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BAR is 3rd top performer

BAR Director Nicomedes Eleazar, together with BAR-Program Development Division Assistant Head Cynthia Remedios de Guia and BAR-Finance Head Judith Maghanoy, receives the award from Department of Agriculture (DA) Secretary Emmanuel Piñol and DA Undersecretary for Operations Ariel Cayanan. PHOTOS COURTESY OF CRDEGUIA

The Bureau of Agricultural Research (BAR) ranked third among the top performers of the Department of Agriculture (DA) in terms of obligations for the fiscal year 2018.

BAR scored a total of 99.85 percent utilization rate next to the DA implementing units from the Ilocos and Bicol regions with 100 percent and 99.94 percent, respectively.

DA Secretary Emmanuel Piñol awarded the plaque of recognition to BAR on 8 February 2019 at the Bureau of Soils and Water Management (BSWM) Hall, Quezon City during the DA's Annual Assessment Meeting. Joining Secretary Piñol were DA Undersecretary for Operations Ariel Cayanan and Financial Management Service Director Miriam Cornelio.

According to Secretary Piñol, such recognition to the performance in terms of physical and financial aspects of each operating unit of the DA is a means to boost and encourage all DA units to meet or exceed the targets set on a quarterly and annual basis. The DA chief also emphasized the intergenerational responsibility of the DA public servants to "ensure food security now and in the future for the Filipinos."

BAR Director Nicomedes Eleazar, with budget and finance staff Judith Maghanoy and Cynthia Remedios de Guia received the award. ### ***(Daryl Lou A. Battad)***

BAR is 2018 overall highest performer in HVCDP

The Bureau of Agricultural Research (BAR) was awarded as the "2018 Over-all Highest Performer" (Attached Bureau category) in the implementation of projects under the High Value Crops Development Program (HVCDP). The award was given during the Fourth Quarter National Assessment of the HVCDP held on 28 January-1 February 2019 in Dipaculao, Aurora.

Receiving the award in behalf of Director Nicomedes Eleazar were Candice Guilaran and Matthew Janssen Ty, technical staff and HVCDP focal persons of BAR's Program Development Division. Giving the award was Department of Agriculture (DA) Undersecretary for High Value Crops and Rural Credit Evelyn Laviña.

The four-day national assessment and planning workshop was conducted to evaluate the status of implementation

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DA, IRRI sign MoU to strengthen rice industry

Department of Agriculture (DA) Secretary Emmanuel Piñol (left) and International Rice Research Institute (IRRI) Director General Matthew Morrell (right), along with DA Undersecretary Segfredo Serrano and IRRI Chief of Staff Peter Brothers (standing), sign the DA-IRRI Memorandum of Understanding. PHOTO: JALAXAMANA

With the goal of ensuring food security and sustainability of the rice industry in the Philippines, a Memorandum of Understanding (MoU) was signed between Department of Agriculture (DA) Secretary Emmanuel Piñol and the International Rice Research Institute (IRRI) Director General Matthew Morrell on 13 February 2019 at DA OSEC Conference Room, Diliman, Quezon City.

Joining the MoU signing were DA Undersecretary Segfredo Serrano, IRRI Chief of Staff Peter Brothers, and IRRI Platform Leader, Dr. Ajay Kohli.

After the ceremonial signing, a press conference was held, in which issues on decreasing productivity and focus levels of rice farmers were addressed in connection with the reasons as to why the Philippines could not achieve that long-dream of rice self-sufficiency. This led to DA's partnership with IRRI, the world's premier research organization dedicated to reducing poverty and hunger through rice science, with the hope that such collaboration will improve the rice farmers' productivity and rice competitiveness in the country.

Improved water management systems and high-yielding variety of good seeds, as stated within the scope of the Memorandum of Understanding, were some of the goals for this year as strategies to achieve the country's

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This publication provides regular updates on DA-BAR's activities as the country's national coordinator for agriculture and fisheries R&D. It also highlights features and news articles concerning NaRDSAF-member institutions.

PRODUCTION TEAM

Editor: Rita T. dela Cruz
Consulting Editor: Julia A. Lapitan
Managing Editor/Layout: Rena S. Hermoso
Writers: Clarisse Mae N. Abao, Ma. Eloisa H. Aquino, Daryl Lou A. Battad, Rita T. dela Cruz, Leoveliza C. Fontanil, Gladys B. Gammad, Ephraim John J. Gestupa, Candice M. Guilaran, Rena S. Hermoso, Jireh Alodia R. Laxamana, Patrick Raymund A. Lesaca, and Matthew Janssen C. Ty
Reproduction: Ricardo G. Bernardo
Circulation: Lyn D. Pardilla and Lino Norman D. Reyes
ACD Head: Julia A. Lapitan
Advisers: Dr. Nicomedes P. Eleazar, *CESO IV, Director*
Digna L. Sandoval, *OIC-Assistant Director*

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For subscription and inquiries, please contact us at: Tel. Nos. +63 (2) 461-2800 or 461-2900 local nos. 1136, 1143, 1139, 1138 Fax No. +63 (2) 927-5691 Email: *acd@bar.gov.ph*
Articles are also available online, visit our official website: http://www.bar.gov.ph/barchronicle
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First RM meeting held

INSET: BAR Director Nicomedes P. Eleazar welcomes the participants and provides them a brief rundown on some of the important activities of the bureau that transpired in the previous year.

PHOTOS: RDELACRUZ

To ensure that research and development (R&D) projects and activities are being smoothly implemented and are in line with the thrusts and priorities of the Department of Agriculture (DA), the Bureau of Agricultural Research (BAR), as the lead coordinating agency for agriculture and fisheries R&D, conducted the "First Quarter Research Management (RM) Meeting" on 7 February 2019 in Quezon City.

Attending the meeting were Regional Technical Directors (RTDs) for research, and research managers from the different Research Divisions of DA-Regional Field Offices (RFOs) and DA-Bureau of Fisheries and Aquatic Resources (BFAR) Regional Offices. Also present were representatives from various R&D implementing attached agencies and staff bureaus of DA including the Agricultural Training Institute (ATI), Bureau of Animal Industry, Bureau of Soils and Water Management, Philippine Carabao Center, Philippine Rice Research Institute, Philippine Center for Postharvest Development and Mechanization, Philippine Fiber Industry Development Authority, and Philippine Rubber Research Institute.

BAR Director Nicomedes P. Eleazar welcomed the participants and provided highlights of accomplishments and major activities of the bureau in 2018. He reiterated important points including the intensified complementation of R&D programs through initiated and organized activities with various agencies such as the harmonization meetings among state universities and colleges, ATI, and Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development; revitalization of the Regional Research Development and Extension Network (RRDEN) on agriculture and fisheries; and participation in an inter-agency program under Global Innovation Policy Accelerator (GIPA) Programme.

