RESEARCH FOR DEVELOPMENT

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Biosensor test kit as surveillance tool for ASF

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CONTENTS

ABOUT THE COVER

COVER PHOTO COURTESY OF CLSU

In 2019, the Philippines was severely affected by the spread of the African Swine Fever (ASF). Thus, DA intensified its efforts to contain and manage ASF.

As such, Central Luzon State University and DA-Bureau of Animal Industry, developed effective management strategies for the detection and monitoring of ASF using the ASF Nanogold Biosensor Test Kit.

DA-Bureau of Agricultural Research supported its development and mass production of the rapid test kits.

Agricultural Magazine of the Year
2007 Binhi Awards

Best News Magazine
2003 Gawad Oscar Florendo

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R4D NOTES

DA-BAR responds to the challenges of the agriculture and fisheries sector through research for development

DR. JUNEL B. SORIANO

This is a crucial moment for the world food systems. Hunger is on the rise since 2015 and three billion people worldwide cannot afford healthy diets, according to the International Food Policy Research Institute of the Consultative Group on International Agricultural Research (CGIAR).

At the same time, agriculture is facing hefty problems ranging from high cost of production inputs, pests and diseases, environmental degradation, and climate change, among other things. All of these concerns were already underway even before the COVID-19 pandemic. The Philippine agriculture for one is being confronted with these challenges and urged to do more.

Today, research and innovation in food, land, water, and environment systems are crucial for sustainable and climate-resilient agriculture and fisheries sector. Meanwhile, the experience from the pandemic sparked willingness to think beyond traditional perspectives — economic, technological and innovative.

The Herculean task of finding ways of providing food on the table for every Filipino along with issues on high cost of production inputs, low productivity, pests and diseases, climate change, and so forth, lies squarely upon the shoulders of the government, particularly of the department. For its part, DA-BAR recognizes the urgency to take action and contribute to the solution through R4D.

The Department of Agriculture-Bureau of Agricultural Research (DA-BAR) is focused on contributing to the DA's vision of a food-secure and resilient Philippines with empowered and prosperous farmers and fisherfolk. As the lead coordinating agency in the agriculture and fisheries research for development (R4D), the bureau vigorously pursue strategies and programs anchored on the OneDA pillars of modernization, consolidation, industrialization, and professionalization.

Guided by its inclusive and transformative R4DE framework, the bureau will ensure that supported programs, activities, and projects are geared towards greater resilience, inclusion, efficiency, and sustainability. In particular, its R4D direction will focus on how these technologies will be transferred, adopted, scaled and commercialized in order to optimize, if not fully maximize the gains for the benefit of the sector and its stakeholders.

This year's maiden issue of the DA-BAR R4D Digest centers on promoting technologies and initiatives that seek to contribute in abating problems face by the agriculture and fisheries sector.

Aside from the R4D initiatives on rice, corn, high value crops, poultry and livestock, other cross-cutting programs such as organic agriculture and climate change are included in this issue. Featured here are recent R4D initiatives which were results of DA-BAR funded projects. These projects were implemented by various R4D partner institutions with the goal of contributing to food security and sustainable agricultural development. ■

