



ONE OF THE BEST IN THE WORLD.
Fijians scanned the globe in search for an institution where they can learn the culture of sandfish, a prized commodity, only to find it in SEAFDEC Aquaculture Department. See full story in Page 7. *PHOTO BY JF ALDON*

aqd matters

March-April 2019

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

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AQD hosts back-to-back eel workshops



PHOTO COURTESY OF MLC APALAR

Participants from member countries gather during the back-to-back eel workshops last 23-25 April 2019 in Manila, Philippines

SEAFDEC/AQD hosted the back-to-back workshops “Statistics of Tropical Anguillid Eel in Southeast Asia” on 23 April 2019 and “Aquaculture of Tropical Anguillid Eel in Southeast Asia” on 24-25 April 2019 in Alabang, Metro Manila, Philippines.

The workshop was attended by country representatives from

Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Thailand, Viet Nam, and the Philippines. Japanese participants represented JANUS, a consulting firm involved in the project. Resource persons were also invited to present on various topics. Eel farmers from Indonesia, Vietnam and the Philippines were present

during the aquaculture workshop.

The workshops aimed at presenting the output of the first phase of the Japan-ASEAN Integration Fund (JAIF) supported project on “Enhancing Sustainable Utilization and Management scheme of Tropical Anguillid Eel Resources in Southeast Asia” which officially started in August 2017.



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Continued on next page...



SEAFDEC deputy secretary-general Mr. Akito Sato [left] opens the workshop on aquaculture of tropical anguillid eels and AQD chief Dan Baliao [right] shares the insights he gained during the three-day workshop



Participants from SEAFDEC/AQD present their studies. [Left-right] Dr. Aralar, Dr. Aya, Mr. Logronio, and Dr. Eguia

Statistics of Tropical Anguillid Eel in Southeast Asia last 23 April 2019

The first workshop included presentations on the status, utilization, management, and trade of tropical anguillid eels. The ecology of the eels' inshore migration was also presented as well as the results of a study on the genetic connectivity of eels in Southeast Asia.

Based on the presentations and discussions, a lot of work is still needed to fully capture the status of tropical anguillid eel fisheries and its utilizations. Harmonization of fisheries data, particularly on anguillid capture and trade is needed to fully understand the dynamics of tropical anguillid eels and to better conserve and manage remaining stocks.

It is also important to determine if the populations of different species of anguillids common to some ASEAN countries belong to a single stock or not to determine if a joint or separate management

initiatives are needed for such species: e.g. *Anguilla bicolor pacifica*, *A. bicolor bicolor*, and *A. marmorata*.

Aquaculture of Tropical Anguillid Eel in Southeast Asia last 24 to 25 April 2019

The second workshop saw representatives from the Philippines, Indonesia and Viet Nam present on

the status of anguillid eel aquaculture in their respective countries. Dr. Maria Lourdes Aralar, AQD retired scientist, presented Observations and Perspectives on Anguillid Eel Culture in Japan, based on a benchmarking and survey trip to Japan, specifically farms, processing plant and research institutions involved in Anguillid eel.

Dr. Aralar also presented the results of the Eel Aquaculture Survey in the Philippines; Dr. Frolan Aya, scientist, presented on the Nursery Rearing Trials of Philippines Anguillid Eels; Mr. Dan Joseph Logronio, senior technical assistant, presented on Diseases of Eel in Aquaculture/Health management; and Dr. Maria Rowena R. Eguia, scientist, on Morphometric and Genetic Identification of Glass Eel Species Used in Aquaculture.

The final activity of the workshop was the launching and distribution of AQD's Aquaculture Extension Manual (No. 65) entitled "Nursery Culture of Tropical Anguillid Eels in the Philippines" authored by Dr. Aralar, Dr. Aya, Dr. Eguia and Mr. Logronio.

In the discussions, scarcity of anguillid glass eels,

particularly of the desired species *A. bicolor pacifica* in the Philippines was raised as one of the problems of the industry. Despite difficulty (as shown by Japan's experience) in breeding the genus in captivity, ASEAN member states that value the species were called to start investing in research on the breeding of the species found in their country.

SEAFDEC/AQD Chief Mr. Dan Baliao gave the closing remarks for the workshop with some insights he gained from the back to back workshops.

On the last day of the workshop, Mr. Richard Sorita, an eel farmer and also an attendee to the workshop, hosted the participants in a field trip to his farm, SMO Pacific Trading in Calaca, Batangas.

These back to back workshops covered the first phase of the JAIF project on tropical anguillid eels and is due to end July 2019. A second phase of the JAIF project on tropical anguillid eels is currently in preparation with activities and tasks still to be finalized, based on the outcome of the current project. **a**

-MLC ARALAR / RD DIANALA

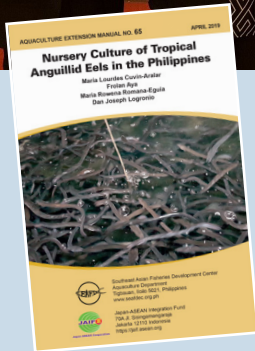
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Participants visit a private eel farm in Calaca, Batangas

AQD launches manual on Nursery Culture of Tropical Anguillid Eels

PHOTO COURTESY OF MLC ARALAR



[Left-right] Authors Mr. Logronio, Dr. Eguia, Dr. Aralar, and Dr. Aya pose with the newest addition to AQD's Aquaculture Extension Manual Series entitled Nursery Culture of Tropical Anguillid Eels [inset]

A 37-page manual on Nursery Culture of Tropical Anguillid Eels was launched last 25 April 2019 during the Workshop on Aquaculture of Tropical Anguillid eel in Southeast Asia. The manual, published by SEAFDEC/AQD, was written by Dr. Maria Lourdes Aralar, Dr. Frolan Aya, Dr. Maria Rowena Romana-Eguia, and Mr. Dan Joseph Logronio.

