

Student trainees take part in the annual sampling of milkfish broodstock on 18 January 2019. The annual sampling on milkfish broodstock is done to monitor the maturity of the fish before the start of the spawning period (February-November). [PHOTO BY JF ALDON]



# aqd matters

January-February 2019

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

## Matters inside

Sec. Manny Piñol bares plans on fisheries; to set meeting between SEAFDEC and BFAR 2

BFAR, SEAFDEC, UP to address galunggong decline 3

Alternative feed ingredients to reduce aquaculture's dependence on wild fish 4

Chinese Consul General keen to collaborate on fisheries research 6

Kalibo crab farmers find solutions to nursery woes 7

SEAFDEC/AQD expert helps identify local food fish 10

## SEAFDEC and BFAR begin on-site training in Cotabato

**KABACAN, Cotabato** - SEAFDEC Aquaculture Department (AQD) along with the Bureau of Fisheries and Aquatic Resources (BFAR) conducted an on-site training on freshwater aquaculture in Kabacan, Cotabato last 25-28 February 2019.

During the Opening Ceremony, Mr. Usop Pentaliday, OIC Director of BFAR-12, welcomed SEAFDEC/AQD researchers, BFAR fisheries coordinators and participants to the training. He lauded the efforts of SEAFDEC/AQD headed by Chief Dan Baliao for coming to far-flung Kabacan, Cotabato just to teach BFAR stakeholders and clients practical aquaculture technologies suitable in land-locked areas like Cotabato.



SEAFDEC/AQD scientist Dr. Frolan Aya demonstrates how to induce spawning of catfish by injecting hormone. PHOTO BY R SERVANO

Chief Baliao explained that the activity is within the auspices of the Joint Mission for Accelerated Technology Transfer Program (JMANTTP) which he is reviving. The Program was implemented in 1996 but was suspended due to lack of funds. "I am reviving this

Program because this will not only augment fish production but also provide the people livelihood," he said. He also added that there will be more of this kind in other parts of the country.

Mr. Ferdinand Piñol, Executive Assistant at the Department of Agriculture,

*Continued on next page...*



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challenged the participants in his keynote speech to translate the knowledge they learned from the training into something tangible that would help the country augment the declining fish production. "Take advantage of this activity that you are availing now. This is a rare privilege of having SEAFDEC coming out from their comfort zone at SEAFDEC to teach you the right and sustainable aquaculture technology".

The on-site training had 68 participants from all 17 municipalities of Cotabato. The highlight of the activity was demonstration of techniques on harvest of fry, packing, acclimation,



SEAFDEC Chief Dan Baliao delivering his message at the Opening Ceremony during the On-site Training on Freshwater Aquaculture conducted at the University of Southern Mindanao, Kabacan, Cotabato. Guests include (L-R): DA Head Executive Assistant, Ferdinand Piñol, BFAR-12 Regional Director Usop Pandaliday and BFAR Consultant Constantino Diazon. PHOTO BY R SERVANO

transport and stocking in ponds. Dr. Rolando Platon demonstrated the preparation of feed for sex reversal of tilapia. Dr. Frolan Aya

showed to the participants the techniques in induced spawning of catfish and stripping of eggs after maturation in 8-12 hours.

The participants thanked SEAFDEC and BFAR for giving them the chance to know the correct techniques to increase their production. **a**

- MET ALDON

## Sec. Manny Piñol bares plans on fisheries; to set meeting between SEAFDEC and BFAR

**KIDAPAWAN, Cotabato** - Department of Agriculture Secretary Emmanuel "Manny" Piñol bared plans on capture fisheries and aquaculture during the visit of SEAFDEC/AQD staff in his farm in Paco, Kidapawan, Cotabato last 24 February 2019.

"There is a need to synchronize direction for [capture] fisheries and aquaculture. We need to address alarming decline of capture fisheries in a sustainable manner," he said.

Sec. Piñol explained that while increasing fish production can be done to ensure fish on the table for every household, the need to restrict harmful means and ways should be enforced for sustainability. "I may enjoy fish today but I also need to ensure that there will be fish tomorrow because I want my *apo* [grandchild] to enjoy eating fish in the future," he stressed.

Other plans of Sec. Piñol is to set direction for capture fisheries and aquaculture,



Department of Agriculture Sec. Emmanuel "Manny" Piñol (2nd from left) with SEAFDEC/AQD consultants Ms. Eva Aldon (leftmost) and Dr. Rolando Platon (3rd from left) and SEAFDEC/AQD staff

hence, a meeting between SEAFDEC/AQD and the Bureau of Fisheries and Aquatic Resources (BFAR) will be set soon. Among the topics for discussion is the review of the 1998 Fisheries Code which he thinks needs to be revised. "It's high time to review it," he said. "That is why I have called on scientists from the University of the Philippines-Marine Science Institute to establish scientific data that would improve

variables that will be used as bases that limit commercial fishing within 15 km from the shore."

