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PHOTO COURTESY OF ATI-ISD

BAR, ATI complement RDE efforts

Striving to close the gap between research and extension and to lay the ground works on how to systematically manage them, the Agricultural Training Institute (ATI) and the Bureau of Agricultural Research (BAR) led a complementation workshop on Research and Development and Extension (RDE) on 25-27 June 2018 in Baguio City.

Distinct in terms of functions and thrusts, R&D and Extension are two separate domains that both address specific needs of the agriculture and fisheries sector in attaining sustained growth. BAR and ATI, as the research and training arms of the Department of Agriculture (DA), respectively, both have inherent complementary functions in the RDE continuum.

The Department, through various initiatives and policy-related issues and directions, has strived to close the gap between RDE. There were successful indicators but the process flow on how research results are to be effectively channeled into various extension modalities and strategies to reach the grassroot level, were never institutionalized.

The aim of the workshop was for BAR and ATI to look into complementation efforts and strengthen further the RDE network. Specifically, the two-day activity was designed to: 1) identify gaps and opportunities in relation to RDE continuum of the agriculture and fisheries sector; 2) strengthen the delivery of vital agricultural and fisheries information to farmers, fisherfolk and other stakeholders; 3) describe the correlation between BAR and ATI; 4) come up with a Knowledge Management (KM) framework that will support the RDE continuum by integrating the KM models of BAR and ATI; and 5) develop a KM-based project proposal in response to the needs and problems in the RDE continuum and identify a third party institution/organization that will undertake the management of the project.

BAR Director Nicomedes P. Eleazar led the activity wherein in his message he reiterated the need to strengthen the complementation efforts of the two agencies of DA in ensuring a "seamless flow of information along the RDE continuum."

Joining the workshop were panel of experts on KM and extension composed of Dr. Virginia Cardenas and Dr. Filma Calalo from the University of the Philippines Los Baños and Mr. Jose Rey Alo, adviser of the Department of Trade and Industry-Philippine Trade Training Center.

ATI-Information Services Division (ISD) Chief Antonieta Arceo

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DA, DOST conduct research complementation workshop

During the workshop, participants are divided into three groups (i.e. crops, fisheries and livestock) to discuss the complementation arrangement for each program.
PHOTO COURTESY OF DA-BIOTECH PROGRAM OFFICE

In an effort to harmonize initiatives on research and development (R&D) programs in agriculture and fishery biotechnology, a two-day complementation workshop was organized by the Department of Agriculture (DA) and the Department of Science and Technology (DOST) on 4-5 June 2018 in Los Baños, Laguna.

Attending for DA are representatives from the Bureau of Agricultural Research (BAR) and the Biotechnology Program Office (BPO), while representatives from the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) attended for DOST.

The aim of the complementation was to efficiently utilize the available infrastructure, human, and financial resources among the agencies and the implementing partners to accomplish the research and development agenda set in support to the development of the agriculture and fisheries sector.

With the complementation in agriculture and fisheries biotechnology research and development, data sharing among the agencies was facilitated to ensure harmonization. Among the identified priority commodities for complementation were abaca, papaya, tomato, tilapia, swine, and water buffalo.

Mr. Joell Lales, chief of BAR-Program Development Division; and Dr. Vivencio Mamaril, director of BPO, led the DA team; while the team from DOST-PCAARRD was led by Dr. Reynaldo Ebora, executive director; and Dr. Edwin Villar, deputy director.

Representatives from DA-Biotechnology Centers specifically the Livestock Biotechnology Center-Philippine Carabao Center and Fisheries Biotechnology Center-National Fisheries Research and Development Institute also participated in the workshop. ### ***(Ian Jomari C. Panaga)***

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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.

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22 BAR undergraduate scholars recognized

To contribute to the country's manpower requirements in agriculture and related fields by supporting BS students, the Bureau of Agricultural Research (BAR) has been implementing an Undergraduate Scholarship Program, through the Institutional Development Division (IDD). The program is in partnership with the University of the Philippines Los Baños (UPLB) through the Office of the Vice Chancellor for Academic Affairs (OVCAA) and UPLB Foundation Inc. (UPLBFI).

Launched in 2012, the program was initially for BS Agriculture and BS Agricultural Biotechnology students. In 2015, the scholarship was made available to students taking other agriculture-related courses, namely, BS Food Technology and BS Development Communication.

To date, six batches comprising of 73 scholars are being supported through the scholarship program.

For academic year 2017-2018, 22 scholars graduated during the 46th UPLB Commencement Exercises held on 23 June 2018, five of them earned Latin Honors (*Cum Laude*): Roy R. Boten (BS Agriculture), Ericka Joy U. Ancayan (BS Agricultural Biotechnology), Lawrence Gabriel C. Ignacio (BS Food Technology), Patricia Mae A. Lara (BS Food Technology), and Clarissa Mae N. Abao (BS Development Communication).

L-R: Dr. Fernando C. Sanchez, Jr., UPLB chancellor, Dr. Nicomedes P. Eleazar, BAR director, Dr. Portia G. Lapitan, vice chancellor for academic affairs, and Dr. Enrico P. Supangco, UPLB-College of Agriculture and Food Science dean award one of the five BAR scholars who graduated with Latin Honors. PHOTO: NCORONADO

Prior to the graduation ceremony, the UPLB-Office of the Student Affairs (OSA) held the "*Isang Parangal… Isang Pasasalamat… Ika-4 Taon*" to recognize graduating scholars and donor partners on 14 June 2018. Representing BAR Director Nicomedes P. Eleazar was Assistant Director and concurrent IDD Head Digna L. Sandoval. Also present were Vice Chancellor for Academic Affairs Dr. Portia G. Lapitan, UPLBFI Executive Director Dr. Casiano S. Abrigo Jr., and UPLB Office of the Student Affairs Director Atty. Eleno O. Peralta. The UPLB-OSA awarded Certificates of Appreciation for the donor partners, including BAR, in supporting UPLB students to earn and complete their BS degrees.