The manual documents the on-farm practices of eight anguillid eel farms surveyed in the Philippines. Species identification and health management approaches have also been documented.

Rearing trials were also conducted at SEAFDEC/AQD to generate techniques to improve the growth and survival of glass eels.

In his foreword, SEAFDEC/AQD chief Dan Baliao said that he hopes "that more efficient nursery practices will improve the income of local eel farmers and ease some of the pressure on wild stocks."

"Along with the proper management of wild anguillids, SEAFDEC/AQD looks forward to the further development of eel aquaculture towards a truly sustainable industry," he added.

The manual will soon be available for sale at the AQD Bookstore (bookstore@seafdec.org.ph) or (63) 33-3307031. [a](#)

- RD DIANALA / JM DELA CRUZ

Genetic research in the PH reported in Japan

SENDAI, Japan – Dr. Maria Rowena Eguia, scientist of SEAFDEC Aquaculture Department, reported on the genetic research initiatives being done in the Philippines towards sustainable aquaculture at the 16th International Symposium on Integrated Field Science in Tohoku University last 22 March 2019.

Her paper highlighted the local genetic applications for commodities such as tilapia, mangrove crab, shrimp, milkfish and abalone. She likewise discussed the significance of genetic interventions to boost and sustain aquaculture production.

According to her presentation, the production of fish in recent years had declined mainly due to lack of quality seedstocks, limited stocks of captive breeders or spawners, adverse effects

of climate change and other environmental factors, fish diseases, and prohibitive cost of aquaculture inputs such as feeds.

Dr. Eguia cited that genetic researches in the Philippines were conducted, mainly through local grants, with the goal of addressing these constraints. Such initiatives focused on developing and applying methods in selective breeding; marker-assisted genetic strain assessment for broodstock development and for monitoring of inbreeding in farmed stocks; and genomics to enhance on-farm stock performance through the identification of genes that are responsible for nutrition, stress and immune responses, among others.

Dr. Eguia was one of the seven speakers who presented during the symposium. [a](#)

- JM DELA CRUZ

PHOTO COURTESY OF MRR EGUIA



Dr. Eguia receives a certificate of presentation from Dr. Minoru Ikeda, symposium host and associate professor of Tohoku University

Guidelines to efficiently respond to aquatic outbreaks developed



PHOTOS COURTESY OF SEAFDEC/SEC

Chiefs and Deputy Chiefs of all SEAFDEC Departments gather for the 51st Council Meeting in Surabaya, East Java, Indonesia

SURABAYA, Indonesia – In order for stakeholders and competent authorities to respond more effectively to aquatic disease emergencies, the Regional Technical Guidelines on Early Warning System for Aquatic Animal Health Emergencies was developed by ASEAN Member States (AMSs), SEAFDEC Aquaculture Department and other partner organizations.

"These guidelines were developed in response to the ASEAN's need to develop a uniform early warning system for aquatic diseases in the region," said AQD Chief Dan Balião during his presentation at the 51st Meeting of the SEAFDEC Council last 18-22 March 2019. The guidelines were presented as part of AQD's priority project for 2019.

The scope of the guidelines includes proper actions to be undertaken by AMSs in case of the occurrence of known, unknown, existing, emerging, and/or re-emerging diseases. Key players were also identified in aquatic emergency preparedness and response system including their roles and responsibilities.

Chief Dan mentioned that this will maximize the efficiency of response to serious outbreaks of aquatic animal diseases which may affect the region's economy.

The 'guidelines' will have to pass through SEAFDEC Council Director and Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership for endorsement which allows its presentation to higher ASEAN meetings. This will eventually lead to its dissemination and distribution to AMSs.

Contents of the guidelines were created through the assessment of AMSs' existing laws, legislation, standard operating procedures, strategies, and other initiatives pertinent to aquatic animal health and disease management. The drafting committee includes all participants who attended and contributed at the ASEAN Regional Technical Consultation on Aquatic Emergency Preparedness and Response System for Effective Management of Transboundary Disease Outbreaks in Southeast Asia held last 20-22 August 2018



AQD Deputy Chief Dr. Koh-ichiro Mori and Chief Dan Balião represent SEAFDEC/AQD during the 51st Council Meeting

in Bangkok, Thailand. The project was in partnership with the Department of Fisheries – Thailand, ASEAN Network of Aquatic Animal Health Centers, and Network

of Aquaculture Centers in Asia-Pacific and was funded by Japan-ASEAN Integrated Fund. [a](#)

- JM DE LA CRUZ

AQD programs endorsed by the SEAFDEC Council

Activities, implemented by AQD under its regional and departmental programs, were reported by SEAFDEC Secretary General Dr. Kom Silapajarn as part of his presentation containing all the accomplishments of each department for 2018 during the 51st Meeting of the SEAFDEC Council in Surabaya, Indonesia.

Dr. Silapajarn reported the progress of 47 studies by AQD which involve

research, verification and demonstration of aquaculture technologies in the priority areas of broodstock development and seed production, farming systems and ecology, nutrition and feed development, fish health management, and socioeconomics.

