

WE GLADLY WELCOME YOU BACK. FishWorld museum, located at SEAFDECAQD Tigbauan Main Station in Iloilo, is once again accepting guests. Book your appointments now. More information on Page 8. *Photo from SEAFDEC/AQD Archive*



aqd matters

November-December 2021

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

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SEAFDEC/AQD inaugurates new aquaculture facilities

NEWLY-ESTABLISHED aquaculture facilities at SEAFDEC/AQD were officially inaugurated in a ceremony held last 9 Dec. 2021 at its Tigbauan Main Station in Iloilo.

Top executives of the Philippine government,

headed by Department of Agriculture (DA) Secretary Dr. William Dar, toured the facilities with Chief Dan Baliao and the members of the SEAFDEC/AQD Executive Committee. Multi-species hatcheries and broodstock tanks were established to

intensify the research center's demonstration and techno-transfer program as well as help address the shortage of aquaculture seeds in the Philippines.

"Science and technology is the engine of growth for aquaculture and fisheries,"



Chief Dan Baliao (middle) shows DA Secretary William Dar, Undersecretary Cheryl Marie Natividad-Caballero, and guests around the newly-established multi-species hatchery last 9 Dec. 2021. *Photo by JM dela Cruz*



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Officers of SEAFDEC/AQD, DA, and Tigbauan LGU cut the ribbon for the official inauguration of the new aquaculture facilities last 9 Dec. 2021 at Tigbauan, Iloilo. Photo by JF Aldon

said Sec. Dar in his speech. He expressed his gratitude to SEAFDEC/AQD for its work, particularly for the ready-for-adoption technologies it developed for economically important aquaculture species. The Secretary then challenged the research center to scale up the verification and demonstration of the technologies in partnership with Philippine government agencies including DA's Bureau of Fisheries and Aquatic Resources (DA-BFAR), National Fisheries Research and Development Institute (DA-NFRDI), and local government units.

"The government is rooting for SEAFDEC/AQD and its efforts towards sustainable aquaculture," he added. **a**

-JM DELA CRUZ



Chief Baliao gives Secretary Dar a walkthrough tour of an exhibit that features the aquaculture technologies that are currently being developed at SEAFDEC/AQD. Photo by JM dela Cruz



Chief Baliao gives a message expressing his appreciation to the Department of Agriculture led by Secretary Dar for its continued support of SEAFDEC/AQD's programs and projects. Photo by JM dela Cruz



Department of Agriculture Sec. Dar challenges SEAFDEC/AQD scientists, researchers, and staff to develop technologies that gear towards the modernization of the aquaculture industry. Photo by JM dela Cruz

Oplan Balik Sugpo progress reported to PH shrimp industry



A panel of aquaculture experts and industry players discuss the progress of Oplan Balik Sugpo during the 13th Philippine Shrimp Congress held from 9 to 11 Nov. 2021.

OPLAN Balik Sugpo is a program launched by SEAFDEC/AQD during the 11th Philippine Shrimp Congress in 2017 to revive the black tiger shrimp industry, which used to be one of the country's biggest aquaculture export. After four years, SEAFDEC/AQD experts presented the program's progress during the 13th Philippine Shrimp Congress held from 9 to 11 Nov. 2021.

Dr. Leobert de la Peña reported that disease prevention schemes have been verified and established for responsible management of wild-caught shrimp spawners by following stringent quarantine protocols in the hatchery phase.

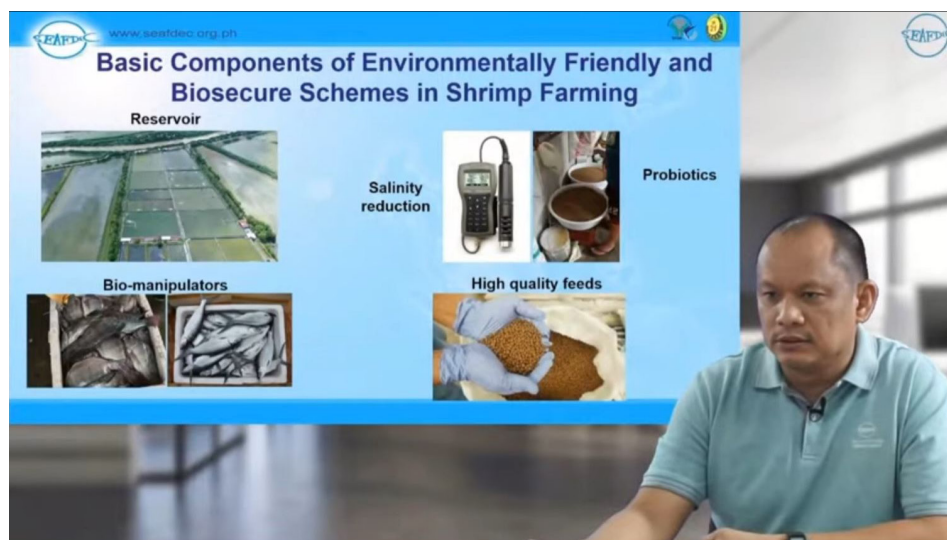
Dr. Roger Edward Mamauag reported that the production of tiger shrimp at the Dumangas Brackishwater Station of SEAFDEC/AQD satisfactorily verified technologies based on the consistently high survival and harvest from 2019 to 2021. Before being promoted for commercial adoption by shrimp farmers, the technologies will be field-tested in various DA-BFAR locations and private farms.