Sec. Piñol also emphasized the need to strengthen the relationship between SEAFDEC/AQD and BFAR to intensify the transfer of aquaculture technologies to fishers that will fill the gap voided by weather-dependent capture fishery. "As I see now, it seems it is world apart between these two

because BFAR does not seem to know that you have all these technologies developed already. BFAR should transfer these aquaculture technologies that will cascade down to fishers," he said.

In place now is the start of establishing 300 fish cages in every region which will ensure that people will have fish on their table. **a**

- MET ALDON

# 'Retired but not tired'



Dr. Maria Lourdes Aralar with husband Engr. Emiliano Aralar

After almost 33 years in service at SEAFDEC/AQD, scientist Dr. Maria Lourdes Aralar is still on the go with many things lined up for her even after she retired last 14 February 2019.

Dr. Aralar continues to be busy taking part in meetings and summits. She also continues to serve as SEAFDEC/AQD resource person for giant freshwater prawn training courses and as a reviewer/evaluator for research proposals at some government institutions.

Dr. Aralar is also busy doing eel project-related activities under the Japan-ASEAN Integration Fund (JAIF). She is currently helping organize the international eel workshop slated in April and finalizing an eel manual.

Prior to her retirement, Dr. Aralar served as Program Leader of the Maintaining Environmental Integrity Through Responsible Aquaculture and Station Head of the Binangonan Freshwater Station (BFS).

"BFS owes a lot from Doc Malou for years that she has ably steered the station, to where it is now in spite the odds," shared fellow scientist Dr. Maria Rowena Eguia.

From her base at BFS, Dr. Aralar churned out over 30 publications in different peer reviewed national and international journals, mostly on lake ecology and biodiversity. She also contributed to the development of giant freshwater prawn farming for which she has authored two manuals. When asked about her advice to young researchers at SEAFDEC/AQD, Dr. Aralar said that they should be open to new ideas and explore different directions early on in their career. "It is through this that you will truly find your passion so your science will not be just a job but something to find pleasure in," she said.

She also advised that it is also important for young researchers to be able to express themselves well and share their ideas since science is meaningless if not communicated properly to the right audience, not only in scientific publications but in general, everyday situations.

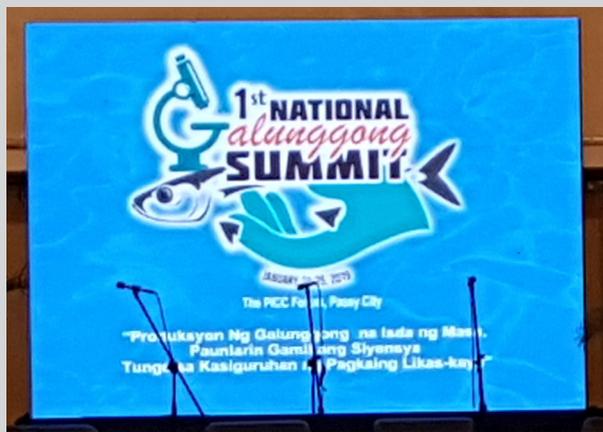
Having worked at SEAFDEC/AQD for more than three decades, Dr. Aralar is extremely grateful for her years at the institution for the personal and professional opportunities it has offered her. "My professional growth was due mainly to the nurturing environment SEAFDEC/AQD provided," she said.

She hopes that SEAFDEC/AQD will continue to grow as a well-respected and recognized institution, foremost in its field. "Future-proofing is one term I learned from my son and I think the people at SEAFDEC/AQD should think about how to go about this to keep the institution relevant in the years to come," advised Dr. Aralar.

Dr. Aralar said that she is still keeping her options open for her eventual retirement plans. "I was advised by my daughter to take it easy for at least six months before I decide what to do and I think that is sound advice," said Dr. Aralar. In the meantime, she looks forward to spending time with her grandson. **a**

- RH LEDESMA/RD DIANALA

## BFAR, SEAFDEC, UP to address decline of galunggong



PASAY CITY - The first national *galunggong* (roundscad) summit held on 24-25 January 2019 brought together researchers from different organizations to address decline of *galunggong* population. The Bureau of Fisheries and Aquatic Resources (BFAR), the Southeast Asian Fisheries Development Center/Aquaculture Department (SEAFDEC/AQD), the University of the Philippines (UP), and the National Fisheries Research and Development Institute (NFRDI), and other non-government organizations (NGOs) discussed the state of *galunggong* fisheries, identified issues and threats, promoted science-based management, and harmonized strategies to address fish sufficiency.

Department of Agriculture Secretary Emmanuel "Manny" Piñol delivered the Opening Remarks during the Summit while Congressman Luis Ferrer as chairperson of the House Committee on Aquaculture and Fisheries Resources delivered the closing remarks.

During the workshop, SEAFDEC/AQD, along with researchers from BFAR, UP, NFRDI, and other NGOs, was tasked to conduct science and action research to come up with a science-based fisheries management and strategies towards fish sufficiency.