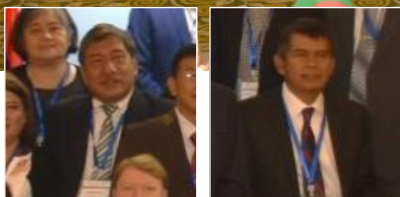
All progress including AQD's plans for 2019 were endorsed by the SEAFDEC Council Directors. [a](#)

- JM DE LA CRUZ

Chief attends NACA Governing Council meeting held in China



SEAFDEC/AQD Chief Dan Baliao and BFAR Director Eduardo Gongona (inset) attends the NACA's 30th Governing Council Meeting together with participants from other Asia-Pacific Region Countries



GUANGZHOU, China
- SEAFDEC/AQD Chief Dan Baliao attended the Network Aquaculture Centres in Asia Pacific's (NACA) 30th Governing Council Meeting to discuss the major accomplishments of its member countries for 2018 last 26-28 March 2019.

SEAFDEC/AQD's projects and accomplishments, made in collaboration with NACA, were reported by the Chief during the meeting. The department is one of NACA's Regional Lead Centers in Asia and the partnership between the two organizations started in 1980.

One of the most notable collaborations is the thrust on aquatic animal health especially the development

of an early warning system. It was noted that the system has been useful in recognizing emerging and re-emerging aquatic animal diseases in the region. The World Organisation for Animal Health and Food and Agriculture Organization of the United Nations (FAO) were mentioned for their contributed to the said project.

Bureau of Fisheries and Aquatic Resources Undersecretary Commodore Eduardo Gongona was also present during the meeting to represent the Philippines' and show its continued support to NACA and its projects.

Aside from SEAFDEC/AQD projects, accomplishment and future

plans of other regional lead centers were also discussed.

In terms of sustainable farming systems, the representative of Thailand reported the result of their study on sustainable marine shrimp culture using a recirculating system. As a recommendation, a pilot study on its commercialization using Polyethylene Canvas Pond in Thailand was proposed and to be funded by the Agricultural Research and Development Agency.

With regards to the emerging global issues on climate change, a new paradigm on planting mangrove for integrated multiple benefits was proposed to the meeting.

This was based on a Letter of Agreement signed with FAO in 2017 to provide service to address the implication of climate change on aquaculture.

The topic of gender issues was given ample time for discussion, as there were eighteen proposals submitted. Only five were assessed to be suitable for funding based on the criteria established. Countries involved were India, Maldives, Vietnam, Cambodia, and Iran.

Other relevant topics discussed were: food safety, quality and certification; education and training; genetics and biodiversity; and information and communication. [a](#)

-MET ALDON/JM DE LA CRUZ

Grouper studies shine at 12AFAF

With the theme of transforming Asian fisheries and aquaculture for sustainable production and nutrition, the 12th Asian Fisheries and Aquaculture Forum (12AFAF) was conducted to update stakeholders on the recent trends in the industry at the Iloilo Convention Center in Iloilo City last 8-12 April 2019.

Fisheries and aquaculture scientists, researchers, managers, and practitioners from around the world graced the international gathering including representatives from SEAFDEC/AQD.

Genetic biotechnology

One of AQD's representatives Mr. Peter Palma, researcher, presented his paper entitled "Studies towards Advancing Reproductive Development in Giant Grouper *Epinephelus lanceolatus* using Recombinant Hormone Manipulations" during the session on genetics biotechnology.

Mr. Palma's research aims to use recombinant hormone manipulation to induce groupers' sexual maturation. This is to address the issue of low productivity of the animals caused by late sexual maturity. Results did not only show how effective the hormone is to groupers' sexual maturity but it modulated the process of sex reversal either through intermuscular or oral administration.

Mr. Palma was one of the awardees of Best Student Research Presentation (postgraduate level).

Fishery biology

Ms. Josielou Chan, technical assistant, also presented her research on "Reproductive Development of the Threatened Giant Grouper *E.*



Ms. Chan and Mr. Palma together with marine fish commodity leader Dr. Evelyn Grace Ayson during the 12AFAF at Iloilo City

lanceolatus." Her study aims to verify the long-standing hypothesis which says that giant groupers follow the reproductive patterns of most Epinephelines that were characterized by protogynous hermaphroditism wherein male maturation is attained through sex reversal of a functional female. This hypothesis has not been verified due to a lack of

biological data and this study will provide information to address this gap.

Findings, however, deviate from the previous hypothesis and rather suggests that giant grouper is a diandric protogynous hermaphrodite. This study provides novel information on the reproductive biology of giant grouper which will be useful in the development

of effective captive breeding technology as well as strategic population management of this economically important and vulnerable species.

The 12AFAF was organized by Asian Fisheries Society (AFS) in partnership with the University of the Philippines Visayas and the University of the Philippines Visayas Foundation, Inc. [a](#)

- JM DE LA CRUZ

AFAF delegates visit SEAFDEC/AQD



Delegates visit AQD's milkfish (above) and abalone (right) hatcheries



PHOTOS BY DEVCOM / JF ALDON

SEAFDEC/AQD was one of the field trip destinations visited by participants of the 12th Asian Fisheries and Aquaculture Forum (12AFAF) last 12 April 2018. Delegates visited AQD's facilities including abalone and milkfish hatcheries.