Biosensor test kit as surveillance tool for ASF

MA. ELOISA H. AQUINO

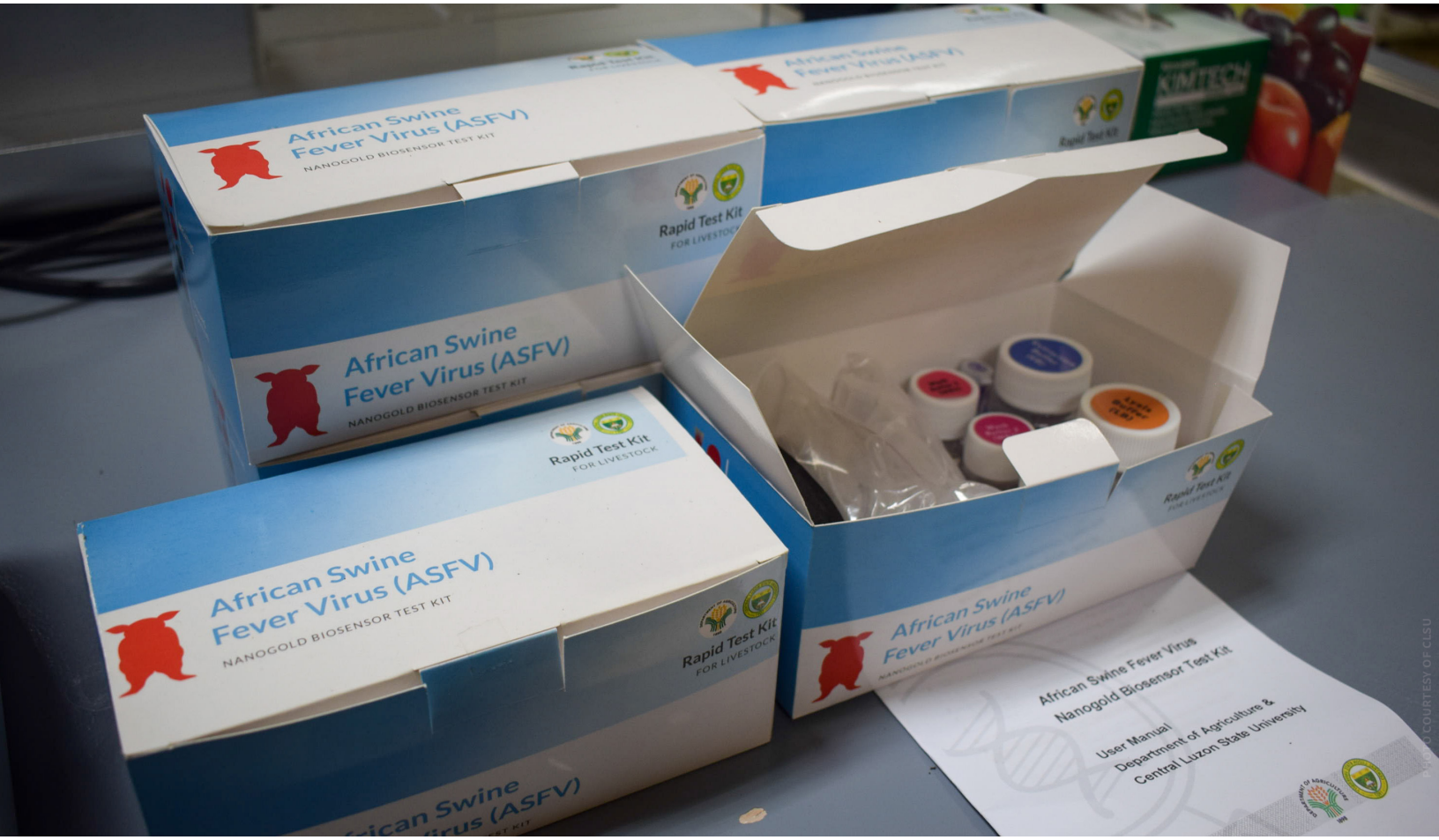

PHOTO COURTESY OF CLSU

Philippines recorded African Swine Fever (ASF) spread in 12 regions, 46 provinces, 493 cities and municipalities, and 2,561 villages nationwide since it hit the country in 2019. This prompted President Rodrigo Roa Duterte, through Proclamation No. 1143, to declare a state of calamity due to ASF until the end of the year upon the recommendation of the National Disaster Risk Reduction and Management Council.

The three million reduction in the country's swine population resulted in PhP 100B in losses among the local hog sector and allied industries leading to increased retail prices of pork products.

In line with one of the burning issues of the agriculture sector, Agriculture Secretary William Dar instructed the department to elevate and accelerate its efforts to contain, manage, and control ASF, and intensify hog repopulation program.