In another event, BAR Director Eleazar graced the scholars' college graduation and testimonials on 21 June 2018 wherein he recognized the achievements of the scholars. He also expressed the bureau's pride in their hardwork – proving that the scholars have put to good use the opportunity given them. Director Eleazar personally congratulated and awarded the five scholars who graduated with honors (*Cum Laude*) with the DA-BAR Academic Excellence Medal and P10,000.00 cash. ### ***(Nadine B. Coronado)***

BAR, ATI strive...from page 1

presented their KM Framework and Thematic Program, while BAR-Applied Communication Division (ACD) Assistant Head Rita dela Cruz discussed the bureau's Framework as well as its specific programs and initiatives in managing its KM.

To provide the overview of BAR's banner programs, the Community-based Participatory Action Research (CPAR) and the National Technology Commercialization Program (NTCP), Ms. Salvacion Ritual, head of BAR-Program Monitoring and Evaluation Division presented the CPAR program while Ms. Elena Garces, assistant head of the BAR-Technology Commercialization Division presented the NTCP.

The workshop identified current and existing RDE programs of BAR and ATI; discussed possible and future areas for collaboration; and identified relevant issues and courses of actions. Participants were also able to enumerate the dimensions or parameters of the complementation in addressing constraining and facilitating factors, and further recommend interventions and mechanisms.

Among the major outputs of the workshop were the drafting of a Simplified RDE Continuum Structure for Agriculture and Fisheries and Models for RDE Complementation integrating the KM models of BAR and ATI.

A prescribed timeline was also developed and will serve as the operating principles enabling the continuum of RDE.

Part of the way forward, the group came up with various agreements to help in institutionalizing the process flow of RDE continuum. A Technical Working Group (TWG) will be created composed of selected officials from both agencies that will further validate the initial results of the workshop, prepare enabling protocols, and more importantly, seek the Secretary's concurrence for the issuance of a Department/ Special Order that will institutionalize the process. ### ***(Patrick Raymund A. Lesaca)***

BAR conducts 2018 AFACI project review

The Bureau of Agricultural Research (BAR) conducted this year's project review cum meeting of the on-going projects funded by the Korea-based Asian Food and Agriculture Cooperation Initiative (AFACI) on 14 June 2018 in Quezon City.

Leading the activity was Dr. Nicomedes P. Eleazar, BAR director and recently appointed national representative of the Philippines to AFACI. He was joined in by principal investigators (PIs) of completed AFACI-funded projects, namely, Dr. Marilyn B. Brown, deputy director of the National Institute of Molecular Biology and Biotechnology (BIOTECH), University of the Philippines Los Baños (UPLB); Dr. Mannix S. Pedro, university researcher, BIOTECH, UPLB; and, Dr. Romualdo C. Martinez, chief science research specialist, Philippine Center for Postharvest Development and Mechanization.

Highlights of the accomplishments of the four out of five on-going projects funded by AFACI were presented during the activity. Among the projects presented include: 1) "AFACI-GAP Project: Development of Locally-Appropriate GAP Programs and Agricultural Produce Safety Information System in the Philippines" by Ms. Mary Grace Mandigma, PI of GAP and officer-in-charge division chief from Bureau of Agriculture and Fisheries Standards; 2) "Assessment of Brown Planthopper, Whitebacked Planthopper Populations and Virus Diseases in Rice and Selected Solaneceous Crops" by Mr. Genaro S. Rillon, PI of IPM and research division head of crop protection from Philippine Rice Research Institute; 3) "Collection, Characterization and Distribution of Vigna sp. and Pigeon pea Germplasm to Promote Use in the Philippines (Phase 2)" by Ms. Maria Lea H. Villavicencio, PI of PGR and university researcher from Institute of Plant Breeding, College of Agriculture and Food Science (CAFS), UPLB; and, 4) "Application of improved Postharvest Handling Techniques of Crops grown by Farmers in the Philippines (Phase II)" by Ms. Jennelyn M. Resorez, in behalf of Dr. Perlita A. Nuevo, PI of Postharvest and research assistant professor from Postharvest Horticulture Training and Research Center, CAFS, UPLB.

AFACI is an intergovernmental and multilateral cooperation body aiming to improve food production, realize sustainable agriculture and enhance extension service of Asian countries by sharing knowledge and information on agricultural technology. Since its inception in 2010, BAR serves as the lead coordinating agency of the AFACI-funded projects in the Philippines.

The bureau, through the Applied Communication Division, has been facilitating the conduct of annual AFACI evaluation meetings and related activities in the country. ### ***(Rena S. Hermoso)***

Dr. Nicomedes P. Eleazar, BAR director and recently appointed national representative of the Philippines to AFACI in a photo opportunity with AFACI principal investigators, research implementer and BAR staff. PHOTO: RHERMOSO

Dr. Nicomedes P. Eleazar, BAR director, (center) leads the review of AFACI projects implemented in the country. PHOTO: RHERMOSO

Farmers participate in community planning for climate change

During the workshop, farmer-cooperators are tasked to determine different issues met concerning Lake Bato fishery. They also suggest solutions they deem necessary to address such challenges. PHOTO: DLBATTAD

To increase awareness on climate change and its effects, and capacitate fishing communities, the University of the Philippines Los Baños Foundation, Inc. (UPLBFI) and the UPLB College of Public Affairs and Development, in partnership with the Bureau of Agricultural Research (BAR) conducted a "Participatory Community Resiliency Action Planning for Climate Change" in Bato Lake, Camarines Sur on 5-6 June 2018.