AFAF is a conference that showcases recent advances in fisheries and aquaculture research and development in Asia. Scientists, researchers, managers, and practitioners from different parts of the world attend the forum to discuss the industry's regional priorities, common problems, and research findings. [a](#)

- JM DE LA CRUZ

Partnership inked for coastal resource enhancement project at Lahuy Islands

To rehabilitate the degraded coastal resources and reduce stress to the marine ecosystem in Caramoan, Camarines Sur, the Partido State University (PSU) partnered with SEAFDEC/AQD for the implementation of a resource enhancement project at the Lahuy Group of Islands.

The two institutions sealed their partnership on 11 April 2019 through an agreement signing held at SEAFDEC/

AQD's Tigbauan Main Station in Iloilo, Philippines.

The collaborative research project will involve socioeconomic and resource assessment; social and biophysical preparation of the enhancement site; and stock enhancement of abalone and sandfish, if proven suitable in the area.

Prior to the agreement signing, the Lahuy Group of Islands in Caramoan

has been considered as a replication site adopting the strategies of the successful Community-Based Resource Enhancement (CBRE) project of SEAFDEC/AQD and the Government of Japan-Trust Fund 6 in Molocaboc, Sagay City, Negros Occidental. The Caramoan site was evaluated in a preliminary social assessment conducted by PSU and SEAFDEC/AQD in May 2017 together with the local stakeholders.

With SEAFDEC/AQD's experience, it will be in-charge of providing technical advice based on the CBRE project in Sagay. SEAFDEC/AQD's researchers and technical team in-charge of the project will also participate in some field activities at the site and in fisherfolk community meetings in Lahuy Island. **a**

- RH LEDESMA

PHOTO BY DEVCOM / JF ALDON



Representatives from Partido State University and SEAFDEC/AQD seal their partnership during a signing ceremony last 11 April 2019

AQD extends agreement with KESI for another 20 years

SEAFDEC/AQD inked an agreement with Kinaadman Elementary School, Inc. (KESI) on 6 March 2019 at SEAFDEC/AQD's main station in Tigbauan, Iloilo which allows the school to continue its operation within the SEAFDEC/AQD compound for another 20 years beginning 1 June 2021.

SEAFDEC/AQD was represented by its chief Mr. Dan Baliao and Administration and Finance Division Head Ms. Amelita Subosa while Kinaadman Elementary School, Inc. (KESI) was represented by Ms. Jennifer Hope Tueres,



PHOTO BY DEVCOM / JF ALDON

Representatives of SEAFDEC/AQD and KESI seal the agreement with a handshake last 6 March 2019

president of the KESI Board of Trustees and Mr. Edmundo Escobañez, principal of KESI. The other members of the

KESI Board of Trustees were also present to witness the signing of the agreement. **a**

- RH LEDESMA

Fijians choose SEAFDEC/AQD as training ground for sandfish culture

Aiming to start a small-scale commercial sandfish hatchery, three Fijians searched the world over and found the platform they needed for learning the culture of the prized commodity at SEAFDEC/AQD in Iloilo, Philippines.

“We scan around the globe to see which among the

institutions that can provide us the needed information and the skills required for us to succeed in our ventures. So we selected to attend the SEAFDEC/AQD training program...” said Solomoni Suguta, one of the trainees from Fiji.

He shared their high hopes that the “baskets” of

expectations they brought will be filled when they return to their respective countries.

“Indeed, our baskets were full with the 16-day training. Thank you so much [to] all the technical team for the practical skills, the lectures, the theories... we are so privileged to be attending the course,” said Suguta.

The trainees from Fiji, together with other participants from Papua New Guinea (1), and the Philippines (2), attended SEAFDEC/AQD’s 16-day training course titled “Sandfish (*Holothuria scabra*) Seed Production, Nursery and Management” held at Tigbauan Main Station in Iloilo, Philippines on 25 March-8 April 2019.

The training course covered lectures and practical activities on natural food culture, sandfish spawning induction, and larval rearing. The course also included field tours to nursery culture sites and sandfish sea ranching sites. Grow-out culture and sandfish processing were taken up as well during the course. [a](#)

- DEVCOM



PHOTO BY DEVCOM / JF ALDON

Trainees learn to monitor sandfish in nursery pens at the Igang Marine Station

Philippine aquaculturists train on feeding management

In preparation for a national feed development program which will be conducted between AQD, the Bureau of Fisheries and Aquatic Resources (BFAR), and the National Fisheries Research and Development Institute (NFRDI), 21 aquaculturists from different Philippine regions attended a training course on Feeds and Feeding Management on 26 February to 5 March 2019.

Dr. Joseph Christopher Rayos, OIC of the Fish and Nutrition Section of NFRDI said that the collaborative project will be conducted this year and next year and the training is meant to help them in the supervision and implementation of the project.

Dr. Lydia Morales, head of Fish Nutrition Section of BFAR in Muñoz, Nueva Ecija Province, said the feed development project is ultimately meant to help farmers lower their costs for

feeds, particularly for milkfish and tilapia. At present 50 to 70% of the cost of aquaculture is attributed to feeds.