The open forum discussed the significance of producing clean, healthy, and robust postlarvae to meet the rising demand from shrimp growers. It was said that DA-BFAR's breeding program for *Penaeus monodon* is essential to meet this demand, whereas the acquisition of specific-pathogen-free (SPF) *P. monodon* broodstock is part of SEAFDEC/AQD's plans in line with the National Shrimp Roadmap. **a**

-JM DELA CRUZ



Dr. Leobert de la Peña, scientist and Research Division head, presents the updates on SEAFDEC/AQD's *Oplan Balik Sugpo* and other priority projects on crustaceans.



Dr. Roger Edward Mamauag, scientist and Technology Verification and Extension Head, presents the details of environment-friendly and biosecure schemes in shrimp farming practiced at SEAFDEC/AQD.

Pompano harvested fresh from Dumangas ponds

KNOWN for its tasty meat, pompano is slowly becoming one of the favorite high-value marine fishes in the Philippines and other parts of the world. This demand pushed SEAFDEC/AQD to improve and refine its existing pompano culture technique by incorporating greenwater technology. Pompano juveniles

were stocked in brackishwater ponds and were reared using phytoplankton-rich water to improve the quality of production.

This resulted in the bountiful harvest of pompano last 5 Nov. 2021 at SEAFDEC/AQD Dumangas Brackishwater Station in Iloilo, Philippines. [a](#)

-JM DELA CRUZ



More sabalo for more milkfish fry

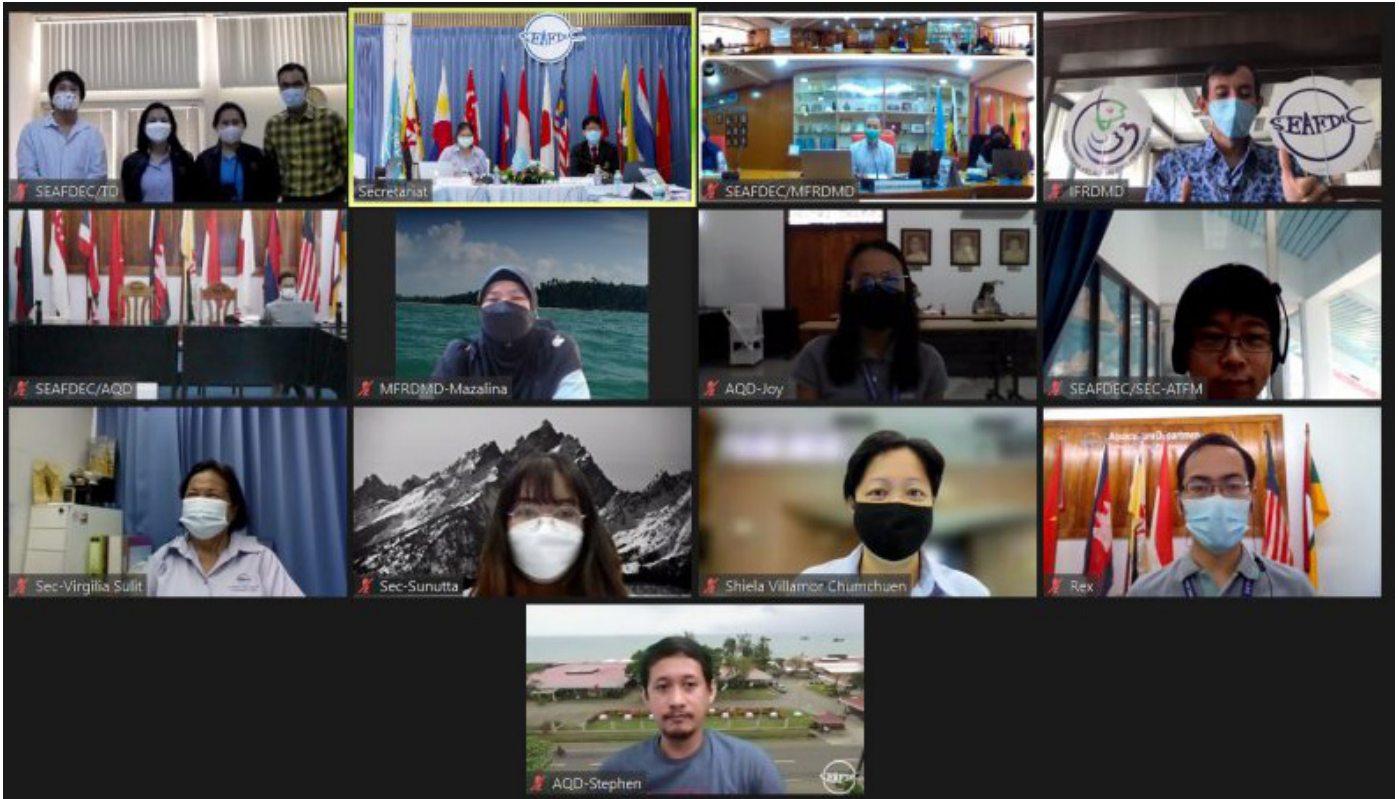
FIFTY *sabalo* or milkfish broodstock, acquired from Lawi, Guimaras, found home at SEAFDEC/AQD's new milkfish broodstock tanks in Tigbauan, Iloilo last 29 Nov. 2021.