DA launched the Bantay ASF sa Barangay or BABAy ASF Program and Integrated National Swine Production Initiatives for Recovery and Expansion or INSPIRE, a twin program with a goal of instituting biosecurity and disease control measures in tandem with calibrated repopulation and enhancement of the local swine industry to recover the sector's capacity to locally produce adequate supply of hogs and pork by 2023.

With this, Central Luzon State University (CLSU), in partnership with the DA-Bureau of Animal Industry, developed effective management strategies for the detection and monitoring of ASF using the ASFV Nanogold Biosensor Test Kit. DA, through BAR, supported the development including mass production of rapid test kits.

"The ASFV Nanogold Biosensor test kit shall be used to further investigate a farm that has been previously hit by ASF with an indication of a potential serious risk that may contribute to a possible recurrence of ASF to sentinel animals once loaded to the farm," Dr. Clarissa Yvonne J. Domingo, project leader from CLSU, said.

A combination of loop-mediated isothermal amplification (LAMP) method and nanotechnology, the test kits can be used as rapid screening test for in the nationwide efforts on biosecurity and disease control measures in tandem with calibrated repopulation and enhancement of the local swine industry at a much cheaper and faster rate. Since the test uses a nucleic-acid based amplification protocol, the kit already comes with a DNA extraction set of reagents which circumvents the need of buying a separate commercial extraction kit. In order to use the test kits, two simple and affordable laboratory equipment such as a high-speed microcentrifuge and a dry bath with heat block are required.

"Detection and monitoring of the ASF viral genetic material on surface swabs of pens, water supply, oral and faecal swabs, including fresh and processed meat and whole blood using the ASFV Nanogold Biosensor Test Kit served as an effective management strategy towards repopulation of commercial and smallhold swine farms," she added.

The ASF test kit costs PhP 3,500 good for 10 samples. Further, each sample can be a pool of five surface swabs, or faecal swabs as long as these come from pigs of the same pen for traceability. On the other hand, a pool of three oral swabs or whole blood samples from three individual pigs can be tested in one reaction tube caveat the animals come from the same farm house or pen. Thus, the cost would be simply PhP 70 each using a pool of five surface swabs or fecal swabs and PhP 117 each using a pool of three oral swabs or whole blood samples. For water, sample must come from the main water source of the farm hence, testing must be done individually for each different farm hence, the cost would be PhP 350.

As of September 2021, there was a 24% reduction in the total hog inventory from 12.8M heads in January 2020 down to 9.7M in January 2021 due to ASF.

"After the implementation of the DA's twin program called BABay ASF and INSPIRE, there was an encouraging increase in the number of heads from 9.7M to 9.87M from January 2021 to October 2021. No ASF cases were reported from 91 to 180 days and until 181 to 800 days," Dr. Domingo shared.

Against Real-Time PCR, the ASFV Nanogold Biosensor test kit showed a 87.5% accuracy rate in samples in surface swab and water. For fresh and processed meat, a recorded 97.5% and 95% accuracy rate, respectively. Meanwhile, for whole blood samples, the test kit's accuracy was recorded as 92.5% when pitted against Real-Time PCR.

Commercial and small hold pig farmers, private and LGU veterinarians, suppliers of disinfectants, animal health researchers, microenterprise distributors of the test kits, microenterprise of diagnostic laboratories using the RTKs are the target beneficiaries of the technology.

Detection and monitoring of the ASF viral genetic material on surface swabs of pens, water supply, oral and faecal swabs, including fresh and processed meat and whole blood using the ASFV Nanogold Biosensor Test Kit served as an effective management strategy towards repopulation of commercial and smallhold swine farms.