Meanwhile, Dr. Rayos said that just like the trainings they received from other

SEAFDEC departments, TD and MFRDMD, the resource persons were very knowledgeable in the topics and the staff are experienced in dealing with people and handling visitors. [a](#)

- DEVCOM



Trainees at the AQD feed mill observing the feed preparation procedures

PHOTO BY DEVCOM / RD DIANALA

Neglected leaves may revolutionize aquaculture



Terminalia catappa leaves hold promise to solve fundamental problems in aquaculture

Broad red leaves litter the driveway at the Southeast Asian Fisheries Development Center (SEAFDEC) in Tigbauan, Iloilo during the dry season. Months earlier, the leaves were a brilliant green before turning into shades of yellow, orange and red before falling away from the tall talisay trees lined up along the road.

Groundsmen armed with a leaf blower and broomsticks promptly gather the leaves for disposal early every morning. Their office says the leaves are dumped in one place if not buried. Not too many people know that these dried talisay leaves scattered around the Aquaculture Department of SEAFDEC hold almost magical properties that can solve fundamental problems in the aquaculture industry.

The leaves of the common talisay, also known as the Indian or tropical almond tree, are rich in tannins and a host of organic compounds that conditions the water and improve the survival

and health of various aquatic species.

Recently, SEAFDEC/AQD scientist Dr. Frolan Aya, demonstrated that simply littering hatchery tanks with talisay leaves significantly improves the survival of the larvae of ayungin, or silver tharapon, *Leiopotherapon plumbeus*.

The leaves, which were simply added and allowed to decompose in the culture tanks, resulted in a 48% survival of ayungin larvae. Meanwhile, those without the leaf substrate only achieved a 27% survival rate.

Dr. Aya's study is published in the 66th volume of the journal *Ichthyological Research* published this 2019. His co-authors are Ms. Vicar Stella Nillasca, Ms. Mary Jane Sayco and Dr. Luis Maria Garcia.

The study supposed that the presence of the leaf litter allowed small organisms, such as zooplankton and insect larvae, to colonize the leaf surfaces. These organisms

soon became food for the ayungin larvae. It might have also been possible that the accumulation of leaves at the tank bottom reduced water motion and allowed the larvae to conserve their energy instead of going against the flow of current.

"The darkening of the rearing lake water may also provide a good background or contrast for the larvae to efficiently capture its prey, thus contributing to better feeding success and consequently significantly improved larval survival in the present study," the paper added, noting the decomposing leaves caused the water to darken.

Indeed, previous studies have shown that the mere presence of leaf litter in culture tanks presents some advantages to improve fish survival. However, other studies using only extracts of the talisay leaf, without the litter, have shown significant improvements in the survival of fish and even tiger shrimp, *Penaeus monodon*.

"Aqueous extract of tropical almond leaves are known to contain tannins known to enhance water quality by reducing pH and TAN levels," the paper said. Further, other studies have shown that talisay leaf extracts also possess antimicrobial and antifungal properties due to the presence of an array of beneficial organic compounds.

Placing dried talisay leaves in culture tanks appears to provide both the physical benefit of a leaf litter substrate as well as the leaching of desirable organic chemicals to the rearing water. While the method seems simple, more study is still needed, especially on new applications.

Perhaps, soon, the broad red leaves littering the SEAFDEC driveway will be no more. They will all be stashed away in hatcheries and laboratories, no longer neglected, because of their almost magical properties. **a**

- RD DIANALA

JICA Cambodia send MARDeC staff to AQD for aquaculture training



Trainees from the Marine Aquaculture Research Development Center (Cambodia) who trained at AQD on grouper culture and fish health management

To boost the marine aquaculture industry in Cambodia, the Japan International Cooperation Agency (JICA) funded four Cambodian technical staff to train on the culture of grouper and fish health management at AQD from 4 February to 1 March 2019.

Oem Ramana and Ao Veasna trained on grouper

culture while Mey Sothea and Tey Teong trained on fish health management. They are all from the Marine Aquaculture Research Development Center (MARDeC) in Preah Sihanouk, Cambodia which was established in 2012, also with JICA assistance.

The trainees said marine aquaculture in Cambodia

only started recently, in 1993, beginning with small net cages. However, the lack of technical information and knowledge led them to seek training.

“That’s why we are here, we try to boost our marine aquaculture techniques, do an extension to the farmers, and also try to eliminate importing from the

neighboring countries like Thailand and Vietnam,” Ao Veasna said.

Ao also shared that while MARDeC is already producing seabass fingerlings, they are aiming to extend work to other species such as grouper. Their training covered lectures and practical sessions on the biology, ecology, and culture of grouper, including seed production, natural food culture, feed preparation and feed management. Grouper broodstock sampling at the Igang Marine Station was also done.

Meanwhile, Mey and Tey underwent training on aquatic diseases including necropsy, virology, bacteriology, mycology, and parasitology. Histopathology and other microbiological techniques were also covered by the training course.

Future plans

With regards to fish disease, Ao Veasna shared their limitation on the techniques, materials, and equipment to diagnose, as well as process samples in MARDeC. He plans to propose to their superior and partners to support them in establishing a well-equipped laboratory.

For seed production, their target is to expand to more fish species including pompano, siganid, milkfish and mullet. In addition, they plan to set up biosecurity measures in their hatchery and laboratory.

“Cambodia is also one of the members of SEAFDEC, but we still have limited capacity in the marine hatchery, and also for the freshwater. We are looking forward to collaborating with SEAFDEC and other development partners to implement a project, and also conduct research and share knowledge,” Ao said. [a](#)

- DEVCOM

Aimeliik State Gov visits AQD’s mangrove crab hatchery



PHOTO BY DEVCOM / JM DELA CRUZ

Ms. Joana Joy Huervana, associate researcher and mangrove crab expert from SEAFDEC/AQD, shows a mangrove crab spawner to Governor Obak

SEAFDEC/AQD is one of the stops visited by Mr. Demei Obak, governor of the State of Aimeliik, during his fisheries-related tour around Iloilo last 8 April 2019.