Dr. Eleazar informed the group about the two successfully conducted major activities of BAR in 2018, the 30th National Research Symposium (NRS) and the 14th Agriculture and Fisheries Technology Forum and Product Exhibition. "We received 176 entry papers for the NRS, the highest number of entries received by far. Likewise, we were able to return to SM Mega Trade Hall as an exhibit venue accommodating up to 7,000 registered participants, guests, and walk-in visitors," he said. He also mentioned the major training workshops conducted to capacitate not just the bureau but the entire R&D sector. "These training workshops have capacitated our agencies towards enhancing the manpower resource of the NaRDSAF member agencies," he added.

As one R&D family with a unified vision, he reminded the regions and partners to work effectively in performing the tasks and achieve the targets of the sector for the next quarter.

The RM Meeting is a quarterly activity conducted and organized by BAR through its Program Monitoring and Evaluation Division. ### ***(Rita T. dela Cruz)***

DA, IRRI sign...from page 2

target production in agriculture. Correlatively, the Bureau of Agricultural Research (BAR), as the research and development (R&D) coordinating arm of DA, will play a crucial part in this endeavor.

As one of the key partners of IRRI, BAR, together with the DA Rice Program, DA-Regional Field Offices, Philippine Rice Research Institute, Agricultural Training Institute, Bureau of Plant Industry, Bureau of Soils and Water Management, Philippine Center for Postharvest Development and Mechanization, and other DA R&D implementing agencies, has been supporting rice projects that are vital to information generation and technology development.

Among these R&D rice projects include Philippine Rice Information System Management, Rice Crop Manager, Pest Risk Identification and Management (PRIME), Next Generation (Next-Gen) Rice Varieties, Capability Enhancement of the Next Generation of Rice Extension Professionals and Farmer Intermediaries (IPaD Project), Water-efficient and Risk Mitigation Technologies, Heirloom Rice/ Philippine Specialty Rice, Sustainable Rice Straw Management Practices and Technologies, Strengthening the Capability of the RDE Partners of Climate Ready Information and Technologies to Rice-based Farming. ### ***(Jireh Alodia R. Laxamana)***

UPLB Technology Hub and One-Stop Shop inaugurated

UPLBFI Executive Director Casiano S. Abrigo, BAR Director Nicomedes P. Eleazar, UPLB Chancellor Fernando C. Sanchez, Jr., and UPLB Vice Chancellor for Research and Extension Rex B. Demafelis lead the ceremonial ribbon cutting during the inauguration of the UPLB Technology Hub and One-Stop Shop.

The University of the Philippines Los Baños (UPLB) through the Office of the Vice Chancellor for Research and Extension (OVCRE) and the UPLB Foundation, Inc. (UPLBFI) inaugurated the UPLB Technology Hub and One-Stop Shop funded by the Bureau of Agricultural Research (BAR) on 6 February 2019.

The techno hub and one-stop shop aims to promote product, process, and information as it houses various agricultural technologies and information products of UPLB generated through research and development (R&D). The facility also features three meeting rooms for other related functions, and will be open for students and public use.

Present in the inauguration activity were BAR Director Nicomedes P. Eleazar; UPLB Chancellor Fernando C. Sanchez, Jr.; Vice Chancellor for Research and Extension Rex B. Demafelis; Vice Chancellor for Planning and Development Marish S. Madlangbayan; and UPLBFI Director Casiano S. Abrigo. Also in attendance were Assistant to the Vice Chancellor for Planning and Development, Engr. Gregorio S. Pascal; OIC of the University Planning and Maintenance Office, Engr. Marloe B. Sundo; and the UPLB Inspection Team, Arch. William Jeffrey Y. Rañola and Arch. Joselito P. Cruz.

During the inauguration ceremony, Dr. Demafelis, project proponent, emphasized how the technohub and one-stop shop will house the products and technologies of the university and will serve as a venue for emerging concepts and innovations for the UPLB constituents.

BAR Director Eleazar commended the initiatives of UPLB to continuously exert efforts in bringing the technologies and innovations to the stakeholders – which is the main reason behind the conduct of research. Moreover, he mentioned that the facility will also serve as the home for local products of the university from newly devised technologies to information and educational materials for various stakeholders. "I am highly hopeful that this facility will be filled with various research products for this university is the home for competent experts from agriculture, chemistry, food technology, etc. These researches shall reach the public and provide them the greatest advantage for the satisfaction of their needs and their livelihood," said Director Eleazar.

The project is funded under the bureau's Institutional Development Grant Program. ### ***(Clarisse Mae N. Abao)***

BAR is 2018...from page 1

of HVCDP projects by DA-Regional Field Offices, and staff bureaus and attached agencies by presenting the physical and financial targets and accomplishments in 2018, and targets for 2019.

The DA-HVCDP, led by Usec. Evelyn Laviña, facilitated the activity. In attendance were planning and budget officers of the DA's attached agencies, staff bureaus, and regional field offices (RFOs).

Other agencies awarded were DAF-ARMM (overall highest performer), DA-RFO 2 (second overall highest performer), and DA-RFO 1 (third overall highest performer) for the RFO category. ### ***(Candice M. Guilaran and Matthew Janssen C. Ty)***

Eleazar attends RRDEN consultative meeting in Bicol

BAR Director Nicomedes Eleazar delivers his message during the RRDEN consultative meeting on 12 February 2019 in Naga City. PHOTO: MEAQUINO

Dr. Nicomedes Eleazar, director of the Bureau of Agricultural Research (BAR), attended the First Consultative Meeting of the Regional Research Development and Extension Network (RRDEN) in Region 5 on 12 February 2019 at Avenue Plaza Hotel, Naga City.

In his message, Dr. Eleazar underscored the importance of the activity in providing a venue for comprehensive and holistic planning of programs of the RRDEN; gathering insights, and recommendations; and discussing complementation of RD&E activities in view of the revitalization of the Network. He informed the group that, proposals packaged by state universities and colleges (SUCs) should be endorsed by their respective RRDEN and encouraged RRDEN members to provide their respective inputs in the Memorandum of Understanding to clearly define and understand the roles of each agency.

In response, Dr. Edgar Madrid, regional technical director for research of the Department of Agriculture-Regional Field Office (DA-RFO) 5, said that "we would like to formalize our bond in RRDEN, this does not mean however that you will be under the umbrella of RRDEN. The network will be a facilitative/consolidating body in the region for agri-fisheries RDE undertakings. It will provide an avenue for the exchange of information among research institutions leading to a more unified approach in research and development."

Present during the activity were head of agencies and representatives from the various sectors of DA-RFO 5 including the national government agencies, local government units, and SUCs.

Luz Marcelino, research division chief of DA-RFO 5, presented the general guidelines and procedure for the operation of the RRDEN.

