

SEAFDEC AQD Matters

Newsletter of the SEAFDEC Aquaculture Department (AQD), Tigbauan, Iloilo, Philippines

Does resource enhancement work?

Yes, it does, and efforts made by Japan are probably the best examples in Asia and the Pacific. This was one of the presentations at the IWRESA 2014 or the *International workshop on resource enhancement and sustainable aquaculture* held 5-7 March in Iloilo City. Organized by AQD with funding from the GOJ-Trust Fund, IWRESA was attended by 172 academicians & researchers, government extensionists, the private sector, and representatives from SEAFDEC member-countries and featured 42 oral presentations and 15 poster papers.

Japan targets 80 species for sea ranching and resource enhancement with local governments (or prefectures) playing major roles in implementation. Chum salmon and scallop have the best recovery rate (2-3%) where around 1.7 billion fry were released and 50-70 million salmon returned every year. Japan's success may be attributed to major advances in stock enhancement technologies (ie. tagging, genetic mapping, numerical modeling techniques); solid policy framework; and risk mitigation protocols.

For other countries in various stages of implementing



PHOTO BY RH LEDESMA

(L-R) Plenary speaker Dr. Hitoshi Araki of Hokkaido University, workshop organizing committee chair and Deputy Chief Dr. Teruo Azuma, SEAFDEC Deputy Secretary General Mr. Hajime Kawamura, and Dr. Koichi Okuzawa of Japan Fisheries Research Agency

resource enhancement programs, the best lessons from IWRESA presentations and discussions are probably: (1) on-site hatcheries may

work best as these can ensure the use of local breeders for local waters; and (2) improving stock management and human governance to ensure that resource enhancement benefits both communities and the environment.

AQD's own efforts in resource enhancement prioritize the seahorse *Hippocampus comes*, tropical abalone *Haliotis assinina*, mudcrab *Scylla serrata*, and sandfish *Holothuria scabra*. Release strategies are still being studied.



PHOTO BY JM DE LA CRUZ

The workshop participants discuss the problems & concerns and the possible strategies related to resource enhancement and sustainable aquaculture

Dr. Trono is the new national scientist

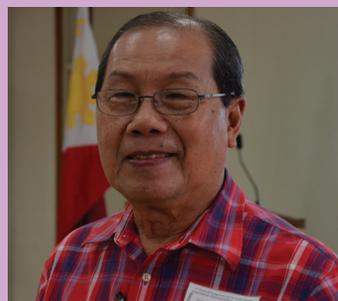


PHOTO BY RH LEDESMA

Dr. Trono during his visit to AQD in April 2013

Philippine President Benigno Aquino III has conferred on Dr. Gavino Trono Jr the title of national scientist on 13 March 2014 through Proclamation No. 737.

Dr. Trono was AQD's seaweed consultant from 1991 to 1992. He co-authored

a paper entitled New record of a marine macrobenthic algae of Panay and Guimaras Islands with AQD's Dr. Anicia Hurtado-Ponce, Dr. Nicolas Guanzon Jr and Ms. Ma. Rovilla Luhan that was published in the Philippine Journal of Science (volume 121, issue 4) in 1992.

Dr. Trono earned his PhD in Marine Botany from the University of Hawaii through an East West Center study grant. He authored the two-volume book Field Guide and Atlas of the Seaweed Resources of the Philippines which is considered by the National Academy for Science & Technology (NAST) as the most authoritative book on

seaweed flora and resources of the country today. Colleagues also consider him the "father of Kappaphycus farming." He is currently the technical consultant for FAO (Food and Agricultural Organization) seaweed culture R&D.

The selection process for a national scientist begins with NAST, an academy composed of outstanding Filipino scientists, which recommends ten candidates to the Philippine President. A scientist is defined by law as "an individual who has earned a doctoral degree in any field of the sciences" and "has demonstrated and earned distinction in independent

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“Dr. Trono...”

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research or significant innovative achievement in the basic and applied sciences, including agricultural, engineering, and medical sciences, in mathematics and in the social sciences as manifested by published works

in recognized scientific and technical journals.” Aside from the title, a national scientist is to be given financial gratuity, monthly life pension, medical & hospitalization benefits, and a place of honor at national state functions.