The governor expressed his interest on the farming systems used by AQD to culture mangrove crabs and other fish commodities. The goal of his visit is to bring the technical knowledge he learned from the experts

back to his State to help his constituents start their own tank farms.

Aimeliik is a state of Republic of Palau, an island country located in the western Pacific Ocean. [a](#)

- JM DE LA CRUZ

Australian Deputy Head of Mission visits ACIAR-funded studies



Mr. Mat Kimberly (leftmost), deputy head of mission of the Australian Embassy in the Philippines, interacts with a sandfish breeder shown to him by Dr. Jon Altamirano (third from left.) With them are Ms. Mai Alagcan (second from right), ACIAR Philippines country manager and Ms. Jasmine Valcic (rightmost) of Austrade

Mat Kimberly, deputy head of mission of the Australian Embassy in the Philippines, visited SEAFDEC/AQD facilities to see the ongoing studies on grouper and sandfish which are funded by the Australian Centre for International Agricultural Research (ACIAR).

Kimberley, with his delegation from ACIAR and the Australian Embassy, toured the Igang Marine Station and the Tigbauan Main Station last 10 and 11 April. They were briefed on the research activities by Dr. Jon Altamirano and Dr. Evelyn Grace Ayson, study

leaders of the sandfish and grouper studies.

“Really, really impressive. The research that’s going on here across all aspects that we’ve seen this afternoon shows what can be done with good cooperation and good research and with a good understanding of the

communities and the value chains,” said Kimberley after his tour.

This year, ACIAR is supporting the study on “Breeding and seed production of giant grouper (*Epinephelus lanceolatus*)” and “Increasing technical skills supporting community-based sea cucumber production in Vietnam and the Philippines.”

“I think the partnership has stood the test of time and it has been going for quite a while. I think it shows what real positive can come from [deep] institutional and personal linkages, so a continuing partnership between Australia and the Philippines here is an example of what the two countries can do,” he added.

Kimberley was with Ms. Mai Alagcan, ACIAR country manager (Philippines), Ms. Mariel Eduarte, media and public affairs manager of the Australian Embassy in the Philippines, and Ms. Jasmine Valcic of Austrade. **a**

- DEVCOM

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Mr. Mat Kimberly (leftmost) closely inspects the grouper breeders in the Igang Marine Station floating cages

Chinese Universities pay a courtesy call on the AQD Chief



PHOTO BY DEVCOM / FJ ALDON

Eighteen professors and researchers from the Ocean University of China, Sun Yat-sen University, and Shanghai University were at SEAFDEC/AQD's Tigbauan Main Station in Iloilo, Philippines on 11 April 2019 to meet with SEAFDEC/AQD chief Dan Baliao. SEAFDEC/AQD's Research Division head Dr. Leobert de la Peña and Training and Information Division head Dr. Edgar Amar were also present during the courtesy call.

SSS orients employees on its recent programs



Mr. Casaquite, SSS account officer for VISMIN Large Account Department, receives a certificate from AFD head Ms. Amelita Subosa and HRMS head Ms. Sunshine Salonga

To update the employees on recent developments and programs of Social Security System (SSS), an orientation was conducted by SSS representative Mr. Rey Mark Casaquite last 8 April 2018 at SEAFDEC/AQD's Multi-purpose Hall.

The orientation covered basic information about the

mandatory social insurance scheme for SEAFDEC/AQD employees. Benefits, contributions, payment collections and other important matters were discussed.

This event was sponsored by the AQD's Human Resource Management Section.

University of Gothenburg eyes future collaboration with AQD



PHOTO BY DEVCOM / FJ ALDON

The University of Gothenburg represented by Dr. Alyssa Joyce had an exploratory meeting with SEAFDEC/AQD for a possible research collaboration. The meeting was held at SEAFDEC/AQD's Tigbauan Main Station in Iloilo, Philippines on 11 April 2019. SEAFDEC/AQD officers present during the meeting were the Chief Dan Baliao, Research Division head Dr. Leobert de la Peña, and Nutrition and Feed Development Section head Dr. Roger Edward Mamaug

PHOTOS BY DEVCOM / RD DIANALA



AQD employees and the speaker, Mr. Casaquite, during the SSS seminar last 8 April 2019

BORN TO BE A SCIENTIST: *from Engineering to Fisheries*

Coming from a family of scientists – from his grandfather, both parents and brother – Dr. Masashi Kodama, a researcher from Japan International Research Center for Agricultural Sciences (JIRCAS), also became one.

“When I was in high school, I thought I have no choice. I have to become a researcher in any field but I didn’t want to follow my family, they’re biologists, either in the academe or the medical field. I went to a different direction, I tried to get far from my family and thought civil engineering is the farthest but turned out, I am doing fisheries which belongs to biology, it’s funny, I realized you cannot fight blood,” he narrated.

Dr. Kodama obtained his Ph.D. in Engineering in February 2003 under the Department of Earth System Science and Technology,



Dr. Kodama during SEAFDEC/AQD Anniversary Main Program in July 2016

Interdisciplinary Graduate School of Engineering Sciences, Kyushu University.