With *galunggong* issue now taking center stage, SEAFDEC/AQD Chief Dan Baliao is calling again on aquaculturists to intensify culture production of bangus and tilapia. "I am pretty sure if culture production of these two species will be intensified, they can command a much lower price than *galunggong*," he said. **a**

- MET ALDON

# Alternative feed ingredients to reduce aquaculture's dependence on wild fish

A paradox in seafood production highlights the need for alternatives to fish-based ingredients in aquaculture feed. Aquaculture has generally been seen to provide for the fish that overharvested oceans could no longer provide. However, the dramatic growth of the industry has been achieved at the expense of millions of tons of fish caught from the oceans. Small marine fish and bycatch are important sources of fish meal and fish oil which are primary sources of protein and fatty acids for aquaculture feed.

While the sources of fish meal and fish oil are usually not for human consumption, the ecological impact of an ever-increasing demand to supply the growing aquaculture industry calls for a shift away from the unsustainable practice. To provide for the protein and oils in aquaculture feed, alternatives sources have been sought to replace fish meal and fish oil, whether partially or totally.

The need for alternative feed ingredients is underlined by the rising cost of fish meal and fish oil. Already, feeds can account for over 50% of the production cost in fish farms. While plant-based protein sources such as soybean meal and wheat gluten have provided lower-cost alternatives, volatile prices have incentivized the continuing search for still more alternative feed ingredients. Southeast Asia is rich in the diversity and quantity of resources that could hold potential to substitute for fish meal and fish oil. Locally-available

ingredients further provide the added benefits of cost savings and reduced imports.

Advances in feed development have identified several alternative sources of protein. Terrestrial plant-based sources, while the most abundant substitute for fishmeal, unfortunately tend to have a highly variable nutrient profile, lacking or low in essential amino acids, contain anti-nutritional factors, and may not be available in commercial quantities. Because of these, their ability to substitute fishmeal is limited. However, advances in feed processing technologies leave much potential to improve their nutrient profile and the removal of anti-nutritional factors. Also, the nutrient profiles of formulations using plant protein sources is improved when combined with good animal protein sources.

Terrestrial animal sources comprise another group of alternative feed ingredients. Meat meal, poultry meal, bone meal, feather meal and blood meal offer good protein content and better palatability among farmed fish. Seafood by-products from processing plants include shrimp heads and shells. These have high protein content but are prone to spoilage.

Meanwhile, there are also non-conventional sources of protein such as snails, worms, frogs and maggots. Very promising sources are single-cell microorganisms such as yeast and algae which could further provide probiotic effects and enhance the nutritional value of fish meat.



Formulated feeds at AQD with alternative ingredients. PHOTO BY IT TENDENCIA

## R&D on alternative feed ingredients at AQD

SEAFDEC/AQD has been doing extensive research and development on nutritional requirements, alternative feed ingredients and their digestibility, and developed suitable feed formulations for a wide range of aquaculture species at various growth stages.

In recent years, AQD has been testing agro-industrial wastes and byproducts (mango peel silage, soybean curd residues, citrus by-products) for suitability as protein source for tilapia breeders and fingerlings. Protein-enhanced copra meal was also analyzed and tested as protein source for grouper (*Epinephelus coioides*). For the abalone (*Haliotis asinina*) breeder diet, the algae thraustochytrid was tested for means to enhance its lipid content. A hydrolysate of milkfish by-products, with its rich protein content, was also evaluated as a potential feed ingredient for pompano (*Trachinotus blochii*) and tilapia diets.

Promising results were obtained from distillers dried grain solubles (DDGS), a

by-product of the distillery industry, which was shown to significantly improve milkfish growth. A dried form of the seaweed *Ulva pertusa*, when enriched with ammonium chloride increased the level of protein-nitrogen which can be a good source of protein for abalone.

## Field testing of low-cost milkfish and tilapia feeds

Alternative feed ingredients not only reduce aquaculture's demand for wild-caught fish but also provide economic benefits in reducing the cost of feeds. This year, preliminary data on



Agricultural wastes, such as mango peels, may be a future source of nutrition for feeds. PHOTO BY F AYA

the comparative performance between a commercial diet and a low-cost grow-out diet formulation by AQD has resulted in similar harvest weight in milkfish. While providing similar growth performance, the low-cost diet presented 29% savings in feed cost. Should the savings be passed on to end-consumers, alternative feed ingredients and proper formulation hold much potential to improve food security and quality among the lower-income sectors.

In the pipeline are cheaper and sustainable feed for milkfish and tilapia will be verified at various grow-out facilities of BFAR-NFRDI (Bureau of Fisheries and Aquatic Resources-National Fisheries Research and Development Institute) in the Philippines. Ingredient components such as DDGS, poultry by-product meal and PECM (protein enhanced copra meal) will be incorporated in the diets. A training course for technicians who will be involved in the project on Aquaculture Feeds and Feeding Management will be conducted prior to the start of the project, since a cost efficient feed should be complemented with appropriate knowledge and skills in feeding management.

### Online database of alternative feed ingredients

Numerous alternative feed ingredients have so far been identified and tested. However, their successful incorporation in feeds will still depend on multiple factors such as their unique nutritional values, feed preference of the target species and the ingredient's digestibility, as well as the availability and cost of the

Regional Database on Alternative Feed Ingredients in Aquaculture

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HOME SEARCH

## Search Feed Ingredients

Fed Species Feed Ingredients

Group: Select..