"The ASFV Nanogold Biosensor was used after instructing the farmers to clean their pens with disinfectants and lime provided by the LGU. After the pens have dried, surface swabbing was done and tested using the test kit. Farmers whose pens registered negative in the swab test were prioritized to receive sentinel animals. Animals that survived more than 180 days were allowed to reach the finishing age (around 234 days)," Dr. Domingo ended. ■

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Determining level of mechanization for policymaking and development planning

DIWA J. VELASQUEZ

The level of agricultural mechanization is one of the bases in determining agricultural mechanization in the agriculture and fisheries sector. Studies showed that there has been no standardized procedure in determining these levels in the Philippines. Thus, DA in 2017 adopted a unified measurement of the level of mechanization in the Philippines through the Modified Agricultural Mechanization Index (MAMI) developed by Dr. Rossana Marie C. Amongo, et al. It helps in identifying the mechanization gaps in the rice and corn production-postproduction systems.

With this, the Agribiosystems Machinery and Power Engineering Division, Institute of Agricultural and Biosystems Engineering, and Center for Agri-Fisheries and Biosystems Mechanization, College of Engineering and Agro-industrial Technology-University of the Philippines Los Baños (CEAT-UPLB) through the funding support of DA-Bureau of Agricultural Research aimed to assess the level of agricultural mechanization of rice and corn production systems in CALABARZON using a unified methodology.

Moreover, its goal is to develop an assessment procedure in determining the level of mechanization with regards to the ideal level that will provide an efficient decision tool in policymaking and development planning for the agricultural mechanization sector.

"As one of the flagship programs of the government, the purposive advocacy of the application of mechanization in the agricultural sector for sustainable food production is now paving its way and being strengthened by various government and non-government interventions", said project leader Dr. Amongo of CEAT, UPLB.

She also mentioned that the level of mechanization can serve a basis in planning and decision-making for efficient utilization of finite government resources.

Computing level of mechanization, and identifying mechanization gaps

Survey served as a tool to identify the level of mechanization parameters from the rice and corn farmers which is important to the computation of the agricultural mechanization index. Results showed that farmers recalled the most recent cropping season activities, and that some farmers have little to no knowledge on the technical information of the machine being used such as the machine efficiency and horsepower.

In line with this, the project team recognized the need to coordinate and verify data from the offices of the municipal agriculturists, and machinery custom service providers in the region.

Project activities such as inventory and collection of available data, development of survey instrument and sample plan, and establishment of the target level of mechanization among others were done to achieve the objectives of the study.

As explained by Dr. Amongo, for the computation of the MAMI of rice and corn, parameters were considered which include soil type, crop variety, windows of operation, operational hours of the machine, crop yield, cultural practices on crop care, machinery efficiencies, crop water requirement, and source and utilization of power. Through this, the team also identified the computed level of mechanization from different power sources in Region IV per farm operation, and computed the actual AMI per crop and province.

Developing Database Management and Information System

The Database Management and Information System (DBMIS) was developed by the project team to encode, process, and analyze data. The data collected from the survey were verified then encoded into DBMIS to generate data for interpretation, processing, and analytics. The level of mechanization will automatically

be computed for the rice and corn production systems for each province.

Using DBMIS, the level of mechanization of each province in CALABARZON and MIMAROPA were automatically generated. It also gives the ideal or target level of mechanization to achieve a target yield. It was found that CALABARZON and MIMAROPA availed loans from cooperative and micro-lending facilities for their farm inputs and labor to improve production. The results showed that the common problems in these areas were mostly because of weather, climate change, low selling price, and pests and diseases.

UPLB conducted knowledge transfer and training on the use of the DBMIS with 103 participants composed of DA-regional field offices, attached agencies, state universities and colleges, and local government units. During the training, the formulation of technical and administrative protocols was consulted with the primary stakeholders involved in agricultural mechanization.

Policy recommendations were also provided based on the findings presented in the study that are consistent with the administrative and technical protocol and methodologies used by Dr. Amongo and the team. ■

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Using DBMIS, the level of mechanization of each province in CALABARZON and MIMAROPA were automatically generated. It also gives the ideal or target level of mechanization to achieve a target yield.