Since 1978, the country has 32 national scientists, including newly conferred Dr. Raul Fabella (an economist) and Fr. Bienvenido Nebres (a mathematician).

JIRCAS scientist shares study on sandfish



PHOTOS BY JG SUMBING / JIM DE LA CRUZ

(Clockwise) Dr. Watanabe prepares the Acoustic doppler current profiler for deployment at the IMTA set-up in AQD's Igang Marine Station. He is instrumental in building three facilities co-funded by JIRCAS and AQD: the sea cucumber hatchery in 2010; the IMTA experimental facility in 2012; and the mini wet laboratory at Igang in 2013

AQD visiting scientist Dr. Satoshi Watanabe of JIRCAS (Japan International Research Center for Agricultural Sciences) presented a part of his study on IMTA (integrated multi-trophic aquaculture), titled the *Estimation of energy budget of sea cucumber, *Holothuria scabra*, in integrated multi-trophic aquaculture* on 11 March at AQD's Tigbauan Main Station in Iloilo, Philippines.

IMTA is a polyculture technique that uses organisms from various trophic levels. It can help prevent environmental deterioration associated with eutrophication since excess feeds and wastes from one aquatic species (e.g. fish) serves as food or source of nutrient to another species (e.g. sea cucumber, seaweeds).

Based upon the results of Dr. Watanabe's experiments and information from literatures, the nutrient

budget of sea cucumber (*H. scabra*) cultured with milkfish (*Chanos chanos*) and seaweeds (*Kappaphycus alvarezii*) was calculated as a function of age. For example, the nitrogen requirement of a one-year old sandfish is 23.1 mg/day (or 334 mg/day milkfish feed) assuming that ingestion is 100% and digestibility is 80%. The nitrogen excretion of one-year old *H. scabra* is estimated to sustain the growth of 46 g *K. alvarezii*.



PHOTOS BY GK FAIGANI / SR NOVILLA

(Left) JIRCAS scientist Dr. Satoshi Watanabe receives a Certificate of Appreciation from AQD's research head Dr. Ma. Junemie Hazel Lebata-Ramos. (Right) Dr. Watanabe with wife Nahoko and sons Yuta and Koshi; Dr. Watanabe thanks AQD for "all the wonderful memories and the warm treatment" given to him and his family during their five-and-a-half years stay in the Philippines

Reviewing the saline tilapia manual



Workshop participants to review the molobicus manual

PHOTOS BY OF AFA / BFAR-NIFTDC



AQD scientist Dr. Eguia during the workshop (top) and Dr. Pierre Morissens with BFAR-NIFTDC director Dr. Westly Rosario

Over a hundred scientists, researchers, academicians, technicians, and fish farmers reviewed a technical manual on “molobicus”, the salt-tolerant hybrid of Nile and Mozambique tilapia. This was done during the *Workshop on the manual for the development of brackishwater tilapia technology management and protocols* held 20-21 March in Dagupan City, Philippines. The workshop was organized by DA’s Bureau of

Fisheries & Aquatic Resources – National Integrated Fisheries Technology Development Center in collaboration with the Asian Fisheries Academy.

Participants were formed into groups to discuss and review aspects of the manual on (1) hatchery & propagation, (2) grow-out, and (3) post-harvest & marketing. AQD scientist Dr. Maria Rowena Eguia, who attended for AQD, observed that this review process is very effective because experts and

stakeholders can immediately revise and add data before the manual is mass-printed.

The technology for saline tilapia culture was mainly attributed to Dr. Pierre Morissens who was acknowledged at the workshop as the “global scientist and catalyst of saline tilapia program” for his 17 years of saline tilapia research. He is with CIRAD, the French Agricultural Research Centre for International Development.

UP and AQD promote CRM book in Manila

The book *Coastal resources management: perspectives from the social sciences* was launched anew on 12 March at Ateneo de Manila University, Quezon City, Philippines for the benefit of target readers such as non-government organizations (NGOs), academe, and government agencies in Metro Manila.

Book editor Dr. Ida Siason said that the funding from DA-BAR (Department of Agriculture – Bureau of Agricultural Research) for publication was a critical assistance to authors. BAR Director Dr. Nicomedes Eleazar in turn acknowledged that CRM is a critical issue to development and encouraged all fishery stakeholders to get involved.

Representatives from NGOs and the academe were invited to give their insights on the book.