Common Name: Select..

Search

### Ingredient Types

Ingredient	No. of Data
Plant Seed Meal	23
Plant Leaf Meal	9
Algae marine	6
Animal By-Product	6
Mix	6
Others (Fermented)	5
Animal Snail Meal	4

### Feed Ingredients

Show 10 Rows

Feed Ingredients	Species	Stages	Actions
Alfalfa	Grass Carp	Juvenile	View
Andean lupin meal (Lupinus mutabilis Sweet)	Pacific White Shrimp	Juvenile	View
Cabbage (Brassica spp.)	Grass Carp	Fingerling	View
Canola meal	Nile Tilapia	Fry	View
Chicken viscera	Catfish	Not Determined	View
Cladophora spp.	Tiger Shrimp	Postlarva	View
Cowpea meal (Vigna unguiculata)	Milkfish	Fingerling	View
Cricket meal (Gryllus bimaculatus)	African Catfish	Not Determined	View
Defatted soybean meal	Mangrove Red Snapper	Juvenile	View
Earthworm Meal	Common Carp	Juvenile	View

Showing 1 to 10 of 72 entries

1 2 3 4 5

Regional Database on Alternative Feed Ingredients in Aquaculture

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FAQ's Sitemap Contact

Regional Database of Alternative Feed Ingredients in Aquaculture accessible at <http://afid.seafdec.org.ph>

ingredient when needed by feed processors. Because of these many factors, a comprehensive knowledge of tested alternative ingredients is needed to guide researchers and feed formulators.

During the 2014 ASEAN-SEAFDEC Regional Technical Consultation on Development and Use of Alternative Dietary Ingredients or Fish meal Substitutes in Aquaculture Feed Formulation held in Myanmar, it was recognized that such information is difficult to access. It was recommended to compile and disseminate available information on alternative feed ingredients.

After a regional workshop held in Bangkok in May 2018 which was participated in by

representatives from ASEAN member states, the Regional Database of Alternative Feed Ingredients in Aquaculture was officially launched by SEAFDEC/AQD in July 2018. The database, accessible at <http://afid.seafdec.org.ph>, is intended to serve as a reference on the different feed ingredients that, depending on cost and availability, may be used to produce cheaper feed. The database currently lists over 70 different feed ingredients along with their nutritional composition and optimal inclusion levels. Results of feeding trials on fish species is also included where available. The data have been culled from over 100 published scientific papers on fish nutrient substitutes which were found effective for commercial applications.

More alternative feed ingredients will soon be added to the database as representatives from SEAFDEC member countries have also been tasked to contribute information regarding their respective local ingredients. With further development, the public will also be invited to submit their inputs to further expand the breadth of the database. The database is a collaborative effort between SEAFDEC/AQD and SEAFDEC member countries through their representatives with funding support from the Government of Japan-Trust Fund. **a**

- RD DIANALA/ER MAMAUAG

# Chinese Consul General keen to collaborate on fisheries research

Consul General Jia Li of the Consulate of the People's Republic of China in Cebu expressed interest to promote cooperation between China and the Philippines with regards to the fisheries sector and hopes to make progress together with SEAFDEC/AQD.

Li toured SEAFDEC/AQD's Tigbauan Main station on 22 February 2019 at the sidelines of the 108th founding anniversary of the Filipino-Chinese Chamber of Commerce of Iloilo, Inc.

"After this visit, I want to promote several Chinese research centers in fisheries to get in contact with SEAFDEC to see whether we can do more for the cooperation," he said.

During his visit, the Consul General and his delegation met with SEAFDEC/AQD chief Dan Baliao and Research Division head Dr. Leobert de la Peña.

"The Consul General wants to have a collaboration between research institutes in aquaculture, in fisheries, in general, with AQD. I think he was delighted when he knew that there were some MOU between Chinese scientists and AQD, but that MOU will remain an MOU unless there'll be some proposals that will be submitted," Dr. de la Peña disclosed.

Dr. de la Peña said there is no problem with receiving funds from China as long as the collaboration is cleared with the SEAFDEC Council, particularly the Philippine government.

Meanwhile, Li invited SEAFDEC/AQD specialists to visit China. "Through these exchanges, I hope we can make progress together," he said.

"The Philippines has more than seven thousand islands and a lot of sea areas, and also China has quite



Consul General Jia Li and party visit SEAFDEC/AQD's abalone hatchery. PHOTO BY JF ALDON

a large area of sea. I think and I believe that we can do more to promote the cooperation between China and the Philippines in the sea cooperation," he added

Consul Cai Wen, Vice Consul Zhao Yiyuan, Dr. Felipe Uyongco, Mr. Vicente Tang,

Mr. Ian Eric Pama, Mr. Julian Uyongco, Mr. Roswell Uyongco, Mr. Eric Vincent Conlu, Mrs. Novee Yap and Ms. Marivic Parcon accompanied the Consul General during his visit. [a](#)

- DEVCOM

## TMS technical assistants train on prawn culture

In order to gain knowledge and technical skills on giant freshwater prawn culture, seven technical staff from SEAFDEC/AQD's Tigbauan Main Station (TMS) underwent training on "Freshwater Prawn Hatchery and Grow-out Operations."