SEAFDEC/AQD has been building its reserve of milkfish breeders to help reduce the Philippines' reliance on imported fry. The initiative is in support of the Bangus Fry Sufficiency Program of the Bureau of Fisheries and Aquatic Resources. [a](#)

-JM DELA CRUZ



SEAFDEC/AQD attends online meeting for information staff




A screenshot of 22 ISP Meeting representatives including the SEAFDEC Deputy Secretary-General, senior officials, and information-related officers from the SEAFDEC Secretariat, TD, AQD, MFRDMD, and IFRDMD as they gather to discuss the information efforts in 2021 and plans for 2022.

TWELVE SEAFDEC/AQD information staff from the Training and Information Division and the Management Information Systems Office participated in the Twenty-second Meeting of the SEAFDEC Information Staff Program (22 ISP Meeting) held on 29 Nov. and 1 Dec. 2021 through an online platform.

The ISP meeting is an annual event organized by the SEAFDEC Secretariat to monitor the progress of the implementation of information strategies to enhance the visibility of SEAFDEC especially in Southeast Asia.

For this year, in addition to reporting about the progress of the information strategies, other initiatives like the hosting of SEAFDEC/AQD

of the repositories (digital repositories of scholarly and research information that can be accessed online) of the other SEAFDEC departments was also discussed. The migration of the SEAFDEC repositories to the AQD server is intended to improve their performance and reduce maintenance expenses due to the consolidation of hardware and management costs.

Aside from the AQD information staff, the SEAFDEC Deputy Secretary-General, Senior Officials of the SEAFDEC Secretariat, and information-related officers from the SEAFDEC Secretariat and other departments were also present during the meeting. 

-RH LEDESMA



aqd matters

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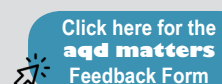
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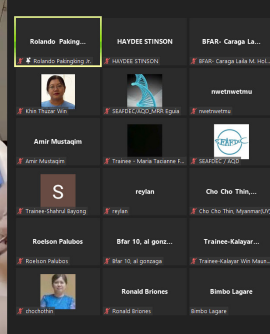
'Adoptable and sound' community-based freshwater aquaculture course

TWELVE international participants from Brunei Darussalam, Malaysia, Myanmar, and the Philippines completed the Online Training Course on Community-Based Freshwater Aquaculture for Remote Rural Areas of Southeast Asia conducted last 16 to 25 Nov. 2021 via an interactive learning platform hosted by SEAFDEC/AQD.

"What I learned from this training course are adoptable and sound aquaculture practices from start to finish, including pre-production, production, marketing, disease surveillance, detection, and treatment, fish handling, and processing," said Ms. Laila Holoyohoy, an aquaculturist from the Philippines' Bureau of Fisheries and Aquatic Resources in Caraga.