Ms. Jovelyn Cleofe of the Center for Empowerment and Resource Development noted the roles of women in fisheries & aquaculture that are discussed in the book; however, she said there are many more gender and development activities in the field that need to be documented.

Mr. Dennis Calvan of the NGOs for Fisheries Reform said that the book revealed that there are local government units still ill-prepared to fully assume responsibility for managing aquatic resources. He agreed with the book recommendation that national oversight and coordination with state institutions and supporters in civil society should be established for CRM.

Dr. Marie Antonette Meñez of UP (University of the Philippines) Diliman – Marine

Science Institute pointed out that the book included market mechanisms within the CRM framework but there is still information asymmetry, that is, small-scale fishers often have less market knowledge, and this needs to be addressed to empower fishers

The book was first launched on August 2013 at UP Visayas, Iloilo City. AQD scientist Dr. Nerissa Salayo is one of the chapter authors who wrote about market and fisheries development.



(Clockwise) Book editor Dr. Ida Siason; chapter authors Prof. Elmer Ferrer, Prof. Pepito Fernandez, Prof. Alice Prieto-Carolino, Dr. Nerissa Salayo, and Prof. Rodelio Subade; not in the picture is Prof. Lenore Polotan-de la Cruz



(L-R) Book reviewers Mr. Dennis Calvan, Ms. Jovelyn Cleofe and Dr. Marie Antonette Meñez

PHOTOS BY OF GH GARCIA/ JIM DELA CRUZ

Aquaculture seminars

On lake management



LAKE TOUR. (Left) Dr. ML Aralar [in red cap] at Pandin Lake with the members of the the *Samahan ng Kababaihan Mangingisda at Bangkera sa Lawa ng Pandin* and at Yambu Lake

PHOTOS COURTESY OF ML ARALAR

AQD, represented by scientist Dr. Maria Lourdes Aralar, attended the *Integrated Lake Basin Management (ILBM) seminar and workshop* with the theme “Heartware Cases in Asia: Learning from the Philippine Experience” on 3-5 March 2014 at San Pablo City, Laguna.

According to Dr. Aralar, “heartware” is a coined term which implies that human

sentiments such as mutual concern for others, respect for traditional values and culture, long-term historic memories for the community interacting with nature and similar sentiments collectively form an essential part of the concept of lake basin governance and ILBM.

A series of presentations on Philippine lakes including water quality monitoring, environmental issues &

concerns and action plans were given by selected participants. It was then followed by presentations on Lake Chilika in India and lakes in Indonesia.

The seminar-workshop was organized by International Lake Environment Committee, the Center for Sustainability and Environment in Shiga University (Japan) and Laguna Lake Development Authority (Philippines).

On species extinction prevention



(Left) Freshwater flora & fauna group during discussion and Dr. ML Aralar presenting the group's output

PHOTOS COURTESY OF ML ARALAR

With the objectives of identifying more threats surrounding prevention of species extinction, AQD took part in re-drafting the Philippine Biodiversity Strategy and Action Plan (PBSAP) 2025 on 13-14 March 2014 in Quezon City. Strategies & actions and targets & indicators were also put forward as an annex to PBSAP.

During the workshop, the areas of concern are (1) terrestrial fauna, (2) terrestrial flora, (3) marine fauna, (4) marine flora and (5) freshwater flora, fauna & fungi. AQD scientist Dr. Maria Lourdes Aralar, together with the group assigned to the freshwater flora & fauna, reviewed the related literature on species conservation action plans and also the most recent draft of PBSAP 2025.

According to Dr. Aralar, one of the major concerns that were highlighted in all areas is the updating of the status of the Philippine species on the International Union for Conservation of Nature red list since the website were only based on the data from the 90s.

The workshop was organized by the Department of Environment and Natural Resources – Biodiversity Management Bureau.

On Future Earth, Future Philippines

Over a hundred researchers and scientists discussed action plans and research programs during the 81st National Research Council

of the Philippines’ (NRCP) General Membership Assembly and Scientific Conference on 26-27 March at Metro Manila.

With the theme “Future Earth, Future Philippines”, the presentations and lectures were focused on (1) atmospheric & environmental change, (2) health & human well-being, (3) marine & aquatic ecosystems, (4) terrestrial ecosystem, and (5) economic transformation towards sustainable development. This thrust was

stimulated by the devastation experienced by our country due to natural disasters.