The five-day training course began on 18 February 2019 with a brief orientation about the course. During the span of five days, the participants had lectures

on site selection, water quality management, and construction of pens, cages and ponds. The biology and genetics of the giant freshwater prawn, broodstock management, hatchery and grow-out operations were also discussed. Other topics discussed were economics and rice-prawn farming, and aquaponics.

The participants also had practical sessions on topics such as feed preparation,



Trainees learn the how-tos on disease prevention and control in giant freshwater prawn

culture of natural food organisms, and disease prevention and control.

The training was held at SEAFDEC/AQD's Binangonan Freshwater

Station (BFS) that gave the opportunity for TMS-based staff to tour around the facilities and be informed of the ongoing research projects at BFS. [a](#)

- RH LEDESMA

# Kalibo crab farmers find solutions to nursery woes

**KALIBO, Aklan** – To improve the quality of crab production and culture, SEAFDEC/AQD, in partnership with the Korean International Cooperation Agency (KOICA) and Kalibo Save the Mangroves Association (KASAMA), spearheaded a training session conducted for the local crab farmers of Kalibo, Aklan.

Marcejo Sabihon, one of the trainees, shared that while he was assigned to head the community crab farming project, he still lacked knowledge on rearing crabs. He also pointed out several problems encountered during his work in the nursery.

“We don’t monitor the frequency and amount of feeding in logbooks. We only mince the crab’s food then place it in bottles or plastic gallons. Since we just kept feeding the crabs, we find dead crabs in the morning.”

Prior to the training, participants were tasked to assess their culture area and identify problems. Other problems were identified such as the lack of canals inside the pond, acidic water, low water level, wrong design of pond gates, and debris such as wilted nipa leaves littering the pond water.

After the problems were identified, the participants were engaged in a series of lectures covering topics such as pond construction and design, water and soil quality management and proper culture methods for nursery and grow-out. They also have hands-on sessions on pond assessment, water and soil monitoring, and stocking.

## Solutions

Jon Irish Aquino, SEAFDEC/AQD associate researcher and training resource person, said that the trainees were able to find solutions to the identified problems during group exercises.

Among the solutions identified were to construct a new dike, make canals inside the pond, flush out the water and prepare the pond once more to counteract the acidic water environment.

“We will rebuild the old dike and make a canal after. We will also try to deal with the water quality and install nets along the pond perimeter so that our crabs won’t be able to escape from the pond,” Sabihon said.

Aquino also aided by providing examples of the ideal size of the screen net for



Pond water assessment. Participants were taught how to assess water quality conditions in the pond as part of their activities for the Mangrove-Crab Hatchery Training. PHOTO BY JULIANA ROSE PAGADOR

the pond, as well as providing instructions on how to build crab shelters. To counteract overfeeding, the farmers were taught how to compute the ideal amount of food based on stocking density and were tasked to keep a logbook in order to monitor feeding times.

## Livelihood

According to Maila Jamero, administrative officer of KOICA, the mangrove-crab hatchery project in Kalibo began in the year 2016 as one of the organization’s projects in collaboration with Noryangjin Fisheries Market Cooperative (NFMC) and KASAMA as part of KOICA’s efforts to aid countries in terms of livelihood.

“Since we have no idea on how to manage aquaculture, we reached out to SEAFDEC and requested a training so that we can be equipped on what to do,” said Jamero. She adds that for now, they will only continue what they have started and try to work on sustaining it for the beneficiaries’ livelihood.

“We will continue what we had started after this so that efforts and money will not be wasted. If this venture succeeds, it will really help the farmers.”

The training on Mangrove-Crab Hatchery was conducted last February 1-2 in New Buswang, Kalibo, Aklan. **a**

- DEVCOM

# Aiming for quality harvest, family of crab farmers get training

To improve the quality of their crab produce and the efficiency of their farm, a family of crab farmers signed up for a specialized training course on mangrove crab fattening at SEAFDEC/AQD which was held last 28 to 30 January 2019.

Participants were Mrs. Patria Cruz, Mr. Joseph

Patrick Cruz and Ms. Anna Diorella Cruz. Their family owns the Triple Eight Aqua Treasures Fishpond with 80 hectares of ponds in San Jose Gumi, Lubao, Pampanga growing milkfish, tiger shrimp and crabs.

“There are times that when we harvest through ‘bintol’ or traps, half of the



The Cruz family together with Mr. Caryl Vincent Genzola, Training Section officer in-charge (leftmost), Mr. Victor Emmanuel Estilo, Dumangas Brackishwater Station head (2nd from left), and Mr. Jon Irish Aquino, associate researcher (rightmost). PHOTO BY TRAINING SECTION

crab harvest is fat while the other half is not. So, we return it [to the pond]. Instead of doing this, we thought that the crab fattening training will

help us solve the problem,” Mr. Cruz said.