To show their support to the revitalization of RRDEN, the participants signed at the Commitment Wall to pledge their commitment in ensuring the efficient use and utilization of resources in the RDE programs through the complementation within the Network.

Revitalized and launched in August 2018, RRDEN is composed of 16 networks from various DA-RFOs and is being coordinated under the guidance of BAR to develop and maintain a network of regional and provincial collaborators in their RDE programs. It serves as a vehicle to systematically develop and implement a regional RDE agenda and program for agriculture and fisheries. ###

(Ma. Eloisa H. Aquino)

BAR, SEARCA hold 1st batch of 2019 Financial Viability Training

To capacitate the R&D implementers and project leaders from partner-institutions, particularly in identifying the improve viable technologies towards agri-fishery enterprise, the Bureau of Agricultural Research (BAR), in partnership with the Southern Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), spearheaded the conduct of the first batch of training program on Financial Viability and Profitability Analysis of Agricultural Technologies and Emerging Enterprises. The training-workshop which was held on 18-23 February 2019 in Los Baños, Laguna, consisted of soybean project implementers as participants.

Participants of the 2019 Financial Viability Training in a photo opportunity with BAR Director NIcomedes P. Eleazar (6th from right) PHOTO: LFONTANIL

The training-workshop aimed to serve as a venue for knowledge and enhance learning exchange for the participants and to provide them with the most common methods and tools in determining the profitability in various farming and agricultural value-adding processing technologies.

Project leader and SEARCA consultant, Dr. Corazon T. Arazon provided the training mechanics for the participants and served as the lecturer on cost and return analysis, financial cash flow analysis and

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2nd Face-to-Face Session for IKM batch 2 conducted

The second batch of IKM Mentorship Program during an activity. PHOTO: DLBATTAD

The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), in collaboration with the University of the Philippines Los Baños-College of Development Communication (UPLB-CDC), conducted its 2nd face-to-face session for the Information and Knowledge Management (IKM) Mentorship Program on 27 February-1 March 2019 at the SEARCA Headquarters, Los Baños, Laguna.

The participants were composed of research and information officers from the Bureau of Fisheries and Aquatic Resources regional offices and attached agencies and staff bureaus of the Department of Agriculture.

Julia A. Lapitan, head of the Applied Communication Division of the Bureau of Agricultural Research (BAR), graced the event in behalf of BAR Director Nicomedes P. Eleazar. In her message, Lapitan emphasized the importance of IKM and the role of the learners in promoting IKM in their respective agencies, saying that "knowledge needs to be accessed, used, and reused, not only internally, but most importantly, externally, where our R&D clients are involved." She added that this mentorship program was launched to "build effective IKM practitioners and experts, one agency at a time."

Likewise, SEARCA Program Specialist for Project Development and Technical Services Nancy M. Landicho shared the message of Dr. Fernando C. Sanchez, Jr., chair of the SEARCA Governing Board. She stated, "we

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BAR receives plaque of recognition from UE

The University of the East (UE) awarded the Bureau of Agricultural Research (BAR) a plaque of recognition during the opening ceremony of the UE CAMANAVA Studies International Conference held on 8-9 February 2019 at the UE-Caloocan campus.

BAR's technical staff from the Applied Communication Division Daryl Lou Battad received the plaque of recognition in behalf of BAR Director Nicomedes Eleazar.

Now on its fourth year, the conference is a higher education forum led by the UE Caloocan's College of Arts and Sciences promoting basic and applied research in various disciplines such as arts, humanities, and the sciences. The two-day conference featured paper presentations from high-caliber scientists, academicians, researchers, and students from different local and international partner-institutions, both from private and public sectors.

This year's conference theme, "Assuring quality education for sustainable development" was anchored on the United Nations' Sustainable Development Goal 4, which is to "ensure inclusive and quality education for all and promote lifelong learning."

Vice President and President-elect of Maejo University Dr. Weerapon Thongma served as the keynote speaker. In his speech, he emphasized Northern Thailand's education system geared towards sustainable tourism, promoting corporate social responsibility.

BAR, in its unwavering interest in the application of scientific knowledge to enhance awareness and knowledge management, co-sponsored the activity through its Scientific Publication Grant. ### ***(Daryl Lou A. Battad)***

Series of training on Edible Landscaping held


Maria Aurora, Aurora Province


Claver, Surigao del Norte


Ipil, Zamboanga Sibugay


PHOTOS: GGAMMAD

Baguio City, Benguet

To widely promote the technology on Edible Landscaping (EL), the University of the Philippines Los Baños (UPLB), through its EL Team, held a series of hands-on training in Maria Aurora, Aurora Province (8-9 January); Claver, Surigao del Norte (16-17 January); Ipil, Zamboanga Sibugay (30-31 January); and Baguio City, Benguet (6-7 February). These trainings were requested by the Department of Tourism (DoT) Regional Office CAR; Department of Agriculture-Regional Field Office (DA-RFO) 9; Aurora State College of Agriculture and Technology; and The Valley Cathedral Christian Church in Capangdan, Claver, Surigao del Norte.

The UPLB EL Team has been the Bureau of Agricultural Research's (BAR) active partner in its initiatives on EL since 2010. Funded by BAR, through its National Technology Commercialization Program, the EL Team was able to provide assistance to communities through implementing and establishing their own edible landscape gardens in their backyards.

EL is a new approach that merges science and creativity together to form a revolutionary crop production technology. It gives a twist in the conventional crop production as the basic tenets of landscape designing become its guiding principle. Compared with conventional landscaping, EL utilizes vegetables, fruits, medicinal plants, herbs as major plant materials.

In a statement, BAR Director Nicomedes P. Eleazar shared that, EL sites can be adopted not only in the backyards but it can also serve as agri-tourism sites that can be established in schools, offices, municipal halls, among others. Hence, it creates and establishes linkages among institutions including the government, private sector, and other

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BAR, SEARCA hold...from page 5

sensitivity analysis. Including in her discussions was the use of quantity indicators, discounted measures and switching values techniques.

Financial viability expert from UPLB, Dr. Cesar B. Quicoy discussed the partial budget analysis and break-even analysis while SEARCA consultant and UPLB Prof. Bates M. Bathan served as training facilitator.

After all the lectures, the training participants accomplished a laboratory exercises using their own data sets.

BAR Director Nicomedes Eleazar attended the activity and delivered a message during the program. He mentioned that BAR started the first leg of training on financial viability and profitability analysis in 2008 under the High Value Crops Development Program. This was followed in 2017, with three consecutive batches, including 52 participants from the Department of Agriculture's staff bureaus and attached agencies, state universities and colleges, local government units, among others. He also acknowledged SEARCA as one of the active partners of BAR in effectively providing capacity building facilities that translated in helping and guiding agri-preneurs on the viable and profitable investment strategy.