This AQD online training course was supported by the Government of Japan-Trust Fund. [a](#)

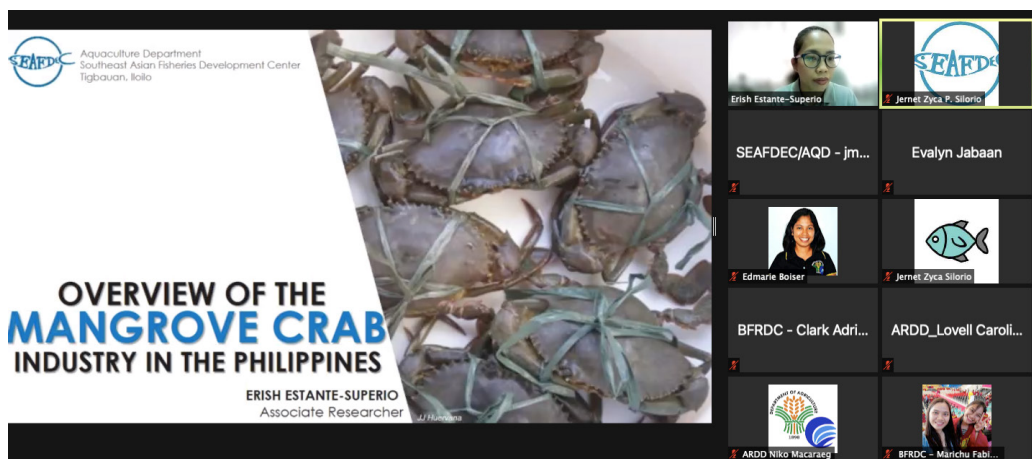
-JM DELA CRUZ



▲ Twelve international participants gather virtually to gain technical knowledge and skills on producing freshwater aquaculture commodities from SEAFDEC/AQD last 16 to 25 Nov. 2021.

▲ A screenshot of a demonstration video shown during a lecture on the hatchery and nursery of giant freshwater prawn.

SEAFDEC/AQD conducts online course on crab culture for PH research institute



A screenshot of the live lecture on the overview of the mangrove crab industry in the Philippines.

UPON THE request of the Philippines' National Fisheries Research and Development Institute (NFRDI), SEAFDEC/AQD

organized a specialized online training course on mangrove crab hatchery for their staff.

Eight NFRDI staff attended the training course held via an online platform from 13 to 17 Dec. 2021. Through

this course, the NFRDI staff gained technical knowledge in hatchery of mangrove crab with emphasis on *Scylla serrata* for sustainable livelihood and employment generation.

The online course was a mix of lecture and demonstration videos on biology and identification crab species, hatchery operations, feed preparation, natural food production, disease and health management, and harvest and packing of crab for transport among others. Some lectures were also conducted live via Zoom wherein AQD mangrove crab experts entertained questions and clarifications from the participants. [a](#)

-RH LEDESMA

Maguindanao fishers learn crab culture

MANGROVE crab production techniques developed by SEAFDEC/AQD were highlighted in a two-day online training course conducted last 4 to 5 Nov. 2021 for fisherfolk beneficiaries from Maguindanao, Philippines.

The biology of mangrove crabs, biological considerations in establishing a crab hatchery, broodstock management and larval rearing, and nursery and grow-out management were discussed. SEAFDEC/AQD experts delivered lectures via Zoom to attendees assembled at Cotabato City.

The activity was conducted under SEAFDEC/AQD's Joint Mission for Accelerated Nationwide Technology Transfer Program (JMANTTP II) and in collaboration with



Chief Dan Baliao, JMANTTP project leader, joins the two-day Online Training Course on Mangrove Crab Production and Management last 4 to 5 Nov. 2021.

the Ministry of Agriculture, Fisheries, and Agrarian Reform (MAFAR) of the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), and the Fisheries, Coastal

Resources and Livelihood Project (FishCORAL). It was funded by the International Fund for Agricultural Development (IFAD). [a](#)