After the workshop, an oath-taking took place for new associate and regular members of NRCP. AQD associate scientist Dr. Frolan Aya and associate researcher Mr. Mark Nell Corpuz took an oath as new associate members. Dr. Maria Lourdes Aralar, Dr. Nerissa Salayo and Dr. Maria Rowena Eguia were also present during the event.



Dr. FA Aya (right) and Mr. MN Corpuz (second from right) during the oath-taking [PHOTO BY ND SALAYO]

AQD conducts mangrove course for POs, LGUs and NGOs



PHOTOS BY OF RF BOMBEO / EVANTOLINO

“The training has taught us to be more confident and has given us the right technical knowledge on how to plant mangroves the right way, in which we will be able to save money, time and manpower,” said Ms. Brenda Grafil, an agricultural technologist of Gen. MacArthur, a town in eastern Samar.

Ms. Grafil together with 19 other participants completed the four-day *Mangrove conservation, management and rehabilitation* course on 14 March. The participants were from people’s organizations (POs), eastern Samar local

government units (LGUs) and non-government organizations (NGOs). The course had lectures on mangrove biology and ecology, taxonomy, and community structures with corresponding field work held in Ajuy, Iloilo and Ibajay, Aklan.

The training was part of the environmental rehabilitation project (with focus on marine protected areas and mangroves) of Foundation for the Philippine Environment. It was carried out in collaboration with the Zoological Society of London-Philippines and AQD.



Participants identify mangrove species in Ibajay, Aklan (top-left). Trainees learn proper outplanting (top) and bagging of mangrove seedlings

Kenyans train on seaweeds and aquafeeds



PHOTOS BY OF R LACIERDA / RT BAUTISTA

Selection of seaweed stock for planting (left) and culture of *Kappaphycus* using the bamboo raft method

The specialized training courses on *Seaweed farming and Aquafeed formulation and preparation* were organized simultaneously by AQD from 19 March to 1 April with funding from the WorldBank through the Kenya Coastal Development Project.

The seaweed course included lectures on seaweed industry status, biology & taxonomy of seaweeds, nursery & grow-out culture among others. There were also practical activities such as preparation of culture materials & media, production of micropropagules, land-based nursery culture, planting of seaweeds, and preservation

& identification of seaweeds. Although organized mainly for two staff of the Kenya Marine Fisheries Research Institute (KMFRI), two more trainees joined from Singapore and Philippines. Mr. James Anyango of KMFRI said that they have gained a lot of technical knowledge, both theoretical and practical.

The aquafeed course had lectures on nutrient requirements, feed formulation, feeding habits & behavior, apparent digestibility measurement, and economics of feeding, among others. There were also practical sessions on feed preparation, evaluation of formulated

diets through a feeding experiment, and proximate analysis of feeds. On behalf of his five co-trainees from Kenya and Philippines, Mr. Agwata Ototo, also of KMFRI, expressed appreciation to AQD for meeting their training expectations. “I am very grateful for the experience that I have here; we wanted a training that will transform the academic knowledge that we have into practice and indeed we achieved it here. When we go home, I am sure that we can apply what we have learned in the actual production of feeds,” he said.

NFRDI partners with AQD for library establishment



(Above) Course participants during the seminar proper. (Far-left to right) Senior information assistant Mr. DL Superio, library and data banking services section head Mr. SB Alayon and information assistant Mr. ES Nemiz [PHOTOS COURTESY OF BFAR-NFRDI]

B FAR-National Fisheries Research and Development Institute (NFRDI) invited AQD to conduct a three-day *Seminar-workshop on data management in preparation for the establishment of an institutional library* for its division chiefs and senior officers on 28-30 April at Metro Manila, Philippines.

NFRDI's marine fisheries research division officer-in-charge, Ms. Elsa Furio expressed their need for a functional and effective library to provide the researchers

with relevant materials and information during her message at the opening ceremony.

AQD's library and data banking services staff with head Mr. Stephen Alayon, senior information assistant Mr. Daryl Superio & information assistant Mr. Elvi Nemiz served as speakers for the seminar and training section's information assistant Ms. Richelle Bautista as course officer. They gave presentations on AQD library's services & initiatives and lectures on (1) proper citation

style & format, (2) citation management, (3) digital libraries & repositories, and (4) databases & information sources for fisheries and aquaculture. After the lecture, the participants did a workshop on the development of NFRDI library.