Through these series of training-workshop, BAR is able to provide a capability training enhancement program that packages and shares relevant result to the agricultural sector. This resulted in strengthening the National Technology Commercialization Program that focuses on upscaling and eventually outscaling technologies, and strategically positioning them to areas and communities where they are most needed. ### ***(Leoveliza C. Fontanil)***

Onion armyworm projects reviewed and monitored

PHOTOS: EJGESTUPA

INSET: Onion armyworm eating an untreated onion leaf.

Seven onion armyworm projects funded by Bureau of Agricultural Research (BAR) were reviewed and monitored on 21-22 February 2019 at the Central Luzon State University (CLSU) in Muñoz, Nueva Ecija.

The projects are under the program, "Comprehensive Research and Development on Integrated Pest Management for Onion Armyworm, *Spodoptera exigua* Hubner (Lepidoptera: Noctuidae)" which aims to address the perennial concerns on armyworm infestations.

Prior to the review, a short opening program was held. Dr. Annie Alberto, director of CLSU's Institute for Climate Change and Environmental Management and Dr. Fe Porciuncula, vice president for Research, Extension and Training, gave their welcome remarks and opening messages. On the part of BAR, Salvacion Ritual, head of the Program Monitoring and Evaluation Division, delivered the opening message, while Gerard Aranas, representing DA Undersecretary for High Value Crops Development Program Evelyn Laviña, also gave a short message focusing on BAR and HVCDP partnership. Program Development Division Head Joell Lales also attended the review as one of the evaluators.

Implemented in 2017, the program calls for the understanding and the nature of the pest and how government institutions and other instrumentalities can address the menace through massive campaign on how devastating onion armyworm is, how to prevent and eradicate it.

The projects under the program include: 1) Early Detection and Warning: Surveillance and Monitoring of Different Crops/Areas Affected

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BAR's info officers undergo seminar-workshop on photography

In an effort to further capacitate its information officers, the Bureau of Agricultural Research (BAR), through its Applied Communication Division (ACD), led a one-day seminar-workshop on photography, its basic concepts and principle involving hands-on activities on capturing meaningful images and appropriate techniques on 12 February 2019.

Juan Carlos Santiago, director and chief editor of PTV 4's Mag-Agri Tayo, served as the resource speaker for the seminar-workshop. He started the seminar by pointing out the foundational concepts of getting a good image. "A good image starts with the eye," he said. He also discussed the technical side to photography that involved setting the camera with the correct exposure, white balance, composition, and putting a story to an image. "There will be moments when you need to capture a moment quickly and getting the best shot depends on how well you know your gear," Santiago added.

The participants were able to apply their learnings during the workshop as they were tasked to come up with their own creative shots photographed using a DSLR in manual mode. Before the workshop, Santiago also discussed photo composition where he cited examples of taking photographs in different angles. While most of his discussions were on the basic rules to follow in photography, he reminded the participants that rules in photography can be broken, depending on the story one wants to convey.

Julia Lapitan, BAR-ACD head (3rd from right), and Juan Carlos Santiago, director and chief editor of PTV 4's Mag-Agri Tayo (4th from right) together with the participants of the seminar-workshop on photography. PHOTO COURTESY OF EJGESTUPA

It was Santiago's objective for the workshop to train participants not only to use the camera as a tool in creating the best possible image but more importantly, to invest in one own's creativity to produce an image that tells a story. ###

(Ephraim J. John Gestupa)

Training on Nipa Palm processing aims rural enterprise

Fritz Gerald Escudero of FREEDOM, Inc. discusses the process from preparing to packaging the Nipa syrup and sugar. This was followed by a hands-on training on Nipa Palm syrup and sugar processing.

PHOTOS: MEAQUINO

With the aim of training the existing and potential Micro, Small, and Medium Enterprises (MSMEs) on Nipa syrup and sugar processing, utilizing the abundant raw materials in the municipality, and providing them additional income, the Foundation for Rural Enterprise and Ecology Development of Mindanao (FREEDOM), Inc. conducted "Skills Training on Nipa Sugar/Syrup Processing" on 20 February 2019 in Vinzons, Camarines Norte.

The training was made possible through a project supported by the Bureau of Agricultural Research (BAR) under the National Technology Commercialization Program titled "Strengthening Nipa Sugar Processing and Enterprises in Selected Coastal Communities".

The on-going project aimed to establish Nipa-based products enterprises providing employment, generating income, and contributing to the local economy," said Antonio Peralta, executive director of FREEDOM, Inc. The next trainings are scheduled in Quezon, Sorogon, Bohol, and Occidental Mindoro.

The Department of Trade and Industry-Camarines Norte Provincial Office through the Negosyo Center requested a resource speaker/trainer to discuss and demonstrate the procedures on how to make Nipa syrup and sugar.

Initiated in 2014, FREEDOM, Inc. proposed a project to BAR seeking to improve the Nipa Palm sugar product in Lanuza, Surigao Del Sur; contribute to mangrove rehabilitation and protection; and strengthen the people's organizations in the community. In 2017, the upscaling of Nipa palm sugar processing took off in the provinces of Surigao del Sur, Agusan del Norte, and Oriental Mindoro.

Commonly used in the Philippines as roofing material for *bahay kubo* or made into vinegar (*sukang paombong*) or wine (*laksoy*), Nipa palm (*Nypa fruticans*) is now being processed as natural sweetener. It has lower glycemic index, and looks almost like coco sap sugar in appearance (granulated from the sap).

Currently, Nipa Palm sugar is being marketed in selected outlets in Davao City and in other urban areas in Mindanao. ### ***(Ma. Eloisa H. Aquino)***

2nd Face-to-Face Session...from page 6

expect you to be at forefront of efforts to promote a learning culture and implement an effective KM strategy in your institutions that is responsive to the capacity building and information needs of agricultural professionals and clienteles in the Philippines."

The three-day session was facilitated by the IKM mentorship program mentors, UPLB-CDC Professors Elaine D. Llarena, Pamela Joyce M. Eleazar, Edmund M. Centeno, and Rikki Lee B. Mendiola. Lessons on writing and videography for the dissemination of agri-fishery technologies and research results were covered.

The participants also visited development organizations with successful KM programs, such as the National Fisheries Research and Development Institute (NFRDI) and the Asian Development Bank (ADB) to experience firsthand knowledge on various existing KM practices.

The IKM mentorship program is being implemented in its second phase, funded by BAR through its Scientific Publication Grant (SPG), and is intended to capacitate the research information officers of the DA tasked to disseminate R&D results in agriculture and fisheries. ### ***(Daryl Lou A. Battad)***

Underutilized fruits turn into value products

The Philippines is blessed with abundant and diverse species of fruits, but many of them remain underutilized in terms of food processing.