-JM DELA CRUZ

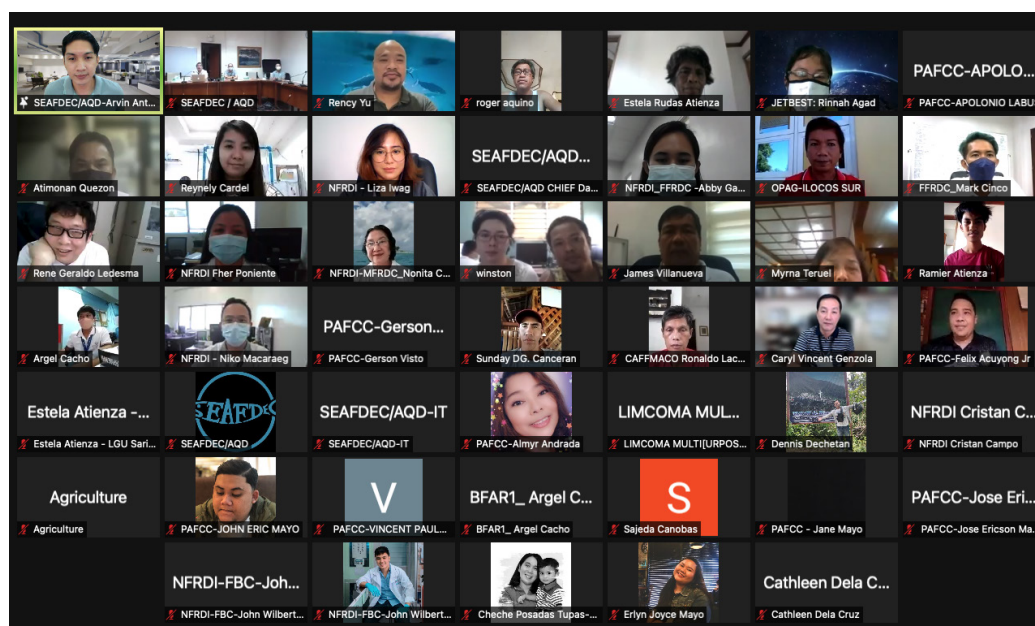
Fish feed and nutrition training course, a hit among feed millers

SIXTY-THREE feed millers, fish farmers, and government technical staff attended the Online Training Course on Fish Nutrition and Feed Development conducted by SEAFDEC/AQD last 23 to 26 Nov. 2021 through an interactive learning platform.

Fish nutrition plays a crucial role in making aquaculture ventures profitable as feeds account for over 50 percent of the production cost. Through this course, AQD experts shared the basic principles of fish nutrition and the techniques for formulating, preparing, and evaluating cost-efficient fish diets through a series of lectures and video demonstrations.

This course was conducted in collaboration with the Philippines' National Fisheries Research and Development Institute. [a](#)

-JM DELA CRUZ




ONLINE LEARNING. SEAFDEC/AQD's Training Section gathers 63 participants to learn about fish feed and nutrition through an online platform last 23 to 26 Nov. 2021.

FishWorld reopens after two years

AFTER TWO years of closing its doors since the beginning of the pandemic, SEAFDEC/AQD's FishWorld finally reopens to accommodate visitors starting today.

Guests can safely visit and see their favorite aquarium animals, museum collections, and exhibits by following the minimum health protocols such as wearing masks, observance of proper hand hygiene, and physical distancing.

The aquarium museum and visitor center will only accept guests with confirmed appointments. Kindly request your appointments through this Facebook page (link below) or call (033) 3307032 or +639778400137 and look for Ms. Hananiah Sollesta-Pitogo. 

-JM DELA CRUZ

 **Book here!**



Tilapia culture technology shared with stakeholders


AS TILAPIA continues to be one of the most cultured freshwater species in the world, information on how to sustainably farm the species remains in demand.

Eighty participants from the academe, local government units, and private sectors gathered as Dr. Maria Rowena Eguia, a scientist from SEAFDEC/AQD, shared her knowledge about tilapia hatchery and breeding management in a webinar conducted last 10 Dec. 2021.

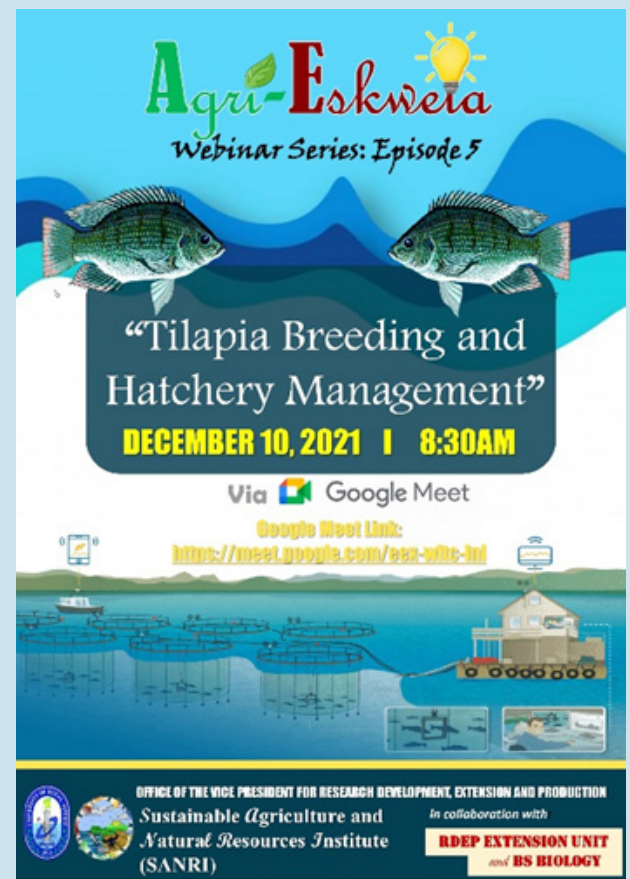
Dr. Eguia discussed the biology and environmental requirements of farming tilapia, efficient and sustainable hatchery systems, and proper

breeding management. She also answered how-to questions about farming the fish in a forum.