PHOTO COURTESY OF UPLB

Increasing papaya robustness to adapt to climate change

REYNER JOSHUA B. VALENTIN

Papaya – a fruit so delicious and refreshing that it has been hailed as the 'fruit of the angels' by the explorer Christopher Columbus. Not only is papaya rich in flavor with a deliciously sweet and soft butter-like texture, but it is also rich in Vitamin C, A, B, E, and K as research suggests. This makes papaya one of the healthiest fruits a person can consume as it strengthens the immune system.

Due to its beneficial properties, papayas have been developed into diverse products such as soaps, shampoos, lotions, and teas allowing the people to receive and enjoy its benefits in various ways.

To ensure that people may continue enjoying the benefits that the 'fruit of the angels' offer, developing papaya varieties that would be strong enough to adapt the effects of climate change is a must.

As fate would have it, an ongoing research titled, Developing Papaya Varieties/Lines Resistant/ Tolerant to Drought, Waterlogging and Strong Wind for Climate Change Adaptation, being led by Dr. Pablito M. Magdalita, along with the Institute of Crop Science

PHOTO COURTESY OF UPLB

and Institute of Plant Breeding-University of the Philippines Los Baños per directive of DA-BAR, aims to strengthen papayas to secure its survival for the biggest threat the world is facing, climate change.

For a country that is visited by as much as 20 typhoons each year, the development of drought, waterlogging, and strong wind tolerant varieties could minimize or reduce crop casualties that affect the livelihood of our farmers.

Developing *papaya* tolerance for drought, waterlogging, and strong winds

The non-stop rainfall during the typhoon season back in 2020 made the screening of waterlogging tolerant papaya variant possible by subjecting three to four-week old seedlings to waterlogging for almost two weeks. After allowing the seedlings to grow further in a nursery, they were then planted in the field for further observation.

During the same season the typhoons Rolly and Ulysses took plight in the Philippines with winds as fast as 171-220 kph. The surviving plants were then selected for its strong wind tolerance for further studies.

However, no matter what the plant is, it is still susceptible to very strong winds. With this, three component strategies to mitigate strong wind damage were identified by the researchers. These are: 1) intercropping of papaya with perennial crops, 2) planting of barrier crops within the perimeter of the papaya field, and 3) planting of semi-dwarf papaya plants intercropped to taller perennial plants. Planting of these selected lines of semi-dwarf papaya plant is advantageous as they can escape strong winds by staying low, therefore, having less possibility of being trampled down.

The depth of research led by Dr. Magdalita, it ascertained and assessed the use of purification and hybridization to understand the inference of uncertainties and adverse conditions through extensive field trials and micropropagation.

On the other side of the spectrum, the development of drought tolerant lines planted in Laguna produced many fruits even when the putative drought tolerant variety were exposed to drought and rainfed conditions.

Plants that show abundant fruiting despite the exposure to drought and rainfed conditions were then selected and used for further breeding and purification.

Upon observation and comparative analysis of fruit characters of the putative drought tolerant papaya plants exposed to multiple conditions, it was discovered that there were no significant fruit character differences when exposed to drought and non-drought conditions. This reveals that even when the drought tolerant lines were exposed to drought–rainfed conditions, the plants were still able to produce fruits that are marketable and of good quality when compared with the non-droughted. ■

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Maizinc inoculant increases corn yield in zinc deficient areas

ROBERT NEPOMUCENO, APOLONIA A. MENDOZA, AND REYNER JOSHUA B. VALENTIN

Living in the Philippines means that you probably know corn very well and have most likely seen corn on a daily basis on the street on your way home from work or school, or even when you're at home watching a movie as a corn vendor pass by outside.

Corn is used in many products that we all know and love. It is used to make candies, pastries, and even the breading for your fried chicken. And, of course, how could we forget the most iconic movie time snack, popcorn.

Thanks to corn, we get to indulge ourselves in these amazing products. But what if I tell you that all of these might cease due to the soil they are planted on? Corn is susceptible to soil zinc deficiency and to make matters worse, the Philippines is known to be one of the countries considered to have a widespread soil zinc deficiency issue according to the Global scale of zinc deficiency (Philips, 2015).