According to the Philippine Statistics Authority (PSA), 170 of 300 fruits bearing perennial plant species are considered indigenous and most are either underutilized or neglected. They are commonly found in localities, but very few of them are available.

Recognizing the importance and potential of underutilized fruits, the Bureau of Agricultural Research (BAR), featured two topics in its seminar series emphasizing the nutrition, processing value, product development, and economic approaches of novel products from the underutilized fruit crops. The seminar, led by the bureau's Applied Communication Division, was held on 28 February 2019 at BAR Annex Building, Visayas Avenue in Quezon City.

Dr. Dennis Marvin O. Santiago, project leader and associate professor of the Institute of Food Science and Technology, University of the Philippine Los Baños (UPLB), served as the resource speaker on the topic, "Utilization of Neglected Underutilized Tropical Fruits for the Development of High Value Food Products." The project aimed to develop high-value products from selected and underutilized indigenous fruits in the country.

According to Dr. Santiago, tropical fruit crops also known as 'minor, 'orphan' or promising crops, are wild and domesticated plant species that have been overlooked by agricultural researchers and policymakers. "In fact, out of 30,000 edible plants only 30 are used to feed the world providing 95 percent of our food energy requirement. We saw the need to develop a research study intended to optimize their potentials," he said.

Dr. Santiago emphasized the needs in processing this neglected underutilized tropical fruits because it has inherent characteristics that can turn fruit into human health product by processing them. Nutrient-wise, it has 70-95 percent water; high percentage of phytochemicals such as phenolic compounds, organic acids, carotenoids, lutein, zeaxanthin, Vitamin A, B complex, C, E with macro and micro minerals; and carbohydrates that are present in digestible and indigestible forms.

Through the project, the group of Dr. Santiago was able to optimize the processing parameters of these underutilized fruits for wine and cordial production including passion fruit, *sapinit*, *rambutan*, *longan*, rattan, *lipote*, *aranga*, *duhat* and *kalumpit*. Among the product lines developed included juices, concentrates, fruit in syrups, jams, and jellies. They have established a quality assurance system in the processing the indigenous fruits into products.

"Utilizing them into commonly consumed food products will address the nutritional and human health problems and in effect, improve the economic status of farmers owing to the added-value of their produce," Santiago concluded.

Another topic discussed during the seminar series was the "Product Improvement and Marketing for Dalanghita Nectar," presented by Dr. Victoria Noble, project leader from the Southern Luzon State University (SLSU) Tagkawayan Campus. Her discussion centered on providing basis information in the existing market situation of dalanghita in Southern Luzon. Product procedures on making *dalanghita* nectar were also discussed. ### ***(Leoveliza C. Fontanil)***

Dr. Dennis O. Santiago of UPLB serves as one of the resource speaker during the BAR in-house seminar on 28 February 2019.

Dr. Victoria A. Noble of SLSU-Tagkawayan Campus serves as one of the resource speaker during the BAR in-house seminar on 28 February 2019.

Dalanghita nectar developed by the project team from SLSU

PHOTOS COURTESY OF JLAPITAN

INSET: One of the eggplant varieties grown inside the greenhouse

Glass houses for different crops with solar panel installation in Arava Valley, Negev, Israel.

Green energy powers agri-systems

by Ephraim John J. Gestupa

At the heart of every initiative of the Department of Agriculture is the farmer. Apart from the department's goal of achieving food security, DA safeguards the livelihood of the men and women who contribute to the country's supply of food. For farmers and fisherfolk, access to technologies is a major consideration for the sustainability of their practice.

As an archipelago made up of more than 7,000 islands, the economic experiences of farmers and fisherfolk sit at polar opposites. Access to specific farming inputs, from clean water to a steady supply of electricity, varies greatly depending on location. With climate becoming more unpredictable, so does the economic status of farming communities.

DA acknowledges the actuality of smallscale farmers and fisherfolk making up most of the sector's stakeholders. While at first glance it may seem to be a serious problem, it could also be a window to an opportunity.

In other parts of the world, under-developed communities such as those in East and West Africa are empowered by the local government and private entities through the introduction of off-grid agricultural technologies powered by renewable energy.

In order to see firsthand how this works, the Bureau of Agricultural Research (BAR), through funding support from the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) sent two of its top officials, OIC-Assistant Director Digna Sandoval and Applied Communication Division Head Julia Lapitan, to the "Eilat Eilot International Renewable Energy Conference" in Dan Eilat, Israel. This bi-annual event is hosted by the company that bears the same name and it highlights the best and the ground-breaking initiatives on renewable energy.

Despite only having 20 percent of its total land area is to be considered naturally arable, Israel maintains its status as a country that produces and exports its own agricultural commodities. This is made possible through technological innovations in the field of agriculture and renewable energy.

In the conference, policymakers from the international community met with investors, entrepreneurs, scientists, and industry leaders. This year, the conference put a spotlight on off-grid and smart-grid technologies powered by renewable energy.

Green energy is generated by harnessing energy from natural resources such as sunlight, wind, and flowing water. They are otherwise known as renewable energy since it can be readily available and sourced out from nature whenever it is available, unlike fossil fuels whose availability diminishes as it is further used and exploited.

Fossil fuels are harnessed through heavy machinery done by big corporations while renewable energy can be harnessed both in a commercial scale and small scale. Green energy is available even in rural and remote areas.

During their visit in Israel, Lapitan and Sandoval attended a series of panel discussions that showcased the best in agricultural technologies and farming systems which are considered as off-grid. One example is Irrigation by Condensation which is a technology developed by ROOTS Sustainable Agricultural Technologies. The system is made up of interconnected pipes, through it flow cold water which condenses the humidity in the air surrounding the pipe, thereby creating a continuous supply of water for irrigation. The cooling machine that refrigerates the flowing water inside the pipes is solar powered.

Also made possible by green energy are fresh water irrigation systems for communities who only have access to saltwater. Among the off-grid technologies showcased is Tethys Solar Desalination, a water treatment solution that directly uses the heat harnessed from the sun's rays in processing salty or contaminated water into clean water. The desalinating machine is scalable; it doesn't use electricity, and is built using recycled raw materials.

Aside from powering certain farming machinery with green energy, the conference also highlighted technologies that enable individuals to generate their own source of green energy. HomeBioGas is a start-up company whose backyard appliance converts organic waste into methane gas and organic fertilizer, all without the need for electricity Instead, HomeBioGas utilizes solar energy and bacteria that breakdown organic waste into gas. BAR

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Effective monitoring strategies against rice planthopper

by Patrick Raymund A. Lesaca

Rice planthoppers (RPH), including the brown planthopper (BPH), small brown planthopper, and white-backed planthopper (WBPH), are constraints to rice production because of their direct damages. They can transmit viruses that can be devastating to rice plants.