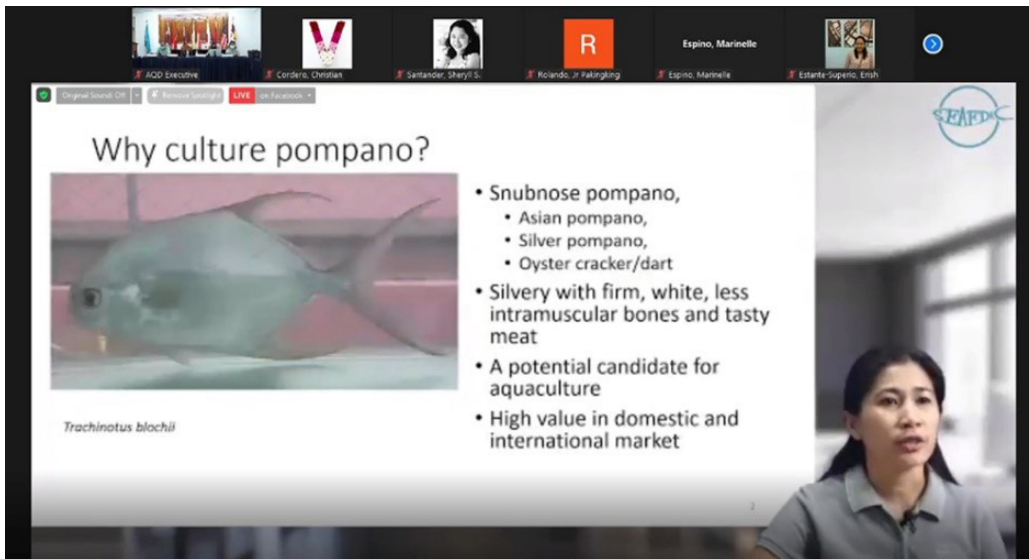
This webinar series aimed to discuss the latest trends and status of aquaculture technologies and other efforts in addressing food security in the country. This perfectly aligns with AQD's mandate of disseminating useful aquaculture information directly to target stakeholders.

The event was organized by the Sustainable Agriculture and Natural Resources Institute (SANRI) in collaboration with the University of Rizal System (URS) Cardona Campus in the Philippines. 

-JM DELA CRUZ



SEAFDEC/AQD holds virtual Farmers' Forum



A screenshot of the lecture on pompano culture during the Farmers' Forum held via Zoom on 16 Dec. 2021 by SEAFDEC/AQD researcher Ms. Ma. Irene Legaspi.

TO DISSEMINATE the science-based aquaculture technologies it developed to a wider audience, SEAFDEC/AQD organized a virtual Farmers' Forum on 16 Dec. 2021 via Zoom, which was also livestreamed through the institution's Facebook page.

During the event, AQD experts talked about the advances in aquaculture technologies for black tiger shrimp, mangrove crab, and pompano. After the lectures, an aquaculture clinic was also held where fish farmers and other aquaculture stakeholders get to consult AQD scientists and researchers on the problems that they encounter in their farms for free.

The Forum had 480 attendees via Zoom. The forum and the aquaculture clinic also gained 18,000 and 766 views, respectively, on the day of the event. [a](#)

-RH LEDESMA

Two new publications launched, can be downloaded for free

Mga Teknolohiya sa Pagpapanaak ng mga Isdang Tabang
Tilapia, Karpa, Hito, at Ayungin

Maria Rowena R. Romana-Eguia
Frolan A. Aya
Ruel V. Eguia

SEAFDEC
Southeast Asian Fisheries Development Center
AQUACULTURE DEPARTMENT
Tigbauan, Iloilo, Philippines

Proceedings of the International Workshop on the Promotion of Sustainable Aquaculture, Aquatic Animal Health, and Resource Enhancement in Southeast Asia
25-27 June 2019, Iloilo City, Philippines

Promotion of Sustainable Aquaculture, Aquatic Animal Health, and Resource Enhancement in Southeast Asia

Frolan A. Aya
Leobert D. de la Peña
Nerissa D. Saliyo
Eleonor A. Tendencia
Editors

Government of Japan-Trust Fund

SEAFDEC
Southeast Asian Fisheries Development Center
Aquaculture Department

Scan here to download the publications

A MANUAL on hatchery techniques for freshwater species, and a collection of scientific articles on sustainable aquaculture, resource enhancement,

and aquatic animal health was published and made available for free download by SEAFDEC/AQD during its Book Launching event last 16 Dec. 2021.