Mr. Alayon also shared that "the library services in AQD had reduced the work load of researchers and scientists by expediting their literature search activities for them – giving them more time to focus on their technical functions".

Mangroves and beyond!



(Top) Tigbauan shoreline soon-to-be a beach forest; AQD staff during the mangrove planting activity [PHOTOS BY IT TENDENCIA / KD ABROGUENA]

Government agencies, non-government organizations & agencies, private institutions and academe gathered for *Semana sang Iloilo mangrove planting activity and launching of beach forest project* led by the Iloilo Provincial Government in cooperation with the Municipality of Tigbauan on 5 April.

Over 2,000 participants, including 10 from AQD, planted 5,000 mangrove seedlings at the coastal area of Barangay 9, Poblacion to kick off the beach forest project. Beach forests can prevent coastal erosion and provide protection to coastal areas from devastating storm surges similar to those brought about by typhoon Haiyan in November 2013. .

This event is in support Action for Re-greening and Transformation for Climate Change Adaptation Program in celebration of the 113th founding anniversary of Iloilo



CONGRATULATIONS GRADUATES!

Rose Margaret Albacete, chemist at Laboratory Facilities for Advanced Aquaculture Technologies finished MS Chemistry at the University of the Philippines-Visayas

Joseph Biñas, senior technical assistant at Nutrition and Feed Development Section finished MS Biology at the University of the Philippines-Visayas

Aubrey Burlas, senior technical assistant at Fish Health Section finished MS Aquaculture at the University of the Philippines-Visayas

Michael Ray Burlas, technical assistant at Breeding and Seed Production Section finished MS Aquaculture at the University of the Philippines-Visayas

Gelyn Faigani, information assistant at Devcom Section finished MS Development Communication at the University of the Philippines-Open University

Joana Joy Huervana, technical assistant at Breeding and Seed Production Section finished MS Aquaculture at the University of Philippines-Visayas

Schedar Rose Novilla, senior technical assistant at Farming Systems and Ecology Section finished MS Aquaculture at the University of Philippines-Visayas

Elisa June Pagtanac, administrative assistant 2 at Igang Marine Station finished MS Business Management at the University of the Philippines-Visayas

Angela Denise Bilbao, technical assistant at Fish Health Section finished BS Food Technology at the University of the Philippines-Visayas

May Therese Albacete, sister of chemist **Rose Margaret Albacete**, finished Medicine degree at West Visayas State University

Leander Antonil, brother of janitor **Leocel Antonil**, finished BS Civil Engineering at University of Rizal System

Eric Abalajon, brother of administrative assistant 3 **April Abalajon-Nievaes**, finished BA Sociology at the University of the Philippines-Visayas

Jolyn Amihan, son of senior technical **Jorge Amihan**, finished BS Marine Engineering at Western Institute of Technology

Mary Dianne Grace Arnaldo, daughter of senior technical assistant **Gemma Arnaldo**, finished BS Fisheries as college scholar at the University of the Philippines-Visayas with an award of "Best Student in Aquaculture"

Jetro Babiera, son of technical assistant **Jerry Babiera**, finished BS Information Technology at Western Visayas College of Science and Technology

Diana Kristina Junio, daughter of administrative assistant 2 **Merlinda Junio**, finished BS Information Systems at West Visayas State University

Ferre Con Ocampo, daughter of aide **Conrado Ocampo**, finished BS Elementary Education at West Visayas State University

Natalie Diane Opiña, daughter of research assistant **Noel Opiña**, finished BS Food Technology at the University of the Philippines-Visayas

Adonis Go Tibudan Jr, son of financial assistant **Mary Lou Tibudan**, finished BS Information Technology at the University of San Agustin

Misty Ann Tortosa, daughter of agency-hired personnel **Francisco Tortosa**, finished BS Special Education at West Visayas State University

Joshua Bernadas, son of carpenter/technician **Jose Bernadas**, finished high school at Nueva Valencia National High School
Michael Angelo Celebre, son of aide **Ricardo Celebre**, finished high school as 2nd honorable mention at Talim Island Academy