The training-workshop was part of the project titled "Developing Strategies towards More Resilient Fishing Communities amidst Climate Change: The Case of Major Lakes in Luzon" which is being implemented from January 2017 to December 2018. The project is composed of three studies that include: 1) characterization and profiling of fishing communities; 2) community-based adaptation strategies on the effects of climate change among fishing communities in Luzon; and 3) capacitating fishing communities on climate change adaptation strategies towards improved resiliency.

The two-day workshop aimed to come up with an action plan at the barangay and municipal levels that will enable the community to cope and mitigate the negative effects of climate change.

Lake Bato in the province of Camarines Sur is one of the project's

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2nd AgriTalk seminar goes to Cabanatuan

The Luzon leg of the AgriTalk seminar held in Cabanatuan, Nueva Ecija was attended by more than 500 participants. PHOTO: LFONTANIL

Cabantuan, Nueva Ecija served as the venue for the Luzon leg of the AgriTalk Free Seminars held on 9 June 2018 at SM City Cabanatuan Events Center.

Agritalk was organized by the Manila Bulletin, in partnership with the Department of Agriculture's Agricultural Training Institute (ATI), Bureau of Agricultural Research (BAR), and Regional Field Office (RFO) 3.

Participated by more than 500 individuals, the activity provided a venue for individuals and groups of agriculture practitioners on the latest trends and technologies in agricultural development. Specifically, the activity aimed to showcase the latest agricultural technologies to improve technology adoption, demonstrate how these work through demonstration, emphasize its benefits and significance as these include good agricultural practices, and highlights the return of investment of each technology.

Participants were welcomed by Atty. Jennilyn Dawayan, DA-RFO 3 regional technical director for research and regulations; Mr. Ian Belleza, branch manager of Manila Bulletin's Agriculture Magazine; and Ms. Veronica Concepcion Esguerra, center director of ATI-Regional Training Center 3.

Among the topics discussed during the seminar were: 1) Making Organic Concoctions by Mr. Juniper Dizon of DA-RFO 3; 2) Square Foot Gardening by Mr. Honorio Cervantes of ATI; 3) Mushroom Production by Dr. Emily Soriano of DA-RFO 3; 4) Sustainable Vegetable Production and Farm Tourism by Ms. Desiree Duran of Duran Farm Agribusiness and Training Center Association. Inc.; 5) Goat

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Coconut highlights BAR seminar

INSET: Dr. Jocelyn Zarate (left) of the University of the Philippines Los Baños and Mr. Benjamin Villaflor (right) of the Local Government of Quezon serve as the resource speakers during the BAR monthly seminar held on 21 June 2018.

The Bureau of Agricultural Research (BAR) conducted its monthly seminar on coconut on 21 June 2018 at BAR Annex, Visayas Avenue, Quezon City.

Specific topics were on: 1) "Efficacy of Mykovam on Coconut Seedlings and Introduction of Mykoplus for Crop Production" by Dr. Jocelyn Zarate of the University of Philippines Los Baños - National Institute of Molecular Biology and Biotechnology (UPLB-BIOTECH); and 2) "Production and Commercialization of Coconut Sap Sugar" by Mr. Benjamin Villaflor of the Local Government Unit – Quezon.

According to Dr. Zarate, Mykovam is a soil-based biological fertilizer containing microbial inoculant of spores, infected roots and propagules of beneficial vesicular-arbuscular mycorrhizal fungi providing nutrients to the crops. It can replace 60-85 percent of the chemical fertilizer requirement of plants and is proven as an efficient bio-fertilizer input for enhanced growth and yield of coconut trees. She added that its application showed promising results in terms of highest phosphorus content for the development of mature leaves, as well as nitrogen and potassium, eliminating the need to apply some more fertilizers and/or other amendments.

"The microbial communities degrade the organic matter (OM) from the soil, nourish themselves and then multiply. These active microbial activities called composting produces great impact on soil fertility to promote germination, stimulate rooting, flowering and fruit set, which are significant on crop production, and that's how Mykovam works," Dr. Zarate explained.

Based on the results on different treatments conducted by UPLB-BIOTECH, the appearance of coconut trees applied with Mykovam has the tallest height and looked more vigorous compared to other trees with treatments. Application of Mykovam also prevents root infection by pathogens and increases plant tolerance to drought and heavy metals. Mykovam is cheap and easy to use since a kilo of it can fertilize 200 coconut plants. Application is done only once throughout the entire life of a plant.

"Mykovam is considered a supplement non-chemical inputs attributing in bringing back soil health and biodiversity that support to our sustainable agriculture," Dr. Zarate concluded.

Meanwhile, during the second presentation, Mr. Villaflor demonstrated the cooking product processing of coconut sap sugar and coconut vodka. The cost and return analysis for each product was also presented.

Spearheaded by BAR's Applied Communication Division, the seminar is a regular activity of the bureau featuring topics from the results of funded research projects. The seminar is one of the outlets wherein significant technologies generated from research are being disseminated to the general public.

Also during the activity, info materials including crop calendars and other technology brochures were distributed to the seminar participants. The production was made possible through a collaborative effort between BAR and the Asian Food and Agriculture Cooperation Initiative (AFACI). ###

(Leoveliza C. Fontanil)

CGUARD-TWG reviews implementing guidelines for registration of traditional corn varieties

Members of the Technical Working Group (TWG) of the Corn Germplasm Utilization through Advanced Research and Development (CGUARD) met on 5 June 2018 to review and finalize the implementing guidelines on collection, characterization, conduct of yield trial, registration and production and distribution of traditional corn varieties. The meeting was a follow-up to the February 2 meeting wherein initial plans and targets for the registration of traditional corn varieties seed production and distribution were discussed.

With the laid out set of guidelines, the meeting was called to specifically identify the components of registration of traditional corn varieties, steps and plans of actions from the collection and characterization leading to the registration of traditional corn varieties. Also discussed were the institutions responsible, expected outputs, and timelines.