The latest addition to AQD's Aquaculture Extension Manual (AEM) Series is *Mga Teknolohiya sa Pagpapanaak ng mga Isdang Tabang*, a four-in-one manual on the

hatchery of tilapia, carp, catfish, and silver therapon written in Filipino language.

"*Hango sa impormasyon mula sa SEAFDEC/AQD Institutional Repository, napapansin namin na maraming kumukuha ng libreng kopya ng mga manual tungol sa isdang tabang na nakasulat sa salitang Filipino* (Based on the information from the SEAFDEC/AQD Institutional Repository, we noticed an increasing number of people accessing manuals on freshwater aquaculture that are written in Filipino)," said Dr. Ma. Rowena Eguia, the main author of the extension manual, during launching of the publication.

As demands increase for freshwater aquaculture products, the clamor for accessible information on farming also ascended. Dr.

Continue to next page...



Dr. Frolan Aya, Dr. Leobert de la Peña, Dr. Nerissa Salayo, and Dr. Eleonor Tendencia, editors of Proceedings on Sustainable Aquaculture, Aquatic Animal Health, and Resource Enhancement in Southeast Asia.

Eguia also mentioned that producing publications in the local language is a way of prioritizing the small-scale, Filipino fish farmers.

The second publication is the proceedings Promotion of Sustainable Aquaculture, Aquatic Animal Health, and Resource Enhancement in Southeast Asia, a collection of 30 articles comprised of country reports and recommendations addressing important aquaculture issues in the region. This is a product of a workshop with



Dr. Ma. Rowena Eguia, Dr. Frolan Aya, and Engr. Ruel Eguia, authors of a new manual on hatchery technologies for freshwater species.

the same title conducted last 25 to 27 June 2019 in Iloilo City, Philippines organized by AQD and funded by the Government of Japan-Trust Fund.

“This publication should be a valuable reference to find solutions to the challenges we and our stakeholders face,” said Dr. Frolan Aya, an AQD scientist and one of the four

editors of the proceedings, in his message during the event. The publications are now available for open access here, <https://repository.seafdec.org.ph/>.

-JM DELA CRUZ

Farmers must understand the costs of tech-driven aquaculture

AUTOMATED fish farming run by sensors, artificial intelligence, and powered by the internet and big data is seen to be the next frontier in sustainable production to meet the future demand for seafood.

Modern urban fish farms take on a much smaller footprint but can achieve 58 times the production of traditional farms. Traditional farms may produce 34 metric tons of fish per hectare a year, but with the right technology, next-generation farms can harvest as much as 2,000 tons per hectare annually in an indoor, climate-proof, bio-secure, and zero antibiotic environment.

Smart farms are also more energy efficient. A kilogram of fish may take only 1.5

kilowatts of electricity to produce while conventional systems may use 25 to 30 kilowatts. Recent advances in genetics, nutrition, and other techniques further the capacity of farms to produce more with less inputs.

However, the use of modern equipment and the most recent technologies might not be for everyone. An aquaculture expert cautioned that to succeed, fish farmers must first understand the cost of technology implementation.

Aquaculture “is a very bottom-line-driven industry,” said Matthew Tan, associate professor in aquaculture at James Cook University and Singapore’s private sector representative to the APEC Policy Partnership on Food Security.



DKV Memorial Lecture resource persons, Prof. Matthew Tan and Ar. Francis Neil Quijano, virtually present their respective life’s work last 16 Dec. 2021.

In a lecture, Professor Tan said fish farmers should understand financial modelling before moving up to Aquaculture 4.0, fish farming’s adaptation of the fourth industrial revolution (Industry 4.0) defined by the current trend of smart automation, interconnectivity, and other disruptive technologies.

Professor Tan spoke during the 28th Dean

Domiciano K. Villaluz Memorial Lecture of SEAFDEC/AQD which was held via Zoom and broadcast on Facebook last 16 Dec. 2021.

“First look at the market, who is buying? What is the price of the fish? what is the cost of technology implementation?” he advised.

Continue to next page...

Counting the costs

Professor Tan added that for every additional upgrade in equipment or technology, the additional cost must be considered to determine whether it is worth pursuing or not. “It must make financial sense in order to implement it,” he said.