Humans, plants, and animals need zinc. For humans, without it, one would feel under the weather and would not function right. Now imagine that, but this time, it's about plants. Zinc deficiency in plants can hinder their growth and potentially kill the plant if not corrected.

Corn farmers depend on zinc fertilizers to treat zinc deficiency but are found ineffective in degraded soils with high soil pH since alkaline pH favors the conversion of zinc fertilizers into forms unavailable for plant use. In fact, zinc availability decreases a hundredfold per one-unit increase in pH.

This is the reason why the University of the Philippines Los Baños-National Institute of Molecular Biology and Biotechnology (UPLB-BIOTECH) conducted research to develop plant growth-promoting microorganisms to solubilize unavailable forms of zinc in the soil. The UPLB-BIOTECH team led by Dr. Marilyn Brown developed an inoculant known as Maizinc that serves to enhance the zinc uptake of corn in degraded soils and zinc-deficient soil. This effectively supplements the soil to have enough zinc for corn to survive in order for everyone to continue reaping its glorious benefits. The bacterial isolate responsible for zinc solubilization in Maizinc is a multi-trait plant growth promoter capable of solubilizing zinc and also help in nitrogen fixation. In addition, it also exhibited in-vitro anti-Fusarium activity. As such, Maizinc can serve both as a zinc and nitrogen fertilizer and also a potential fungicide.

Field testing in various areas revealed that the use of Maizinc and half the recommended rate of nitrogen fertilizer, such as urea, has 10% more yield compared to corn applied with the recommended rate of fertilizer. Moreover, based on the research conducted, corn plants treated with Maizinc increased the corn kernels' zinc concentrations by up to 30% which is comparable to commercially available zinc biofortified corn hybrids. Thus, Maizinc not only saves money, it also makes corn more nutritious. Not only that, Maizinc inoculant can be used in heirloom varieties, hybrid, OPV, and locally developed varieties. Regardless of the corn varieties, one prefers to plant; Maizinc is here for plant nutrition needs.

The registration of Maizinc with the Fertilizer Pesticide Authority is still in process. Despite that, it did not hinder Ms. Rosemarie Lunar a participant in the project's field testing and an early beneficiary, from using the product. She found it to be effective and is now very keen on using the inoculant on her corn farm.

Other groups are also interested in promoting and distributing Maizinc in the Cagayan Valley region. Agricultural corporations from the United States, Russia, and Canada also expressed their interest in the distribution of Maizinc. However,


PHOTO COURTESY OF UPLB-BIOTECH

Field testing in various areas revealed that the use of Maizinc and half the recommended rate of nitrogen fertilizer, such as urea, has 10% more yield compared to corn applied with the recommended rate of fertilizer.

the team decided to work on the product's registration first and upscale its production before its commercial production and distribution.

If Maizinc being a zinc, nitrogen, and fungicide alternative, does not pique interests, then maybe the results in savings would. The projected cost of the inoculant is PhP 100/100 grams. Five packets of Maizinc are required per hectare.

Corn farmers need about PhP 12,400 per hectare for fertilizers but with Maizinc, farmers would only need PhP 6,700/ha, resulting in savings of PhP 5,700/ha.

Given that soil zinc deficiency affects half of the world's arable land, and dietary zinc deficiency is one of the most observed micronutrient deficiencies globally, the technology has the potential to benefit not only Filipino farmers but also farmers from other countries who are equally struggling amidst the surging price of fertilizers brought about by the Ukraine-Russia conflict.

Maizinc reduces reliance and application of chemical fertilizers which leads to an increase in income for farmers making it one of the most effective economical path corn farmers could take. ■

Adapting community rice seed security in climate-vulnerable communities

DIWA J. VELASQUEZ

To generate technologies for the mitigation and adaptation of climate change, the Rice Watch Action Network, Inc. (R1) developed a technology titled, Enhancing Community Rice Seed Security in Three Selected Seeds Deficit and Climate–Vulnerable Communities in the Philippines. It aims to improve community rice seed security as a climate change adaptation solution, and improve rice seed availability, quality, varietal suitability, and access of farmers in climate-vulnerable and seed deficit farm areas in Irosin and Sta. Magdalena, Sorsogon, and Ormoc City, Leyte.