Jean Heriel Gerolaga, daughter of genset operator **Ariel Gerolaga**, finished high school at Catalino Salazar National High School

Henry Maurice Gomez, son of human resource management section head **Atty. Gina Gomez**, finished high school as third honorable mention at Oton National High School with awards on leadership, music and service

Ryan Lazartigue, son of technician **Benito Lazartigue**, finished high school at Talim Island Academy

Laurence Glenn Morales, son of technician **Jose Ramel Morales**, finished high school at Simeon J. Jabasa National High School as Artist of the Year, Boy Scout of the Year, Dancer of the Year and an award for service

Jacob Portalibre, brother of administrative assistant 1 **Ruth Portalibre**, finished high school at Tigbauan National High School

Michael Nelson Samoranos, brother of technical assistant **Mark Neil Samoranos**, finished high school at Mahabang Parang National High School

June Francis Tortosa, daughter of agency-hired personnel **Francisco Tortosa**, finished high school at Guimbal National High School

Justine Ardales, daughter of technician **Nestor Ardales**, finished elementary at Bungso-an Elementary School

Van Simon Jatulan, son of administrative assistant 1 **Vivian Jatulan**, finished elementary at Binangonan Elementary School

Nicole Franzeen Mallare, daughter of senior technical assistant **Mae Mallare**, finished elementary at Kinaadman Elementary School, Inc.

Lariane Francis Morales, daughter of technician **Jose Ramel Morales**, finished elementary with honors at Pandaraonan Elementary School

Jennifer Ocampo, daughter of aide **Conrado Ocampo**, finished elementary as salutatorian at Buyu-an Elementary School with awards as Athlete of the Year and Outstanding Pupil of Tigbauan

Mary Rose Pagador, daughter of senior information assistant **Rosenio Pagador** and researcher **Gregoria Pagador**, finished elementary as valedictorian at the University of San Agustin

David Portalibre, brother of administrative assistant 1 **Ruth Portalibre**, finished elementary as third honors at Tigbauan Central Elementary School with awards as Champuter of the Year and Outstanding Pupil of Tigbauan

Nicole Reyes, daughter of technician **Federico Reyes**, finished elementary as 2nd honorable mention at Pipindan Elementary School

Maria Mercedes Asuncion Bayona, daughter of senior technical assistant **Nestor Bayona**, finished pre-school at San Antonio San Nicolas Elementary School

John Nico Salvador Gamuza, son of senior technician **Armando Gamuza**, finished pre-school at Buyu-an Elementary School with an award Best in Numbers

Vashti Tesorero, daughter of senior technician **Michael Tesorero**, finished pre-school at Barotac Nuevo Elementary School

Research seminar



(Top) AQD's technical assistant Ms. HT Sollesta during her presentation; (right) AQD staff attended the research seminar [PHOTOS BY JM DE LA CRUZ]



Ultrastructure of healthy and ice-ice infected *Kappaphycus alvarezii* (Doty) Doty

Hananiah Sollesta
Maria Rovilla Luhan
Norwell Brian Bautista

K*appaphycus alvarezii* is the most cultured seaweeds in the Philippines. There has been a decline in the country's seaweed production due to persistent occurrences of ice-ice disease and epiphyte infestation. This study aimed to describe ultrastructure of healthy and ice-ice infected *Kappaphycus alvarezii*. Samples were processed for

ultrastructure observation. The presence of rod-shaped bacteria, thinner cell walls, shrinking cell nucleus and thicker plasma membrane were observed in infected seaweeds, which were not observed in healthy samples. This suggests that the presence of the rod-shaped bacteria in *K. alvarezii* caused the changes in cell wall, plasma membrane and size of nucleus.

Of building leaders

AQD became the venue of the Ten Outstanding Students of the Philippines-Western Visayas (TOSP-Western Visayas) Bayan-i-Serve activities on 21-22 April.

The TOSP Regional Executive Committee met the 2014 regional candidates for formation and team-building activities.

TOSP is an awards program seeking young role

models of the country who have personified academic excellence, exemplary leadership and deep sense of social responsibility, all anchored on good moral values.

(Below) TOSP regional candidates during the formation activities [PHOTOS BY RH LEDESMA]



AQD Matters

is published monthly by the Development Communication Section, SEAFDEC Aquaculture Department, Tigbauan, Iloilo, Philippines

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