The finalization of the guidelines has been required so that a Memorandum Order, to be signed by Department of Agriculture (DA) Secretary Emmanuel Piñol, will be released. This will enable the DA-Regional Field Offices (RFOs) to mass produce and distribute the registered seeds.

The TWG also agreed to settle with the term "traditional" instead of "native" corn varieties to be consistent with the terminology that the Bureau of Plant Industry (BPI) and the National Seed Industry Council (NSIC) are using.

Funded by the Bureau of Agricultural Research (BAR), the CGUARD program was initiated in 2015 to collect, conserve, and develop native corn germplasm for agronomic response to different environment and physiological stresses including pests and diseases, soil acidity and salinity, soil fertility, drought, and water logging. The thrust of CGUARD is focused on the utilization aspect which means breeding which will be used in developing the varieties that the farmers can use. The program is being implemented by the DA-RFOs in collaboration with the Institute of Plant Breeding-University of the Philippines Los Baños (IPB-UPLB) and BPI.

The DA-National Corn Program provides the general direction and budget appropriation to BAR while the RFOs support the activities related to promotion of traditional corn varieties. Likewise, BAR is assisting in the coordination of research activities both at the national and regional levels.

In attendance during the meeting were: Dr. Candido Damo of the DA-National Corn Program; Dr. Vivencio Mamaril of the Bureau of Agriculture and Fisheries Standards; Dr. Artemio Salazar of the IPB-UPLB and CGUARD coordinator; Ms. Elvira Morales of the BPI-National Seed Quality Control Services Division; and BAR Corn Program Focals, Ms. Rhea Desalea of the BAR-Program Development Division and Apolonia Mendoza of the BAR-Program Monitoring and Evaluation Division. ### ***(Rita T. dela Cruz)***

(L-R) TWG-CGUARD Members: Dr. Artemio Salazar of the Institute of Plant Breeding-University of the Philippines Los Baños, Dr. Vivencio Mamaril of the Bureau of Agriculture and Fisheries Standards, and Dr. Candido Damo of the DA-National Corn Program discussing the guidelines for registration of traditional corn varieties. PHOTOS: RDELACRUZ

RRDEN special meeting finalizes operations manual

Held on 29 June 2018, the Regional Research, Development and Extension Network special meeting was participated by regional technical directors and research managers from regional offices of DA and BFAR. PHOTO: DLBATTAD

A special meeting was called for by the Bureau of Agricultural Research (BAR) through its Program Monitoring and Evaluation Division (PMED) to consult BAR's regional research and development (R&D) partners on the finalization of the Regional Research, Development, and Extension Network's (RRDEN) operations manual.

Attended by 57 participants composed of regional technical directors and research managers from the regional offices of the Department of Agriculture (DA) and Bureau of Fisheries and Aquatic Resources (BFAR), and BAR technical staff, the meeting was held on 29 June 2018 at BAR Conference Hall, Visayas Avenue, Diliman, Quezon City.

RRDEN was created for each region pursuant to the Agriculture and Fisheries Modernization Act (AFMA) mandating DA Regional Integrated Agricultural Research Centers (RIARCs) to develop and maintain a network of regional and provincial collaborators in undertaking the regional RDE programs. BAR is tasked to oversee and coordinate the activities of the network to ensure the efficient delivery of the RD&E system, and at the same time strengthen the cooperation among network members.

The operations manual encompasses the network's purpose, objectives, membership rules, functions of all stakeholders, and strategies of implementation including funding support that will ensure a standard, consistent, and systematic approach in carrying out the network's defined goals.

BAR Assistant Director and concurrent Chief of the Institutional Development Division (IDD) Digna Sandoval graced the meeting. She discussed proposal preparation and funding guidelines of the RRDEN facilities under BAR's Institutional Development Grant (IDG) program.

Ms. Rita dela Cruz, assistant head of the bureau's Applied Communication Division (ACD), presented the official logo of the network, which carries the design made by the Mindanao group. With modifications and improvements with the initial design, the final and official RRDEN logo – embodying the network's identity and purpose – was decided on during the meeting.

PMED Chief Salvacion Ritual served as the chair of the meeting. The manual is set to be launched during the National Technology Forum (NTF) at the Megatrade Hall, SM Megamall in August. ### ***(Daryl Lou A. Battad)***

Farmers participate in...from page 5

study sites. It is the seventh largest lake in the Philippines. According to Department of Environment and Natural Resources Region 5, it has an average surface area of 38 square kilometers and a depth of 1.8 meters. Tilapia and carp are the most common fishes propagated in the lake.

Fishing, being the main source of livelihood within the municipality, has been on a decline because of various factors such as illegal fishing, pollution, unregulated fishing, and fish kill, and sedimentation of the water resource, among others.

Based on the results of the activities conducted by the project team led by Dr. Miriam Nguyen, the fishing community has limited knowledge on climate change and its adverse effects both to people and the environment. With the provision of awareness-raising activities and action planning-workshops, the fishers of Lake Bato are able

6 organic agriculture R&D projects reviewed

The Bureau of Agricultural Research (BAR), through its Program Monitoring and Evaluation Division (PMED), conducted a progress review of six on-going projects on organic agriculture on 26 June 2018 at BAR.

A review and assessment on the agronomic and economic performance, soil changes of organic rice and vegetable production systems (squash, string beans, pole sitao, tomato and eggplant) under varying climatic and soil conditions in various locations of the Philippines were evaluated by Dr. Blesilda Calub of the University of the Philippines Los Baños and Ms. Kris Thea Marie Hernandez of BAR-PMED.

Specifically, the objective of the review was to compare the 'best bet' organic production systems with the local farmers' versus the current organic and conventional practices for rice and vegetable production.

Part of the activity was to present the updates and accomplishments of organic agriculture R&D projects; and to discuss and address project implementation and management concerns.