After seven years of operating their ponds, the Cruzes were keen on learning

Continued on next page...

the science behind the problems they experience and the ways they can improve their infrastructure and operations.

“We are also trying to find scientific explanations for why we experience mortality. We found out about the acclimatization process and the scientific correlation of salinity, temperature, pH and dissolved oxygen,” said Ms. Cruz.

Through the training, they learned that their practice of mixing crabs and shrimp in one pond, the traditional method in their locality, might be the reason behind the high mortality.

“They [SEAFDEC trainers] don’t actually recommend for the tiger prawns and the crab to

be together. So we’re also exploring if we should separate the two,” Ms. Cruz added.

The training course included lectures and practical exercises on the biology and culture of mangrove crab, *Scylla* spp., in addition to on-site exposure to a mangrove crab pond located in the Dumangas Brackishwater Station of SEAFDEC/AQD.

#### Problems with wild seed

The Cruzes also shared the challenges of sourcing crab seeds from the wild. They observed inconsistencies in the quality which also affected their production.

“For me, there is a decline in the percentage of pure *Scylla serrata* [in the wild] because before, we can get

pure *S. serrata*, but over time, there is already a mix of *S. olivacea* or *S. tranquebarica*,” Mr. Cruz shared.

Meanwhile, Mrs. Cruz noted that crab seeds were becoming more expensive and that mortality seemed to also increase.

“There was even a time that we bought a bigger size [crablets], identified as pure mud crab. When they grew, they were all *S. tranquebarica*,” she said while adding that they lost money in the process.

It was only during the training that the family found out they can source crab seed from the SEAFDEC/AQD hatchery. However, the hatchery’s current production still cannot meet the volume they need for their farm.

#### Future plans

Mrs. Cruz shared that the training gave them insights on how they can move forward with their business.

“It gave us a clearer picture where we really want to go, like to pursue crab fattening, soft-shell, and maybe later, a nursery for the mud crab,” Mrs. Cruz said.

“We intend to apply all our learnings here in SEAFDEC since it is actually applicable and really doable, it just takes time. This is to improve, as well as to correct what we are doing wrong in the pond,” she added.

The Cruzes’ ponds in Pampanga supply exporters and locals alike. Pampanga is one of the top producers of crabs in the Philippines. [a](#)

- DEVCOM

## After 5.5 years, Dr. Sugita presents final result of his AQD project

Dr. Tsuyoshi Sugita, a fish nutrition expert from the Japan International Research Center for Agriculture Sciences (JIRCAS) presented the latest findings of his experiments at SEAFDEC/AQD before returning to Japan for a new project.

His presentation is titled, “Poultry By-product Meal is an Effective Alternative Fish Meal Source in Feed for Juvenile Milkfish *Chanos chanos*: Possibility of Low Fish Oil Feed,” and was discussed in an AQD in-house seminar held on 27 February 2019 at the Tigbauan Main Station.

“How can I cut the feed cost? In short, how can I increase the income of fish farmers? I’m not a magician, so I cannot solve this problem with magic. I’m just a researcher for fish nutrition, so I try to solve the problem from the viewpoint of fish nutrition, namely, development of low or non-fish meal feed using alternative protein sources.

This is our method to solve the problem,” Dr. Sugita introduced.

During the seminar, Dr. Sugita discussed the effect of using poultry by-product meal (PBM)-based non-fish meal feed which is low in fish oil, through a growth performance test on milkfish. He compared his formulated feeds with commercial feed.

Dr. Sugita also conducted an organoleptic examination to determine if the new feed formulation will affect the taste of the milkfish. In addition, he analyzed residual antibiotics or medicines in PBM to address the issue of food safety.

“From performance, safety, and price, PBM is an effective alternative fish meal source for milkfish feed,” Dr. Sugita concluded.

#### Dr. Sugita on his SEAFDEC endeavor

After five and a half years, Dr. Sugita successfully developed a non-fish meal

feed for milkfish. In 2015, he looked for possible alternative fish meal sources produced in the Philippines while in 2016, he tested and utilized the poultry by-product meal (PBM) until he was able to determine the fish meal content ratio.

In 2017, he found out that PBM does not negatively affect the growth performance and biochemical composition of milkfish. In the final year, 2018, he completed the development of non-fish meal feed.

“Final target are feed manufacturers making and selling my fish feed formulation in the future. In 2017, I confirmed that our experimental feed can result in more growth compared to commercial feed. So, the development of non-fish meal feed for milkfish is a success. My feed has one formulation only, no need for starter, grower, and finisher. There is no need to change for the



growing stages, from juveniles and commercial size, can use the same feed,” Dr. Sugita explained.

Dr. Sugita will transfer to Hiroshima, Japan for another project under the Fisheries Research Agency (FRA) in April 2019.

Meanwhile, he said his project with JIRCAS on the “Development of Low Fish Meal Feed for Aquaculture Using Alternative Sources” will continue as he will keep on coordinating with Dr. Edward Mamauag of SEAFDEC/AQD.