Report shows that from 1970 to 2012, the agriculture sector suffered due to climate-related disasters, including the destruction brought by El Niño, as well as stronger tropical cyclones which led to farmers receiving recovery support and subsidies like seeds. However, the lack of post-harvest quality was

also an issue. In some areas in the Philippines, low germination that compromised the seed buffers, and achieving and maintaining seed security were also major concerns.

Supporting immediate recovery assistance

Following the Climate Change Research and Development Agenda of Department of Agriculture-Bureau of Agricultural Research (DA-BAR), the technology also addresses the improvement of the adaptive capacity of the farmers and fisherfolk through provision of relevant technologies and information, particularly on seed production, access to more seed varieties for trials, mass production and storage, and seed enterprise development.

The technology contributes to the realization of Farmers' Right and the Global Plan of Action on On-farm Conservation and Sustainable Use by conducting Participatory Varietal Selection (PVS) with the use of farmer's varieties, traditional, and certified seeds. In addition, the seed documentation during PVS will be linked to the ongoing Climate Information Services (CIS) where local government partners in the areas help to statistically evaluate adaptability of farmers' seeds to different seasonal climate conditions.

The information gathered from PVS and CIS will then be inputted in a catalogue and the Seeds-Climate Decision Support tool—a way to enhance transparency of data to make use of available seed passport information to farmers towards a more informed decision making every cropping season.

Through these data collections, R1 will be proposing a Community-based Seed Reserve System to install a community preparedness mechanism to support immediate production recovery assistance after a disaster or at any given time with corresponding seed enterprise. Thus, ensuring that the seed storage is also a resilient storage place.

Finding best seed varieties

Proponents conducted seed security assessment by distributing questionnaires adapted from Food and Agriculture Organization. This is to look into each element with some additional criteria from R1 particularly on the varietal suitability to integrate adaptability to different projected seasonal forecasts. R1 was also able to do a varietal diversity map across different timescales and revealed a narrowing genetic varietal resources over time.

Participatory action research was also done to assess the best seed varieties that perform well in the three areas given the different climatological conditions. With PVS serving as a tool to characterize seed varieties, five farmers continued to conduct the PVS trials in four barangays.

In Sta. Magdalena, Sorsogon, four farmers conducted the PVS trials, while six farmers conducted seed production from barangays San Antonio, San Bartolome, San Isidro, San Roque and Salvacion. The farmers planted 30 of their preferred formally released or recommended varieties and farmers' selections.

Meanwhile, in Ormoc City, Leyte, most of their seeds came from the PVS trials of Sta. Magdalena, Sorsogon. Only two of the trained local seed producers conducted the PVS trials and one for seed production due to water shortage.

To also strengthen the capacities of Climate Resiliency Field School graduate farmers on seed conversation, management, and seed production, R1 conducted an online refresher course on post-harvesting and storage processes and techniques and management.

The results of the PVS were also matched with the climate data records of the municipality. Weather data and cultivar were used to extract bioclimatic variables for each growing season. These were used to generate weather scenarios and explore how seasonal bioclimatic variables are affecting yield.

Using these data, the technology also aims to achieve the development of a computer based application model that will guide local government units (LGUs) and farmers on palay varieties that are matched well with the upcoming cropping season's climate forecasts. With this, the utilization by the LGU can enhance its climate advisory services.

Through this project, R1 hopes to strengthen farmers' role in seed conservation and development and also improve seed security, especially varietal suitability and quality at the community level. ■

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Enhanced milkfish seed production through improved aquaculture technology

FREDERICK B. MUYOT, MARIA THERESA M. MUTIA, AND JAMES CARL H. ARESPI

When you think of bangus, you immediately think of Dagupan — the World's Bangus Capital, right? But, there are other regions that produce milkfish.