PHOTO: LFONTANIL

The six organic agriculture R&D projects were evaluated by Dr. Blesilda Calub of the University of the Philippines Los Baños and Ms. Kris Thea Marie Hernandez of Bureau of Agricultural Research-Program Monitoring and Evaluation Division.

Presenting the accomplishments of the R&D projects were Mr. Genesis Castro of Department of Agriculture-Regional Field Office (DA-RFO) 4B; Ms. Virginia Agreda of DA-RFO 6; Ms. Aiza Mae Gordones of DA-RFO 12; Mr. Pedro Oliver of DA-RFO 5; Ms. Estella Cuestas of DA-RFO 11; and Mr. Abdul Nasseef Ulong of Deparment of Agriculture and Fisheries-ARMM.

After the review, the evaluators gave suggestions to be incorporated during the project implementation and for the project refinement/s to be submitted to BAR for consolidation.

Dr. Calub, one of the evaluators, prompted the project implementers to submit raw files of the data gathered for proper validation and documentation of RDE activities, which according to her, will be a key in creating reliable database information on the current practices and status of organic agriculture in the country.

Meanwhile, Ms. Hernandez reminded them to submit concise yet substantial technical reports for all analysis and methods applied that were used during the implementation of organic agriculture projects. ### ***(Leoveliza C. Fontanil)***

AgriTalk seminar goes...from page 5

Production Technologies by Mr. Robinel Ocampo of DA-RFO 3; and 6) Livestock (Large Ruminant) Production and Enterprise in Farm Tourism by Mr. Celestino Managuit of Jocel Farm.

Part of the activity was the distribution of information, education and communication (IEC) materials including the crop calendars and kits on crop production to the participants. The distribution of IEC is an initiative of BAR, through its Applied Communication Division, in collaboration with the Korea-based organization, Asian Food and Agriculture Cooperative Initiative (AFACI).

Agritalk Cabanatuan is the second of the seminar series for 2018. The first seminar was conducted in Iloilo City in May for Visayas, while the third seminar will be held in Davao for the Mindanao leg. ### ***(Leoveliza C. Fontanil)***

to identify the needs and provide solutions to address such needs.

During the workshop, participants pointed out the pressing issues they deemed were hindrances to a productive catch. Having identified so, solutions were raised such as the implementation of fishing regulations and ordinances; community-led clean drive; and improved technologies on fish caging and lake seeding, as well as provision of markets and postharvest facilities.

Also, since Region 5 is typhoon-prone, participants found it crucial to have insurance of fish cages and an early-warning system that could prepare them and their production sites against these calamities. This way, the damage can be minimized.

With the presence of the members of the local government units, the outcome of the activity will serve as baseline for policy consideration and formulation. ### ***(Daryl Lou A. Battad)***

BAR supports R&D initiatives on jackfruit

INSET: Product innovations from jackfruit developed through R&D initiatives

"Jackfruit is considered by the Department of Agriculture (DA) as one of the high-value crops and is one of the priority commodities of Eastern Visayas to be commercialized. And for that to happen, we should increase its production and improve its productivity. This is when we implemented the Community-based Participatory Action Research (CPAR) on Jackfruit Production and Processing in Barangays San Isidro and Malinao in Mahaplag, Leyte," said Ms. Alicia Bulawan, co-leader of the CPAR project.

Funded by the Bureau of Agricultural Research (BAR), the CPAR project implemented from 2010 to 2013 aimed to pilot a village-level production and processing scheme for jackfruit to support the commercialization of jackfruit in the region.

Based on the results of the participatory rural appraisal among the members of Mahaplag Jackfruit Growers Association, project cooperators, the following problems on jackfruit production were identified: lack of capital, lack of technical knowledge on cultural management and processing of jackfruit, occurrence of pests and diseases and high cost of production inputs.

Hence, the DA-Regional Field Office 8, through the Eastern Visayas Integrated Agricultural Research Center (EVIARC), in collaboration with the Visayas State University (VSU), developed technologies on jackfruit. These were taught to the farmers through the conduct of trainings and workshops.

"We provided them with appropriate technologies on integrated nutrient management, pest management, and pruning strategies," Bulawan said. Aside from production management, the CPAR project also provided trainings for home-based processing of jackfruit products. "We have also introduced processing jackfruit into pastillas, tart, jam, and jelly to women from the same association. Most of them are the farmers' wives," she added.

After two years of implementation, jackfruit yield increased from 8 metric tons to 15 metric tons per hectare; production areas were expanded to 11 hectares; number of farmer-cooperators increased from 22 to 52; and average income was boosted from Php 96,250 to Php 317,500. Establishment of plant nurseries as scheme to expand plantation was made possible through the project.

CPAR, one of the banner programs of BAR, is a location-specific research cum extension modality that deals with improved technologies for the farming and fishing communities. Through the years, CPAR has helped in improving the lives of our farmer cooperators and adoptors.

Other BAR-funded R&D initiatives on jackfruit

BAR has since then continually supports research and development (R&D) initiatives on jackfruit. One of these projects is the collaboration project of BAR and VSU that aimed to produce chitin and chitosan from chitin-containing crustacean exoskeleton wastes, and to evaluate their potential together with raw materials for the control of *Phytophthora palmivora*—a disease that is affecting the production of jackfruit in the country. Through this project, researchers were able to identify the most effective chitin and chitosan source as well as the most effective method of treatment application.

Aside from *Phytophthora palmivora*, the high seasonality of jackfruit also affects its production. "Studies on the flowering behavior of EVIARC Sweet jackfruit, which was developed by DA-EVIARC, revealed that flowers were mostly produced in the months of November and December and in February and March," said Dr. Dario Lina, assistant professor at VSU. To address this problem, Dr. Lina is currently implementing a project aimed to increase the productivity and raise competitiveness of the jackfruit industry in Eastern Visayas through science-based manipulation of year-round production of fruits to support fresh market and processing industries.