A study made by the Philippine Rice Research Institute (PhilRice) showed that continuous crop monoculture of high-yielding varieties with high fertilizer rate, unnecessary usage of pesticides, and the changing cultural practices, could possibly implicate the development of BPH population leading to breakdown of major genetic resistant varieties.

In keeping an environmentally-sound and a partnership-based research on rice research, Genaro Rillon of PhilRice and co-researchers have worked on project, "Construction of Epidemiology Information Interchange System for Migratory Disease and Insect Pests in Asia Region: Assessment of Rice Planthoppers Populations and Viruses in the Philippines." The project was funded by the Asian Food and Agriculture Cooperation Initiative (AFACI), which is being coordinated by the Bureau of Agricultural Research. It was established to monitor RPH and other viruses causing significant rice production losses in Asian countries. The goal is to reduce the vulnerability of rice crops losses caused by RPH outbreaks in the Philippines and to participate in the establishment of collaborative network.

Results can be accessed through the internet platform of the AFACI-Asian Migratory Insects and Viruses Surveillance (AMIVS), web-based portal system, designed as a depository for valuable information and a monitoring system.

Project assessment and monitoring results

The monitoring of RPH populations, using light traps, was conducted at the PhilRice Central Experiment Station (CES) in Munoz, Nueva Ecija. And in two sites using stick traps in PhilRice CES and in Mabini, Sto. Domingo, Nueva Ecija.

The light trap was set up weekly and used to approximate numbers of planthoppers (BPH and WBPH) density, while the sticky traps started at 10 days after transplanting until maturity of rice crop. In each sampling per week, sticky trapping was conducted at 10 hills randomly selected per field. At each trapping spot, the sticky trap was placed between two plants. The traps were brought to the laboratory for counting and recording the number of collected BPH and WBPH including spiders.

According to Rillon, observed high populations of RPH monitored using sticky trap coincided with the reproductive to ripening phases of rice plants in the field. Planthoppers prefer these phases of rice growth as they can get better nutrition around these stages. It was further observed that planthopper adults invaded rice at reproductive phase and seems that they invade rice earlier during wet season.

Rice planthopper

PHOTO: INTERNATIONAL RICE RESEARCH INSTITUTE

For both dry and wet seasons, monitoring showed that WBPH was usually recorded earlier to colonize rice plants than BPH. During field samplings, spiders, coccinellids, mirids, and tiger beetles were commonly observed in the field.

The population patterns observed would indicate that RPH develops in the field and peaked towards the end or as the crop neared maturity during the dry or wet seasons. Comparing these two population peaks recorded, higher peak of population occurred in wet season as compared with dry season. However, Rillon pointed out there was an increasing trend in the number of planthopper populations recorded and its associated hopperburn damage in some areas in the Nueva Ecija.

Initial planthopper population was usually observed during the reproductive stages and continuously increases as the crop matures. Population peaks were recorded from March to April, and from August to September. Similar patterns of populations of RPH were recorded during the dry (June - June) and wet (July - December) seasons. Consistently more BPH were recorded than WBPH. Only few patches of hopperburn injury were observed in farmers' fields during the year. Incidence of injury ranged from 5 to 20 percent. Incidence of rice virus disease was not recorded.

In the latter rice growth stages, populations decreased because planthoppers usually emigrate when rice is maturing due to poor food conditions of host plants. It was commonly observed that planthopper adults attacked rice at reproductive phase and seems that they invade rice earlier during wet season. For both dry and wet seasons, monitoring showed that WBPH was usually recorded earlier to colonize rice plants than BPH.

The project proponent was also able to input the data obtained from the monitoring conducted in the AMIVS system.

Recommendations and other researchable areas

Although the damage was not in serious outbreak proportions, there is also a need to continuously monitor RPH populations to prevent pest outbreak in the future.

To prevent RPH outbreak in the field, different management strategies were presented such as planting of varieties that are resistant to planthoppers, synchronous planting to avoid overlapping populations, conservation of beneficial organism to maximize natural biological control and proper use of chemical control when needed.

It is also necessary to study the changes in the practices of farmers like insecticide spray, nutrient application, variety usage and intensity of planting

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Building climate-resilient communities

Text and photos by Rena S. Hermoso

Mainit na talaga…kapag nahuli ka ng tanim wala na talaga… This is the common sentiment shared by the farmer cooperators in San Francisco and Guinyangan, Quezon. They shared that rain hasn't poured in their area since the start of the year. Experts from the Department of Agriculture-Regional Field Office (DA-RFO) CALABARZON and agricultural technicians from the Office of the Municipal Agriculturists (OMA) cautioned them that this dry spell is not yet the start of the dry season. It would get drier and hotter. They were advised to anticipate and prepare for the possible problems it would entail.

Earlier this year, the Department of Science and Technology-Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA) advised the public to take precautionary measures to mitigate the potential adverse impact of El Niño. This natural phenomenon threatens the livelihood of the agriculture and fisheries (AF) sector. To make matters worse, extreme weather changes, severe droughts and floods, more frequent and stronger typhoons, increase in annual mean temperature, among other events brought about by climate change also pose a serious threat to the AF sector as it threatens the sector's stability and productivity.

In 2013, DA launched the Adaptation and Mitigation Initiative in Agriculture (AMIA) Program to enable the AF sector to adapt to the adverse effects of climate change and build climate-resilient communities and livelihood. The initial phases of the program identified climate hazards and assessed climate-risk vulnerabilities of the communities. DA tapped various state universities and colleges to conduct a Climate Resiliency and Vulnerability Assessment (CRVA) in the first 10 provinces: Ilocos Sur, Isabela, Tarlac, Quezon, Camarines Sur, Iloilo, Negros Occidental, Bukidnon, North Cotabato and Davao del Sur. CRVA is measured through three components: 1) exposure of the municipality to climate-related hazards, 2) sensitivity of the crops to climate-risks, and 3) capacity of the farmers to adapt with the changing climate conditions.

Dubbed as the "Food Basket of CALABARZON," Quezon is primarily an agricultural province with more than 300 thousand hectares of agricultural land. According to the Southern Luzon State University (SLSU) through its CRVA in Quezon, "most of the municipalities have low to moderate exposure index to hazard; but considering that crops are highly sensitive to changes in temperature and extreme rainfall, then a minor change in weather and climate could have major implications on production."

SLSU identified San Francisco as the most vulnerable municipality followed by Guinyangan. San Francisco has low exposure to hazard index but several crops are sensitive to climate change and they have low adaptive capacity index. SLSU said that the best strategy to address their adaptive capacity is to increase the human and social capital in the municipality alongside introducing climate-resilient interventions and practices.