“My boss will support from Japan and I will also support from Hiroshima to JIRCAS and Dr. Mamauag,” he said. [a](#)

- DEVCOM

# Participants from SEAFDEC member countries finish freshwater aquaculture training

PHOTOS THIS PAGE COURTESY OF BINANGONAN FRESHWATER STATION



Participants and SEAFDEC/AQD resource persons during the Rapid Rural Appraisal (RRA) held in Lucban, Quezon Province.

With the need to promote and disseminate freshwater aquaculture technologies within the community, SEAFDEC/AQD initiated and has been conducting an international training course on “Community-Based Freshwater Aquaculture (CBFWA)” since 2007 with funding support from the Government of Japan – Trust Fund.

The training course was organized to enhance the knowledge and skills of aquaculture extension workers on freshwater aquaculture technologies such

as broodstock development, seed production, nursery, and grow-out operations. This course also aims to help aquaculture extension workers to transfer/disseminate these technologies to the community.

Last year’s CBFWA training was attended by five (5) participants from SEAFDEC member countries coming from Indonesia (1), Myanmar (1), and the Philippines (3); which was held from 20 November 2018 to 4 December 2018 at SEAFDEC/AQD’s

Binangonan Freshwater Station in Binangonan, Rizal.

For two weeks, the participants were trained in different freshwater species’ culture technologies and project preparation as well as field work for rapid rural appraisal (RRA). The training concluded with the trainees’ presentation of a project proposal for a rural community and awarding of certificates of training during the Closing Ceremony.

“I am impressed and thankful for the new learnings I gained about the aquaculture technology

and how to communicate to rural communities and I hope that [this] training won’t be the last” said Mr. Michael E. Salandanan, one of the participants and Aquaculturist at Laguna Lake Development Authority, during the Closing Ceremony.

For the closing remarks, Dr. Maria Lourdes Cuvin-Aralar, a scientist and officer-in-charge of BFS, expressed her hopes that the learnings and techniques gained by the participants in the training will be shared to the rural community. **a**

**- R GUTIERREZ/RH LEDESMA**



The trainees actively participating in the practicals on "Freshwater Feed Formulation"



Injection of hormone during the practicals on catfish induced spawning

# SEAFDEC/AQD expert helps identify local food fish

To help distinguish similar-looking local food fish species, SEAFDEC/AQD scientist Dr. Maria Rowena Eguia served as a resource person for a segment in Unang Hirit, a local morning show in the Philippines last 1 February 2019.

“This was a good opportunity to be able to guide the fish buying public in making sure that they are not duped into buying fish

that look very similar to the fish species of their choice,” said Dr. Eguia as she identifies the difference between the *tawilis* and its look-a-like species called *salinyasi* which is being passed off as the former and sold at a premium market price.

Recap, as seen in the screencap below, of the segment can be viewed on the link <https://youtu.be/QpYJg2cZoZk?t=8612>. 

- JM DELA CRUZ



## Information Sheet

<b>TAWILIS</b> <i>Sardinella tawilis</i>	<b>SALINYASI</b> <i>Sardinella fimbriata</i>
<ul style="list-style-type: none"> <li>Known to be the only freshwater sardines</li> </ul>	<ul style="list-style-type: none"> <li>Other local name: tamban (all sardine species are locally referred to as such)</li> <li>A species of sardine from marine waters that looks like tawilis but with slightly narrow tail</li> </ul>
<b>NILE TILAPIA or PLAPLA</b> <i>Oreochromis niloticus</i>	<b>GLORIA/ARROYO TILAPIA</b> <i>Sarotherodon melanotheron</i>
<ul style="list-style-type: none"> <li>Tastier compared to other species</li> <li>Originally from Africa and was introduced to the Philippines in 1950s</li> <li>Usually raised in freshwater but can also be acclimated to brackish and marine water</li> <li>Has faint stripes on the body with red margin on the tail</li> <li>Color of the fish differs depending on the culture area e.g. darker if harvested from Taal Lake and lighter if harvested from Laguna Lake</li> </ul>	<ul style="list-style-type: none"> <li>Also originally from Africa and was unintentionally introduced to the natural waters of the Philippines. Also known as an invasive species.</li> <li>A saltwater species that adapted to the Taal Lake environment</li> <li>Has black spots on the cheeks</li> <li>Not as tasty as Nile tilapia</li> <li>Cheaper (almost half the price compared to Nile tilapia) when sold in the market</li> </ul>
<b>YELLOWFIN TUNA</b> <i>Thunnus albacares</i>	<b>MACKEREL TUNA</b> <i>Euthynnus affinis</i>
<ul style="list-style-type: none"> <li>Locally known as tambakol</li> <li>Usually the species preferred for export</li> <li>Has a common length of 150 cm which is much bigger compared to mackerel</li> <li>Has longer dorsal fin and tail</li> <li>Has a black metallic / dark blue body but with yellow and silvery speck on the belly area</li> <li>The fins and tail are also yellow in color</li> </ul>	<ul style="list-style-type: none"> <li>Locally known as tulingan or kawakawa</li> <li>Can be found in open marine waters but usually along the shoreline</li> <li>Smaller than yellowfin with an average length of 60 cm but can grow up to 100 cm</li> <li>Has a pattern of broken oblique stripes on its back</li> </ul>