Another on-going project on jackfruit by the University of the Philippines Los Baños is the "DNA Barcoding, Georeferencing, Morphological Characterization, Preliminary Evaluation and Selection of Philippine Jackfruit (*Artocarpus heterophyllus* Lam) Germplasm and its Relevance." Started earlier this year, the project is aimed to improve the characterization, conservation and utilization of jackfruit and its

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Production of Nipa Palm sugar expanded

Taking off from the initial success of an earlier project in Lanuza, Surigao del Sur of the Foundation for Rural Enterprise and Ecology Development of Mindanao (FREEDOM), Inc. the production on Nipa Palm sugar has now expanded to cover Butuan City, Agusan del Norte.

The upscaling of the project was confirmed during a project site visit of a monitoring team from the Bureau of Agricultural Research (BAR) on 10-13 June 2018 in Butuan City.

Funded by BAR, through its National Technology Commercialization Program, the project aimed to provide a viable source of sustainable livelihood to selected coastal communities in Lanuza, Surigao del Sur and nearby municipalities.

"However, developments and interest in the product has generated more interest, which required adjustments to address the current need for expansion," explained Mr. Antonio S. Peralta, executive director of FREEDOM, Inc.

With the assistance of FREEDOM, Inc., the Municipality of Lanuza in Surigao del Sur was able to obtain a Php 33 million grant from the Peoples Survival Fund established by the national government. From this funding, Php 7 million was allotted to support the Nipa Palm sugar project in Lanuza. Therefore, FREEDOM, Inc. with the approval from BAR expanded the project to Calapan City, Oriental Mindoro and Butuan City, Agusan del Norte to cater the need for expansion in other areas that are significantly closer to urban markets.

"FREEDOM, Inc. has established a smallscale processing facility in Butuan City in partnership with Barangay Babag because it is the source of Nipa sap in Butuan City," said Mr. Peralta.

A Nipa Palm sap facility was established in Brgy. Babag and it was made possible through a Memorandum of Agreement between FREEDOM, Inc. and the Barangay Council of Babag. A Nipa Palm processing facility that can accommodate bigger volume of Nipa sugar production was also constructed.

A mechanical dryer with a built in thermometer was also acquired. This helped reduce the moisture content from 10 to 2 percent and has resulted to a better taste. Aside from better taste, the Nipa Palm sugar produced is also of lighter color and has better texture compared to coco sugar. The processing facility is the first of its kind in the country that can produce Nipa Palm sugar in commercial quantities.

Mr. Peralta shared the marketing activities for Nipa Palm sugar. He mentioned that they are currently waiting for the arrival of the product certification from the Food and Drug Administration, a prerequisite of their prospective buyers in Korea, Japan, Germany, Italy, Spain, Middle East, and United States. They are also working to comply with the product certification requirements from Biodiversity Management Bureau and Mindanao Halal Authority.

Nipa Palm sugar, a natural sweetener with low glycemic index, is produced from the sap of nipa palm (*Nypa fruticans*), commonly used in the Philippines as roofing materials for *bahay kubo* or processed as vinegar (*sukang paombong*) or wine (*laksoy*).

Currently, the Nipa Palm sugar is being marketed in selected outlets in Davao City and other urban areas in Mindanao at a smallerscale. It is available in 250g stand up pouch for Php 145. According to Mr. Peralta, "Nipa Palm sugar is seen as a lower cost product as compared to coco sugar [thus] this will provide a lower cost alternative to consumers and to those who want to maintain a healthy lifestyle." ### ***(Rena S. Hermoso)***

INSET: Packaging of the improved Nipa Palm sugar produced in Butuan City

BAR monitoring team visits the newly established Nipa Palm processing facility in Butuan City.

PHOTOS: RHERMOSO

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related endemic species through the creation of quick, cost-effective and reliable identification, monitoring and characterization scheme using DNA barcodes, georeferenced maps and characterization profiles.

"In a status report of jackfruit improvement in the Asia-Pacific Region by Sidhu, the importance of molecular markers was cited as one of the future prospects and strategy for jackfruit production and utilization, indicating its usefulness in popularizing this species as a commercial crop, for identification and for breeding purposes," said Ms. Teresita Borromeo, project leader. ### ***(Rena S. Hermoso)***

Mainstreaming soybean products from research

Text and photos by Daryl Lou A. Battad

The owners of D'Soya, Mr. Donald Esguerra and his wife, Mrs. Chona Esguerra, are farmer-cooperators during the implementation of the collaborative project between PhilMech and BAR on soybean production and processing technologies.

The ultimate goal of agri-fishery research and development (R&D) sector is to develop, promote, and commercialize its technologies. To mainstream value-added products generated from R&D is no longer a far-fetched idea, as with the case of soybean.

Carrying the brand name D'Soya, these soybean products including soymilk, taho, and Okara cookies, as well as rice meals such as tofu steak, tofu teriyaki, and sizzling tofu, have now reached the mainstream market, particularly in a popular mall in Angeles City, Pampanga.

The project that started it all

The project, "Pilot Testing of Integrated Soybean Production-Processing Technologies towards Accelerating the Development of the Local Soybean Industry in the Philippines" is a collaborative project implemented by the Philippine Center for Postharvest Development and Mechanization (PhilMech) and funded by the Bureau of Agricultural Research (BAR).

It targets to assess the technical and financial viability of an integrated production, postharvest and processing systems of soybean. Also, the project aims to encourage and capacitate farmers to engage in soybean processing for added value and income while creating a demand for locally produced soybeans.

With soybean production currently gaining momentum evidenced by a substantial increase in production areas across the country, the project team, led by Ms. Ma. Cecilia Antolin of PhilMech, deemed it best to provide support to soybean farmers through the adaptation and application of commercially available mechanical planter, weeder, and harvester for soybean. These postharvest implements, according to Antolin, were specifically mentioned as among the urgent needs to improve the quality of soybean, and to attract more farmers and growers to plant soybean.