CRA project in Quezon

DA-RFOs of the 10 pilot sites used the results of the CRVA as the baseline data for the next phase of the program. DA-Southern Tagalog Integrated Agricultural Research Center (STIARC), through funding support from the Bureau of Agricultural Research (BAR), implemented the "Community-based Action Research for Climate-resilient Agriculture (CRA) in CALABARZON Region." The project aims to help the farmers adapt to climate risks and build climate-resilient livelihood through participatory action research.

During a monitoring activity of BAR on 27 February- 2 March 2019, farmer cooperators were able to share their observation with the changing climate and their experiences going through the project and adopting the interventions introduced to them.

In order to strengthen and improve the human and social capital of the farmers, the project team organized 10 Farmers' Learning Groups (FLG) in San Francisco and five FLGs in Guinyangan. "Farmer cooperators conducted field trials of CRA interventions according to their commodity concern and shared these technologies and outcome with other farmers," shared Project Leader Aida Luistro.

Further, rice farmers in San Francisco tried testing stress-tolerant varieties. They attested that that RC 282 and GSR 11 are the varieties that gave promising yield and results. These varieties are drought-tolerant with longer maturing days, 110 and 115, respectively. To provide additional income for the farmers, the project team introduced the planting of legumes (i.e. mungbean, peanut, and soybean) as it is effective in improving soil health. Other CRA interventions introduced in San Francisco are corn-based cropping system (with legumes or purple yam, sloping agricultural land technology (SALT), breeding of native pig production.

In Guinyangan, vegetable farming was introduced to coconut farmers.

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Indigenous Plants:

Source of natural food color

Text and photos by Rita T. dela Cruz

Color plays an important role in our food preference. It can predetermine how we perceive the taste and flavor of what we're about to eat. In fresh foods, we rely on the color to determine their level of ripeness or freshness. For processed food, it becomes a whole different topic. When food undergoes processing, it loses its natural vibrant color, thus the need for artificial color additives or food coloring.

Artificial coloring makes any food product more delectable and mouth-watering. Unfortunately, some of them are actually harmful to the body. Although some claims are still to be validated and are subjected to debates, they can be toxic and carcinogenic.

To address this, researchers from the University of the Philippines Los Baños (UPLB) led by Lourdes B. Cardenas of the Institute of Biological Sciences, conducted a study with the hope of providing the public a healthy and safe alternative to artificial food coloring using indigenous plants. The study, "Biotechnology in the Utilization of Natural Colors from Indigenous Plants," which was funded by the Bureau of Agricultural Research, aimed to identify indigenous plants with health benefitting natural colors and develop technologies using them.

The study screened over 20 indigenous plant species among them included: *alugbati*, *lipote*, *duhat*, 4 o' clock, *gumamela*, roselle, butterfly pea, *pandan*, turmeric, barberry, *kamantigi*, begonia, mayana leaf, bougainvilla, *talinum*, oxalis, impatients, portulaca, nasturtium, and bell pepper.

These indigenous plants were screened using the following criteria: 1) toxicity, 2) tinctorial strength (potency of the pigment) but with minimal or without imparting any flavor or aroma, 3) availability of the raw materials and ease of handling, 4) mutagenicity (capacity to induce mutations), and 5) stability of the pigment under different pH, temperature, and light regimen. Also considered in choosing the plant pigment as food colorant are solubility in water, and demand of a particular color in the market.

As potential food colorants, the researchers included plant species with *Anthocyanins* and *Betalains*, these are plant pigments that are water soluble. Carotenoids were not included in the study as these pigments are not water soluble and are sensitive to light.

Meanwhile, the researchers included Curcuminoids (not water soluble), which can be found in turmeric, because it was found to be the best alternative natural colorant to Tartrazine (synthetic lemon yellow azo dye primarily used as a food coloring).

To get the results, the colorants were tested under different types of food preparation: fresh, steamed, boiled, and baked. They prepared salad using the begonia, and ice cones or scramble with a whole extract from *lipote*, turmeric, and butterfly pea directly poured on top of the shaved ice. A fondant was made using the *lipote*, 4 o'clock, and butterfly pea color extracts; and gelatins, *puto*, *suman*, butter cookies, scones, and chocolates using the color extracts from *alugbati*, *lipote*, turmeric, butterfly pea, and 4 o'clock. The extracted natural pigments were also put inside micro capsules for stability.

Results of the study showed that among the plant species tested, the best sources of red colorant are: *alugbati* (*Basella rubra* L.), *lipote* (*Syzygium curranii*), and red 4 o'clock (*Mirabilis jalapa* L.). Meanwhile, the best source for yellow pigment is turmeric (*Curcuma domestica* (L.); for blue pigment it is butterfly pea (*Clitorea ternatea* var. *pleniflora*); and for green pigment it is pandan (*Pandanus amaryllifolius* Roxb).

Duhat (*Syzygium cumini*), red *gumamela* (*Hibiscus rosa-sinensis* L.), and roselle (*Hibiscus sabdariffa* L.) were dropped from the list due to factors involving toxicity, stability of pigment, availability of raw materials, and difficulty in extraction of pigment, among others.

The researchers noted that not all pigments from the plant species can be processed into colorants due to low

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Series of training on EL...from page 7

stakeholders.

"Thus, increasing promotion and exposure of EL technology in the local, as well as in the international scene, has economic value for agri-tourism. It also offers potential commercial profitability and livelihood opportunity. These help to empower the farming communities as well as its private partners that are striving to produce enough and affordable food for all Filipinos," said Jovita Ganongan, officer-in-charge chief tourism operations officer, DoT-CAR.

The training covers EL concepts, principles, element, and processes; implementation and maintenance; and hands-on activities, among others.

UPLB EL Team is composed of Maria Charito Balladares, Asst. Prof. Norma Medina, Bryan Apacionado, Jennica Amielle Mora — they served as resource speakers/facilitators during the series of training. ### ***(Gladys B. Gammad)***

Onion armyworm...from page 8

by Onion Armyworm; 2) Detection, Spatial Tracking, Damage, and Yield Assessment and Mapping of Armyworm Infestation and Diseases of Onion Using Remote Sensing Technology; 3) Biological Studies of Onion Armyworm; 4) Efficacy Test of Biopesticides and Microbials against Onion Armyworm; 5) Insecticide Management and Resistance Studies for Onion Armyworm; 6) Quality and Safety Assessment and Postharvest Behavior of Onion Grown under Integrated Pest Management Program against Armyworm; and 7) Enhancing Cultural Management Practices in Reducing the Infestation and Damage of Onion Armyworm.

The monitoring team also visited and assessed the five onion project sites in the municipalities of San Antonio, Sto. Domingo, Dolores, Muñoz, Nueva Ecija. Aside from the actual monitoring, BAR staff also had the opportunity to engage with the farmers involved in the project by inquiring from them on how the projects are being implemented.

The program review and monitoring are essential tool to validate the effectiveness of the program in support to the eradication, if not, reduction of onion armyworm infestations particularly in the provinces of Nueva Ecija and Pangasinan.