## Travels funded by the Staff Dev't Committee

- Jon Irish Aquino**  
 He attended the 2nd National Bangus Congress held at the Iloilo Convention Center, Iloilo City, Philippines on 27-28 September 2018.
- Jo Anne Coronel**  
 She attended the three-day Continuing Professional Development Seminar of Tour EXCL held at Roxas City, Capiz, Philippines from 11-13 October 2018.
- Stephen Alayon**  
 He presented his paper on “Succession Planning in IAMSLIC and in Aquatic and Marine Libraries” at the 44th Annual Conference of the International Association of Aquatic and Marine Science Libraries and Information Center (IAMSLIC) in Entebbe, Uganda on 21-25 October 2018.
- Hermoso Igcasan, Jr.**  
 He attended the 43rd National Convention of the Institute of Integrated Electrical Engineers of the Philippines held at the SMX Convention Center, Mall of Asia Complex, Metro Manila, Philippines on 14-17 November 2018.
- Charmi Margaret Fernandez**  
 She attended the 8th Annual Auditor’s Forum held at the Quest Hotel & Conference Center, Cebu City, Philippines on 11-12 December 2018.

# Newly-hired Employees from December 2018 to February 2019



**ANUAR M. ASCURA**  
Pump Operator  
Engineering Section  
Administration and Finance  
Division



**ALLANA S. DELGADO**  
Information Assistant  
Library and DataBanking  
Services Section  
Training and Information  
Division



**ANTHONY ELECHICON**  
Pump Operator/Electrician  
Engineering Section  
Administration and Finance  
Division



**DENNIS M. GABINETE**  
Driver  
Engineering Section  
Administration and Finance  
Division



**ROMEO G. GARGARITA**  
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Engineering Section  
Administration and Finance  
Division



**ANGEL ANN B. JUANILLO**  
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Laboratory for Advanced  
Aquaculture Technologies  
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MARIE L. LAMASAN**  
Civil Engineer  
Engineering Section  
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Finance Division



**MICAH DANIELLE D.  
LOJERA**  
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**KYLE DYMER L.  
REGATALIO**  
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Dumangas Brackishwater  
Station  
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SANTIAGUDO**  
Draftsman  
Office of the Head  
Technology Verification and  
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SEBARILLO**  
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Engineering Section  
Administration and Finance  
Division



**ARNEL B. TABIGO-ON**  
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**ISIAH KEISH T. TORRES**  
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**ENGR. JOHN ALDRIN S.  
TUGO**  
Civil Engineer  
Office of the Head  
Technology Verification and  
Extension Division

# Celebrity vet comes to aid FishWorld turtles



Dr. Ferdinand 'Ferds' Recio, host and veterinarian, visits two of the rescued sea turtles (Esther and Mikey) at SEAFDEC/AQD's FishWorld. With him is the Officer-In-Charge of FishWorld Ms. Hananiah Pitogo. PHOTO BY JM DELA CRUZ

As part of their advocacy of airing special features on pressing environment and biodiversity issues, celebrity host and veterinarian Dr. Ferdinand Recio of GMA Network's 'Born to be Wild' visited SEAFDEC Aquaculture Department (SEAFDEC/AQD) to provide medical assistance to rescued sea turtles with fibropapillomatosis and floater syndrome last 20 February 2019.

Esther, a female green sea turtle rescued at Ajuy in Iloilo, arrived at SEAFDEC/AQD's FishWorld aquarium-museum in 2017.

"When Esther arrived in AQD, the animal was weak and had a poor appetite," said Ms. Hananiah Pitogo, Officer-In-Charge of FishWorld.

Recently, Esther had been showing progress as she slowly eats and moves more than before. However, the wart-like tumors are getting bigger and are becoming a hindrance to the turtle's movement and eating behavior.

Dr. Recio and his team filmed the removal of one of the tumors for biopsy and discussed Esther's condition with Ms. Pitogo.

Fibropapillomatosis is a specific disease to sea turtles. According to FAO (2009), it is a tumorous growth that kills sea turtles and is now affecting large numbers of sea turtles around the world. It has been hypothesized that this epidemic, which is believed to be linked to toxic ocean pollution, is affecting

the sea turtles' immune system.

Another female olive ridley turtle named Mikey has been in FishWorld for two years since he was rescued at Guimaras Island.

"Mikey has 'Floater Syndrome' which is a condition that inhibits turtles to dive for food or protection," explained Ms. Pitogo.

Dr. Recio and FishWorld staff brought Mikey to a veterinary clinic for an x-ray to see the affected organ.

More about Esther's and Mikey's stories will be featured soon in GMA-7's Born to be Wild which airs every Sunday at nine in the morning. 📺

- JM DELA CRUZ



Dr. Recio removes the tumor from Esther, a female green sea turtle, with fibropapillomatosis. PHOTO BY R PAGADOR



## **aqd matters**

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