As an example, he cites his experience operating an abalone hatchery in China where his cost of production for one “baby abalone” was three to four cents. “If my cost of implementation of a technology... cost me another four cents, that means it cost me eight cents to produce one baby abalone. I won't use it because my selling price is only six to seven cents.”

“The cost of production must get lower, while you maintain your offtake price or selling price, then the technology will work for you in the space you are operating in,” Professor Tan adds.

On the other hand, he says high initial investments in modern aquaculture “can make more financial sense.” Professor Tan is currently working on super-intensive indoor shrimp farms that he acknowledges are more expensive to set-up than



A screenshot of Professor Matthew Tan's video presentation showing an indoor super-intensive aquaculture system in Denmark.

open ponds. But considering the risk of shrimp disease outbreaks, the highly-biosecure enclosed systems can be a better option.

To compete with shrimp produced in the open pond system, Professor Tan's team computed that they need to produce at least 15 kilograms of *vannamei* shrimp per cubic meter, which then becomes their target. Meanwhile, open pond farmers can produce three to five kilograms per cubic meter, assuming no diseases affect the stocks.

“The open pond farmers always think that they are much cheaper, but if they take into account all the losses when the disease strikes them, they find that they're actually

losing a lot more,” Professor Tan said.

New technology and collaboration

Another speaker during the lecture also explained how new technology and equipment can reduce the costs of electricity, particularly in the Philippines where power-intensive recirculating aquaculture systems (RAS) are struggling to take off.

“In the Philippines, we've been using the old technology, for example we're using roots blower, minimum of one horsepower which is what, 745 watts,” said Francis Neil Quijano, an architect who is behind Agritektura, a

multi-disciplinary movement aiming to transform communities.

He said he is now using a better energy-efficient aquapump that consumes only around 165 watts and that could make recirculating aquaculture systems more viable. Quijano says that while fish farmers are still using 1990s technologies, he encountered more up-to-date technologies, introduced as late as 2020, by working with other professionals including those from outside the Philippines.

“Let's start with working with people, working with different professionals... it's not just modern aquaculturists, but architects, engineers, researchers,” he added.

Quijano spoke in the lecture about how, in response to the COVID-19 pandemic, Agritektura developed modular aquaculture systems using RAS with automated aeration, filtration, and nutrition systems, to boost aquaculture in Philippine communities.

“Let's be open to technology and I know it will work in the Philippines,” he said, particularly referring to equipment and infrastructure. “Perhaps we can explore more, study, and just be open. Old systems will not work.” [a](#)

-RD DIANALA



A screenshot of Mr. Francis Neil Quijano's presentation with photo showing a modular aquaculture set-up with automated aeration, filtration, and nutrient system.



CHRISTMAS @ SEAFDEC/AQD

SEAFDEC/AQD conducted a series of events in December to celebrate the Christmas Season including the ceremonial lighting of the giant Christmas tree, gift-giving activity, and Christmas program.

Chief Dan Baliao took the opportunity to assure stakeholders that the Department will continue working on its mandates.

“The past 48 years witnessed how SEAFDEC/AQD labored with pride in addressing food security, livelihood creation, and environmental concerns, among others through aquaculture research and development. As the future unfolds, we should remain steadfast in fulfilling our objectives even more,” he said during the Christmas Program last 20 Dec. 2021 at SEAFDEC/AQD’s Tigbauan Main Station in Iloilo.

Chief Baliao shared that SEAFDEC/AQD will continue to work on problem areas identified through discussions with stakeholders.

“Our accomplishments in 2021 will provide the groundwork for our plans for 2022, particularly the continuous refinement, improvement, and modernization of sustainable aquaculture technologies,” he added. 📷

-JM DELA CRUZ

IN THE SPIRIT OF CHRISTMAS. SEAFDEC/AQD employees enjoy the view of the giant Christmas tree and the firework display during the Ceremonial Lighting event last 13 Dec. 2021 at the grounds of SEAFDEC/AQD Tigbauan Main Station. **Photo by RD DIANALA**

Gift-giving

SHARING THE LOVE. SEAFDEC/AQD shared the Christmas spirit with its neighboring barangays, Nanga and Buyuan, during a gift-giving activity last 14 Dec. 2021 at the Multipurpose Hall. **Photos by JF Aldon**



CELEBRATING TWO SUCCESSFUL YEARS. Despite the pandemic, 2020 and 2021 have been rewarding for the Department with successful research endeavors, newly-built facilities, and countless recognitions. The Christmas Program conducted last 20 Dec. 2021 became a venue to celebrate and award the employees who made strides during the past two years. **Photos by JM dela Cruz**

CHRISTMAS PROGRAM