The onion armyworm program is in collaboration with the DA-HVCDP. The project proponents are the National Crop Protection Center (NCPC) and Postharvest Training and Research Center of the University of the Philippines Los Baños (UPLB); and CLSU. ### ***(Ephraim John J. Gestupa and Patrick Raymund A. Lesaca)***

Green energy powers...from page 11

is in a strategic position to explore the technologies showcased during the Eilat-Eilot conference. After an insightful visit to Israel, Sandoval and Lapitan reported the need for BAR to look into the development and promotion of green energy among its research projects.

Given that renewable energy is a science that has widespread, multi-sectoral impact and relevance, one of the necessary steps BAR is taking as it explores green energy is through complementation initiatives with other government agencies. In 2018, BAR initiated meeting with representatives from the Department of Science and Technology and the DA-Agricultural Training Institute in order to strengthen inter-agency complementation. This is to ensure a seamless flow of information from R&D generated results to the development of new projects. ###

Indigenous Plants...from page 14

tinctorial strength, and fragility, among others. But even so, these can still be used as colorants for freshly-picked ingredients to dishes that include the begonia, talinum, oxalis, impatiens, portulaca, and nasturtium.

As a final product, the project was able to develop natural colorants in the form of freeze dried whole extracts, microcapsules, gelatin bars, and glycerine solutions.

With the health benefitting natural colors that these indigenous plants can provide, these natural colorants are better option than their synthetic counterparts. It not only improves the quality of our food, it also enables us to utilize these indigenous plants which are readily available and easily harvested from our gardens. ###

For more information, please contact:
Dr. Lourdes B. Cardenas
Project proponent and Professor
University of the Philippines Los Baños
(049) 536-2807/(049) 536-2893
lbcardenas@up.edu.ph

Building climate-...from page 11

The package of technology include fertilizer application based on soils analysis, use of organic fertilizer, and use of open pollinated variety seeds. They are also currently testing two black pepper varieties (native and Taiwan). Planting black pepper is in support to the Guinyangan Municipal Local Government to expand its production in other barangays.

"To promote CRA technologies and practices to other farmers, two Farmers' Field Day were conducted," shared Luistro. She also mentioned that farmer cooperators in San Francisco were able to visit the AMIA villages in Guinyangan. Through this educational visit, they were given the opportunity to learn from each other's knowledge and experiences with the CRA interventions and practices.

In addition, the project team capacitated the AF communities in agri-based enterprise development through seminars which include corn charcoal briquette making, soybean processing, and native pork processing. They also linked farmers to government financial service providers and conduit cooperative/bank and provided access to weather information and farming advisories.

Access to weather information and farming advisories were also provided to the farmers with the assistance from DOST-PAGASA. Weather forecast is disseminated through social media. They also installed farm-level weather instruments to monitor and record precipitation and temperature.

In San Francisco, Cristino Bayran rigorously observes and records weather information since the start of the project. Based on his observations, the diurnal range increased from 7 degrees Celsius to 14 degrees Celsius. He shared that the extreme changes in weather is very alarming. In late 2018, he shared that farmers couldn't plant because of the severe rainfall — a complete opposite of what they are experiencing this early in the year. Thus, the importance of enabling our AF communities to adapt to climate risks and build climate-resilient communities and livelihood. ###

For more information, please contact:
Aida P. Luistro
Senior Science Research Specialist
STIARC, DA-RFO-CALABARZON
(0929) 855 5858
aydzluistro@gmail.com

BAR undergoes ISO certification process

Quality Management Representative Alexander Arizabal Jr. encourages the team to fully cooperate for a succesful Quality Management System certification of BAR. PHOTO: DLBATTAD

In an effort to deliver consistent and quality support services for agriculture and fisheries sector, the Bureau of Agricultural Research (BAR) is taking the necessary steps to secure ISO 9001:2015 certification.

To gain better understanding of the implementation and auditing requirements of the new ISO 9001:2015 Standard, BAR held an "Appreciation Course Seminar" for its staff on 21 February 2019 at BAR Conference, Diliman, Quezon City.

Led by the Synergized Macro Solutions, Inc. (SMS) with its resource speaker Cirila Botor, the one-day course covered five modules which consist of the following: 1) Development and Revision of ISO 9001 Standard; 2) Key Quality Concept and Terms; 3) Understanding the Requirements of ISO 9001:2015 Standard; 4) Overview of Implementation and Certification Processes; and, 5) Benefits of ISO 9001 Implementation and Certification.

The participants were comprised of the bureau's Technical Working Group for BAR ISO 9001:2015 Quality Management Certification. Serving as the agency's Quality Management Representative is Alexander Arizabal, Jr.

During her opening remarks, BAR OIC-Assistant Director Digna Sandoval said, "ISO is not just about the processes that we do inside the agency, but it also speaks about the quality of work and service we render. As the lead coordinating arm of the Department of Agriculture for national agriculture and fisheries research, it is crucial for us to develop a professional and more standardized culture in our work and in our internals – as from this will manifest how well we create our outputs for the benefit of our stakeholders."

The appreciation course seminar was followed by a seminar workshop on "Quality Management Systems Documentation" on 27-28 February 2019. The activity aimed to identify and map out the critical processes involved in delivering the bureau's outputs, and form necessary models of which one can monitor the performance of a division in accomplishing their own outputs.

Led by ISO Consultants Jo Ann Chavez and Cris Garcia, the members of the ISO certification TWG were advised through the process of Quality Management System (QMS) Documentation. For the most part of the activity, BAR staff undertook a workshop where they had to map out all the processes involved in their own respective divisions, including the input and the output requirements and to identify performance standards to which each component is measured.

As the Department of Agriculture's staff bureau in charge of coordinating and funding all research and development projects for the agriculture and fisheries sector, BAR is determined to ensure the excellent quality of the service it gives. ### ***(Ephraim J. John Gestupa)***

Effective monitoring...from page 12

that favors the development of planthopper populations in the field.

PhilRice plans to continue monitoring RPH to establish population patterns of the insect pests. This is also to sustain the strong regional collaboration that is essential for the generation of information to improve management of RPH in the country.

AFACI is an international cooperation body committed to improving food production, promoting the adoption of sustainable agriculture practices, and enhancing the extension services of Asian countries. The Philippines is one of the member-nations of AFACI since it was inaugurated in 2009. ###

For more information, please contact:
Genaro S. Rillon
Crop Protection Division,
Central Experiment Station, PhilRice
Science City of Muñoz, Nueva Ecija
gsrillon@yahoo.com

BARChronicle
BUREAU OF AGRICULTURAL RESEARCH
RDMIC Bldg., Visayas Ave., cor. Elliptical Rd.
Diliman, Quezon City 1104
PHILIPPINES

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