“My family’s origin is Hiroshima. In 1945, Hiroshima City was destroyed by an atomic bomb, and since my grandfather (mother’s side) was a medical doctor, he volunteered to do medical care. He’s also a scientist, so he

examined data collected from his patients and then assessed the impact of atomic bomb to human body in relationship with the distance from the hypocenter.”

“I find it interesting, my first work here (SEAFDEC/ AQD) was about environmental impact of milkfish culture. I plotted the

sediment quality to evaluate the impact from the center of feed guard along a transect. I also did similar work in Fukushima from 2011 to 2013 after the Fukushima nuclear disaster. This was to assess impact of radiation leakage from the nuclear power plant, so it’s very similar work with

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SUGITA-SAN: *I want you to remember me when eating takoyaki*

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One of Dr. Sugita’s candid moments in the halls of SEAFDEC/AQD

Dr. Tsuyoshi Sugita, a Senior Researcher of Japan International Research Center for Agricultural Sciences (JIRCAS), has been known as a friendly and funny Japanese scientist to his colleagues at SEAFDEC/AQD.

Coming from Osaka, Japan, he introduced the original takoyaki, or Japanese octopus balls, to his Filipino colleagues. Variants of this snack have become a favorite during small gatherings at his house.

“I want you to remember me when eating takoyaki,” he said.

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BORN TO BE A SCIENTIST

my grandfather. Maybe I was born to be a scientist,” he recollected.

Not everybody knows this, but Dr. Kodama worked with SEAFDEC for almost 10 years. He first visited the Philippines in the year 2010 to work as an external consultant for an environmental study in SEAFDEC/AQD, working with Dr. Satoshi Watanabe. Back then, he was still based in the Fisheries Research Agency (FRA) in Japan and was only visiting as a consultant.

Four years later, he worked as a Senior Researcher of the Japan International Research Center for Agricultural Sciences (JIRCAS) based in SEAFDEC/AQD (2014-2019).

He took over Dr. Watanabe's work on Integrated Multi-Trophic Aquaculture (IMTA) and established an on-farm experiment on the field, as a visiting scientist.

“Some people call me that I am Filipinized – Japanese and I'm proud because it means that I have blended well with the Filipino culture” he added.

In April 2019, he will return to Japan and work as a research coordinator in FRA.

“For my future, I'll just go with the flow. I am always joking that I'll be director general after 15 years and then improve the situation of the research institution, to contribute to the fisheries sector, and also to encourage young people, that's half-serious,” he said. **a**

- DEVCOM

SUGITA-SAN

He is quite a good cook of Japanese dishes. In addition, he is also a good eater of Filipino foods - he loves barbeque, isaw, lechon manok (which he calls rolling chicken), and well, Philippine beer.

Dr. Sugita, fondly called Sugita-san in SEAFDEC, has officially returned to his home country after five and a half years of conducting research in the Philippines as a visiting scientist. With his expertise on fish nutrition and fish physiology, he had successfully developed an alternative fish meal feed for milkfish.

“I will miss everybody's smile, beer, rolling chicken, and isaw. I will never forget your kindness. Thank you very much,” Sugita-san exclaimed.

He will transfer from JIRCAS to Fisheries Research Agency (FRA) this April 2019 and will be based in Hiroshima, Japan for his next research venture. Coincidentally, this new project will focus on the culture of octopus- the main ingredient of his takoyaki snack.

“It's not a joke, my study is about octopus aquaculture. Now the octopus price in Japan is increasing. Most Filipinos do not eat octopus, but now in Japan, the octopus is almost imported from Mauritania, while 10 or 20 years ago, from Morocco. Octopus aquaculture is very difficult, it's not yet completely successful,” Sugita-san humorously explained. **a**

- DEVCOM

Incoming and outgoing JIRCAS experts discuss their research

PHOTO BY CC PILOTON



Incoming Visiting Scientist Dr. Ryogen Nambu receives his certificate of appreciation from Dr. Rolando Platon, culture systems specialist

Japan International Research Center for Agricultural Sciences (JIRCAS) has appointed a new researcher to be based in SEAFDEC/AQD starting from April 2019. Dr. Ryogen Nambu will succeed Dr. Masashi Kodama who worked in AQD since 2014 as a visiting scientist.

On 19 March, the two Japanese experts gave a back-to-back seminar held at the RD-AVR at the Tigbauan Main Station. Dr. Nambu presented his two case studies in Japan, focusing on the relationship between artificial fisheries and environment, while Dr. Kodama discussed the progress of his Integrated Multi-Trophic Aquaculture (IMTA) study in SEAFDEC/AQD.

Study on the relationships between artificial fisheries development and environment: Case studies in Japan

As a Senior Researcher at the National Research Institute of Fisheries Engineering (NRIFE), Japan Fisheries Research and Education Agency, Dr. Nambu introduced two case studies: (1) Evaluation of artificial reefs in increasing primary production in the Sea of Kashima; and (2) The mechanisms of Asari clam shellfisheries ground formation in Ise Bay, Central Japan.

“The objective of the first study is to verify the bottom-up effect of artificial reefs in relation to chemical factors such as nutrients, suspended



Outgoing Visiting Scientist Dr. Masashi Kodama receives his certificate of appreciation from Dr. Rolando Platon, culture systems specialist

solids, and organic matter,” Dr. Nambu presented.

Artificial reefs have an important role in increasing fish stock, improving the nursery grounds and enhancing production in an area. A study proved that artificial reef area has higher nutrients, thus, Dr. Nambu is expecting similar results for his study in Kashima Sea, East Japan.

