apparatus and equipment

which includes personal protective equipment, fire hose and nozzles, portable fire extinguishers and ladder. After the theory discussion, SFO Tuante together with his team demonstrated how to use the fire extinguisher, hose, nozzle and ladder during fire emergencies. The participants were grouped randomly and asked to apply what they learned through a series of practical exercises.

The second day focused on the rescue and medical operations which includes basic search and rescue principles, rescue methods and techniques, rope and knot tying, and emergency medical operations/basic life support. The basic first aid was discussed by Fire Inspector Officer 1 (FO1) Jeckyll John Tangente. The demonstration on the different types of carrying and transporting an injured person was led by FO1 Neilix Anthony Tortola and FO1 Ronald Agot while ladder-and-rescue using the stretcher was directed by FO1 Jay-ar Gequiniana. The different kinds of knots, ropes and rescue techniques, and the ladder rescue using triple bowline was initiated by

FO1 Jason Caoyonan with a volunteer youth and the rest of the BFP team.

The last day of the training concentrated on the practical exercises on fundamentals of fire suppression and control, the practices of ventilation and salvage and overhaul. The demonstration was done at SEAFDEC/AQD's apartment area. The fire simulation exercise did not only involve rigorous physical training, but it also challenged the alertness of the mind and the fighting spirit of the participants during life and death situations.

Based on the feedback from the participants, the overall simulation exercises was successful. They found the training very informative and useful as it enabled them to perform complex tasks during emergencies or under life-threatening conditions.

The participants of this training are expected to serve as point persons in mobilizing a combined task force during the conduct of annual drill and/or the actual calamities/incidents, as they happen. **a**

- MB FRANCISCO



# SEAFDEC/AQD scientists bag prestigious awards



SEAFDEC/AQD scientist Dr. Rolando Pakingking Jr. receives the 2019 Dr. Elvira O. Tan Award for Outstanding Published Paper in Aquatic Science Category (left photo) and former SEAFDEC/AQD scientist Dr. Emilia Qunitio receives her award as the 2019 Outstanding Professional in Fisheries/Aquaculture (right photo). PHOTOS COURTESY OF MJHL RAMOS and ET QUNITIO

THREE scientists from SEAFDEC/AQD were recognized for their contributions to aquaculture by prestigious award-giving bodies in the Philippines.

Dr. Rolando Pakingking Jr. together with co-authors Dr. Evelyn Grace de Jesus-Ayson, Ms. Ofelia Reyes and Mr. Norwell Brian Bautista won the 2019 Dr. Elvira O. Tan Award for Outstanding Published Paper in Aquatic Science Category for their paper “Immunization regimen in Asian sea bass (*Lates calcarifer*) broodfish: A practical strategy to control

vertical transmission of nervous necrosis virus during seed production.”

The authors received their award during the S&T Awards and Recognition Ceremony of the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development of the Department of Science and Technology (DOST-PCAARRD) on 19 June 2019 at the Philippine International Convention Center, Pasay City, Philippines.

The Dr. Elvira O. Tan Award pays tribute to Filipino

scientists and researchers for their exceptional publication of research and development results, which support the mission of DOST-PCAARRD to advance the country’s national economic and food security.

On the other hand, SEAFDEC/AQD scientist Dr. Frolan Aya is the recipient of the Outstanding Young Scientist Award in the field of aquaculture and nutrition. This award is given by the Philippines’ National Academy of Science and Technology to acknowledge the significant contributions

of young scientists in science and technology. Dr. Aya will receive his award on 11 July 2019.

And finally, former AQD scientist Dr. Emilia Qunitio was recognized as the 2019 Outstanding Professional in Fisheries/Aquaculture by the Philippines’ Professional Regulation Commission during the 2019 Outstanding Professionals Awards Night which was held at the Fiesta Pavilion, Manila Hotel on 20 June 2019. **a**

- RH LEDESMA

## Health is wealth!

To promote health awareness among SEAFDEC/AQD employees, the Human Resource Management Section organized a seminar titled, "Burden of Pneumococcal Disease in a Work Place" on 30 May 2019.

Resource speaker Dr. Tomas T. Saiton Jr., a specialist on infectious diseases of the Department of Health, talked about pneumococcal diseases such as pneumonia and meningococemia. 55 SEAFDEC/AQD employees attended Dr. Saiton’s talk. **a**



SEAFDEC/AQD Administration and Finance Division head Ms. Amelita Subosa (left) and Human Resource Management Section OIC Ms. Sunshine Mae Salonga (right) give a Certificate of Appreciation and token to Dr. Tomas T. Saiton Jr. PHOTO BY YS SALVILLA



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