D'Soya: Plant-based protein, meatless option

Mr. Donald Esguerra, a farmer-entrepreneur and owner of D'Soya, happens to be one of the cooperators in the implementation of the two-year project of PhilMech.

"It was sometime in November of 2016 when I joined a seminar conducted by PhilMech," Esguerra said. "It was the start of my ventures in the soybean industry," he added.

Back then, Esguerra received 40 kilos of soybean seeds as inputs from PhilMech. He used the CLSoy variety, a variety developed by Central Luzon State University (CLSU). He admitted that he was hesitant at first as he wasn't fully sure of the technology yet. With an initial production area of half a hectare, he was able to harvest 180 kilos of soybean.

"I was doing a trial and error in producing these products from soybean, until a project team from PhilMech reached out and helped me to improve my practices," shared

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Esguerra. The intervention allowed him to produce soymilk, his first ever product.

In August 2017, Esguerra received a call from Antolin to follow up on his soybean production. "Ma'am Cecille learned that I was already doing well with production and value-adding, *at maganda naman ang* feedback *niya*, so *sinabi lang niya sa akin na ituloy ko lang ang ginagawa ko.* I was then provided 4 bags of seeds and expanded my production area from 0.5 to 2 hectares," he said. This time though, he was able to get a significant increase in production, having been able to harvest 2.2 tons using PhilMech intervention.

"*So doon na nagsimula lahat. Yung team nina* Ma'am Cecille and Sir Jay Neric are in constant communication with me. From time to time, *nagco*-consult *ako sa kanila* on production and postproduction to make sure *na tama ang ginagawa ko, hindi na* trial and error *lang*," Esguerra mentioned.

From then on, Esguerra started selling soymilk drinks within his community. He would also have costumers at a local church he attends to. "*Nagustuhan naman nila ang* products *namin. Hindi rin kami nahirapang ibenta* because I am a vegetarian, and that is my advocacy. As you can see, *yung* tag line *ng* D'Soya is "Plant-based protein, your meatless option." I personally practice that in real life," he said.

With the right motive and sound conviction, Esguerra took the chance to submit an application at a shopping mall where he can sell his products and reach the mainstream market. It was in May 1 of this year when Marquee Mall in Angeles City, Pampanga gave him a spot. "When I applied for a kiosk in Marquee, I was surprised when they called back and told me that they have been waiting for products like these. We were so happy because as farmers, *yun ang gusto natin, makarating sa mga ganitong klaseng* market *ang* produce *natin, hindi ba*? Esguerra said.

Currently, Esguerra and his wife, Chona produce a variety of products made from soybean. Soymilk has different variants like chocolate, ube, and the original flavor. These are available at 250 ml, 350 ml, and 500 ml sold at Php 15, Php 25, and Php 35 respectively. They also have 300 ml chilled *taho* in different flavors such as *arnibal*, strawberry, mango, and blueberry sold at Php 30, Php 50, Php 35, and Php 40 respectively. Okara cookies, a specialty, is made out of soybean pulp, and are sold at Php 6 per piece.

According to Esguerra, he is very satisfied with the way his business goes. "We already earn a respectable income from our products, but we are still planning to expand our business," he shared. Another branch is set to open at Nepo Mall in Angeles City, sometime in September.

He was also able to deliver his products at Pampanga State Agricultural University (PSAU) in Magalang, Pampanga. Soon, he will also put up outlet stores in Victoria, Mindoro where he hails from.

To Esguerra, farming is really a profitable enterprise. "We just need the right technologies and the right people to support us. *Pasalamat kami talaga sa* PhilMech *at sa* DA-BAR because they are the right people, and they provided the right technologies," he concluded. ###

Soymilk original flavor (left) is a bestseller while chilled soy taho (right) is also a crowd favorite.

These Okara cookies are made from the pulp of soybean.

Reducing postharvest losses in *Wombok*

Text and photos by Ephraim John J. Gestupa

Before cabbages are displayed on the isles of our local supermarkets, all wrapped up in a thin sheet of plastic, chilled, and tagged with a seemingly expensive price per piece, cabbages had to undergo a number of postharvest handling steps for it to get from farm to final display.

This entire process of handling harvested cabbage puts a lot of stress to the commodity, ultimately affecting its size. Most consumers who only get their produce at the supermarket are generally unaware that a piece of purchased cabbage could have bought them an entire sack of the same produce at a farm level, what makes the produce more expensive are the costs that cover the commodity's journey to the dining table.

Wombok, *pechay* or Chinese cabbage, is a leafy vegetable commonly used in cooking Filipino dishes like pansit and bulalo. It's also the main ingredient of kimchi, a Korean staple that Filipinos have learned to love.

Despite being a common ingredient for a lot of Asian dishes, Chinese cabbage is a commodity that sheds a lot of its leaves when handled improperly. "*Nang dahil sa hindi tamang pag*-handle *ng ating* commodity *ang nangyayari ay nasisira ito, ito ay nagiging* 'loss' *na*. 'Loss' *sa magiging produkto at* 'loss' *doon sa* income *ng mga* farmers," explained Dr. Perlita A. Nuevo of the Postharvest Horticulture and Research Center (PHTRC), University of the Philippines Los Baños (UPLB)

According to Dr. Nuevo, *Wombok*'s leafiness accounts for the commodity's tendency to wither quickly. The more postharvest handling it undergoes, the more of *Wombok*'s leaves are shed. If one were to visit the trading post where truckloads of *Wombok* are delivered to the city, workers would package *Wombok* one by one, wrapping them in newspaper sheets and placing them on plastic sacks, all while standing on a green and white carpet of withered or bruised cabbage leaves that were peeled off. Dr. Nuevo has observed in her studies at the PHTRC that *Wombok* sheds off 38 percent of its size when it finally reaches final market.