“For the 2nd case study, the objective is to clarify the spatial-temporal distributions of the Manila clam and the surf clam in relation to the topographic features, sediment condition and wave motions on the flat.”

According to Dr. Nambu, both Manila clam and surf clam dominate tidal flats in Japan. While many previous studies focused on these two clams, ecological and spatial distribution aspects of their early life stage are not yet

known. Hence, he determined the spatial distribution of these benthos organisms.

Nambu’s technical experience include population ecology, biochemistry, fisheries engineering, and biomineralization, among others. He was awarded his Ph.D. degree on the year 2006 under the Department of Life Science, Faculty of Bioresources, Mie University.

Overview and history of IMTA study, from ancient to modern and the recent decade in SEAFDEC/AQD

According to Dr. Kodama, modern IMTA started in the 1970s. The practice used to be called polyculture, integrated, or ecologically-engineered aquaculture until the term Integrated Multi-Trophic Aquaculture (IMTA) was defined in 2004.

“One of the objectives of IMTA is to mitigate impact by diversifying nutrient flow, and at the same time, diversifying yield and increasing income by secondary species,” Dr. Kodama stated.

On his first year, Kodama explored possible site location to conduct the on-farm experiment and decided to utilize the facility in Igang, Guimaras. They put up their IMTA design in Barangay Pandaraonan, near Igang Marine Station in the year 2015.

The IMTA candidate species used are milkfish, sandfish, and seaweeds. Their IMTA design was also modified according to the challenges faced in the field.


“This on-farm demonstration experiment is a collaboration with the local fisherfolk in Brgy. Pandaraonan, Guimaras. It’s like a community-based activity with a research institution and the LGU. And it was quite interesting to work with those local fisherfolk, I was able to experience their culture. That was a really good experience for me,” Dr. Kodama recounted.

“Since this is a community-based activity, we also experienced, possibly, poaching. That’s also a part of socioeconomic data, for me, indicating that that thing can happen. Also what is interesting, it happens after we have a good harvest, so

they know that we have good milkfish in the pen, which means that our biological experiment is still successful. So that’s how I think what happened positively,” he added

The IMTA Project is a SEAFDEC/AQD – JIRCAS collaborative study that started in the year 2011. Phase 1 (2011- 2016) is titled ‘Development of Integrated Multi-Trophic Aquaculture Techniques for Livelihood Improvement,’ while Phase 2 (2016- 2012) is the ‘Demonstration and Verification of Sustainable and Efficient Aquaculture Techniques by Combination of Multiple Organisms.’

“I think we can divide this into three stages. First, there was Dr. Watanabe’s time, that was based on the laboratory, then we brought it out to the field, that’s phase two, that’s my time. We extract the actual problems, what are the possible practical solution in the field, and then summarize those problems and how to deal with it’

“After this, we will proceed to more extension [activities] and explore possible location for an additional case study or the possible adopter; maybe the same IMTA design [can be adopted] in a certain location to create a map near our pilot study. That’s phase three and that will be the task for my successor, Dr. Nambu,” Dr. Kodama explained. 

-DEVCOM

SEAFDEC/AQD's thrusts gear towards addressing urgent concerns of the aquaculture industry

SEAFDEC/AQD Chief Dan Baliao reported the Department's new thrusts towards addressing urgent concerns of the aquaculture industry during the Network of Aquaculture Centres in Asia-Pacific's (NACA) 30th Governing Council Meeting held in Guangzhou, China.

Baliao reported SEAFDEC/AQD's effort to revive black tiger shrimp (*Peneaus monodon*) farming industry through the banner program *Oplan Balik Sugpo*.

The program was launched in September 2017 in the wake of the devastating effect of the AHPND disease in Southeast Asia. Current evidence, including shrimp farming success in Thailand in spite of present conditions, points to the more resistant nature of *P. monodon* to the aforementioned disease.

"We have renovated and prepared our facilities for new bloodstock and spawners which undergone a stringent screening process and make them free from

pathogens," Baliao said during his presentation. As of the moment, the first batch of post-larvae produced has been stocked in collaborating farms.

Baliao also reported the collaborative project with the Bureau of Fisheries and Aquatic Resources (BFAR).

"We have also embarked on the second phase of the Joint Mission for Accelerated Nationwide Technology Transfer and Promotion Program (JMANTTP)," he added.

The first phase of JMANTTP has been widely successful and the second phase will cover the full operationalization and implementation of technology demonstration, and training and information dissemination on the various research done by the Department. With the success of the first phase, Baliao has every reason to believe that the ongoing phase will yield achievements for the industry.

The development of low-cost and quality diets for major species, which is initially for bloodstock, to support the BFAR's program on Bangus Fry Sufficiency now extends to grow-out. The construction of a BFAR Feed Mill to be hosted by SEAFDEC/AQD at Tigbauan Main Station is in the pipeline.

Biosecurity measures in the milkfish hatchery facilities are strictly implemented to ensure a safe fry production. To hasten the production process, additional milkfish broodstocks were also procured and kept at SEAFDEC/AQD's Integrated Fish Hatchery Complex. [a](#)

-MET ALDON / JM DE LA CRUZ



Procured milkfish broodstocks were transported from Guimaras to Tigbauan Main Station to hasten the production of fry as part of the BFAR's Bangus Fry Sufficiency Program



aqd matters

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