In the Cordillera and Mountain Province regions, Dr. Nuevo, Ms. Matilde V. Maunahan, and her team of researchers from PHTRC-UPLB studied the postharvest practices of *Wombok* as part of their contribution to a postharvest manual that was published by the Asian Food and Agriculture Cooperation Initiative (AFACI), a Korea-base intergovernmental and multilateral cooperation body, where the Philippines is a member of, along with other 13 Asian countries.

It was observed in their studies that since the commodity is planted in the uplands, transporting the cabbage to Metro Manila where the temperature is much hotter than Baguio, causes the leaves to wither and turn yellowish therefore deeming the produce to fall short of market standards. Even before *Wombok* is brought to the lowlands, some traditional postharvest practices done by the farmers themselves such as placing their harvest in containers with hard or sharp edges were observed to bruise the crops' outer

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leaves which makes it more likely to be peeled off.

Seeing how farmers work very hard to sell their produce by the kilo, Dr. Nuevo and her colleagues set out to produce a simple postharvest guide that would minimize agricultural wastes caused by poor postharvest practices. They introduced these interventions to the local farmers by way of IEC materials that the Bureau of Agricultural Research (BAR) reproduced through funding assistance from AFACI. Since its inception in 2010, BAR serves as the lead coordinating agency of the AFACI-funded projects in the Philippines.

"*Pag maganda ang pag*-handle *ng ating Wombok*, *mas matagal ang* storage *ng ating* commodity, *mas matagal ang buhay niya, mas matagal ang panahon para maibenta iyan*," added Dr. Nuevo.

An example of the technology interventions introduced to local cabbage growers is the immediate wrapping newspaper sheets or plastic of *Wombok* after it was harvested in the field even before it is hauled on to the trucks. Another simple solution PHTRC came up with was the placement of *Wombok* in a crate: damage is less likely to happen if *Wombok* is placed upside-down, with its tip facing the bottom of the container.

These solutions may sound simple but if practiced, PHTRC calculated an eight percent decrease to postharvest wastes. "The main challenge of the farmer is the terrain, *nasa bulubundukin ang taniman ng* farmer so he or she has to level a small portion of the earth where cabbage can be planted on. *Maliit lang ang* production area *ng* farmer," shared Dr. Nuevo as she underscored the importance of improved postharvest technologies that can lead to increased profitability.

PHTRC's research on *Wombok* is part of AFACI's initiatives to strengthen the value chain of various vegetable commodities across Asia. By 2016, AFACI has successfully published three manuals highlighting improved postharvest practices for high-value crops namely tomatoes, cabbage, chili peppers, and banana. Since AFACI is an inter-governmental and multi-lateral cooperation, the manuals aimed to present the various practices done in specific Asian member-countries like Bangladesh, Bhutan, Cambodia, Indonesia, Kyrgyzstan, Lao PDR, Mongolia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam and Korea.

In the Philippines, PHTRC has shared copies of the manuals to provincial agricultural offices, agricultural universities, and farmer associations. PHTRC's partnership with BAR continues to do extension work for Dr. Nuevo's research outputs by packaging the information in simple and concise guides for Filipino cabbage farmers. ###

To request for free copies of the manuals, please contact:
Applied Communication Division
Bureau of Agricultural Research
Phone: (02) 461-2800
Email: acd@bar.gov.ph

For more information about the technology, please contact:
Dr. Perlita A. Nuevo
Postharvest Horticulture and Research Center
University of the Philippines Los Baños
Phone: +63 (049) 543-1012
Email: phtrclibrary.uplb@up.edu.ph

***"Nang dahil sa hindi tamang pag-*handle *ng ating* commodity *ang nangyayari ay nasisira ito, ito ay nagiging* 'loss' *na.* 'Loss' *sa magiging produkto at* 'loss' *doon sa* income *ng mga* farmers," explained Dr. Perlita A. Nuevo of PHTRC-UPLB

A cabbage farmer opens the Wombok postharvest guide produced through the AFACI-funded project conducted by Dr. Perlita A. Nuevo of PHTRC-UPLB.

HEA Piñol keynotes 1st Sem DA Info Meeting

In his keynote speech, HEA Piñol acknowledged the important role of information officers in empowering the people by disseminating breakthroughs and technologies in agriculture. PHOTO: RDELACRUZ

"Going back to basic and know what our farmers really need," thus the gist of the message of Head Executive Assistant (HEA) Ferdinand Piñol during the opening ceremony of the "First Semester Consultative Meeting cum Workshop for Regional Information Officers, Public Information Officers of the Department of Agriculture" held on 27 June 2018 in Baguio City.

HEA Piñol, keynote speaker, relayed Department of Agriculture (DA) Secretary Emmanuel Piñol's directives specifically on the production of basic commodities (farmers' produce) and credit facilities. He encouraged all the information officers to continue supporting the Secretary's advocacy particularly in disseminating relevant information to the public. He likewise acknowledged the important role of the information officers in empowering the people by disseminating breakthroughs and technologies in agriculture that will improve the lives of the farming and fishing communities.

Also, during the opening day, Artist Roberto Castro conducted a seminar-workshop titled, "The Art of Communication" explaining how to effectively communicate to an intended audience without the nuisances and stereotypes on how government agencies usually communicate. He conducted practical activities to exercise and hone the "creative sides" of the information officers.

Other highlights of the activity included DA program/project updates on the Halal Program and the *Pagkain Para sa Masa* program followed by a social marketing seminar-workshop in the afternoon. Updates on the Freedom of Information (FOI) directives were also presented by the Presidential Communications Operations Office.

The updates on FOI was done with the hope that as information officers of DA, they will be aware of the directives and will be guided accordingly especially in disclosing information involving public interest and upholding right to information particularly on matters of public concern. ### ***(Rita T. dela Cruz)***

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