Undeniably, the Ilocos region is the country's top milkfish producing region with 116,796.79 metric tons in 2019. In the same year, the Philippines saw an improvement in terms of production output registering a hike of 3.74% compared to the 2018 production. According to the DA-Agribusiness and Marketing Assistance Service, the improvement is due to the increase in stocking rate in aquaculture in CALABARZON, as well as high market demand for frozen and marinated milkfish.

Quezon province is one of the major producers of milkfish in the region. However, like many milkfish producing areas, the lack of quality fry and fingerlings for stocking to nursery and grow-out ponds at certain periods of the year is one of the major problems affecting the milkfish farmers. This was further aggravated by the travel restrictions brought by the COVID-19 pandemic, thus resulting in shortage and higher price of fry and fingerlings.

Most of the nursery fish farmers in Quezon procure their milkfish fry from hatcheries outside of the province and, in many instances, majority of the fry are imported from Indonesia — one of the three top producing countries alongside Philippines and Taiwan. Unknown to many, Quezon has two milkfish hatcheries that could supply the needs of the nursery fish farmers.

Thus, to support the need for additional milkfish seedstocks in the province, the DA-National Fisheries Research and Development Institute (NFRDI) in collaboration with DA-Bureau of Fisheries and Aquatic Resources (BFAR) CALABARZON initiated the DA-BAR funded project, Enhanced Fingerling Production through Outscaling of Improved Milkfish (*Chanos chanos*) Hatchery and Nursery Protocols in Quezon Province.

Aimed at increasing seed production and income of hatchery and nursery fish farmers, the project introduced improved protocols for milkfish fry and fingerling production and linked village level hatchery and nursery in a cluster to facilitate efficient supply and marketing of fingerlings to the fish farmers.

In coordination with DA-BFAR CALABARZON, DA-NFRDI selected two milkfish hatcheries and seven nurseries in Quezon and linked it together as one village-level hatchery-nursery cluster. The hatcheries were located in Lucena City and Unisan, while the nurseries were in Padre Burgos, Agdangan, Unisan, Calauag, and Perez.

All of the milkfish fry were sourced from the two hatcheries and were reared by the nursery fish farmers to fingerling size, 5.08-10.16 centimeters, and sold to grow-out fish farmers in Quezon and adjacent provinces. This scheme facilitated the efficient supply of seeds until it reached the grow-out fish farmers.

Survival of fry and fingerlings in the hatchery and nursery varies between fish farmers due to variation in seed production methods. To standardize the methods to be used by the cooperators and achieve high survival rate, DA-NFRDI trained the hatchery and nursery fish farmers on the improved protocol on milkfish seed production established by the Southeast Asian Fisheries Development Center. They were also training on basic record keeping of production, expenses, and income.

Improvement in the hatchery protocols focused on strict monitoring of larval feeding to ensure adequate rotifer density is provided to the larvae at all times.

PHOTO COURTESY OF DA-NFRDI

Water quality is also kept at an optimum level through daily water change and siphoning of tank bottom.

Nursery protocols include the proper pond preparation to eradicate pests and predators, abundant growth of natural food, and appropriate feeding and water management for better growth and survival.

The project provided agricultural support and facility rehabilitation needed for the hatchery and nursery operations. This support was provided to operationalize additional larval tanks and nursery ponds of the fish farmers, which means all produced fry and fingerling through the project are additional production from their existing operations.

With the technology interventions introduced, the survival rate has increased from 25% to 46% in the hatchery, and 47% to 55% in the nursery. The two hatcheries produced an additional 11M fry and 3.6M fingerlings. The annual income from the hatcheries also increased from 4% to 70% or PhP 183,926 to PhP 379,603. While the annual income for nurseries increased from 16% to 26% or PhP 160,683 to PhP 229,061.

Aside from the ten cooperators of this project, 101 nursery cooperators benefited from the production of milkfish fry of the two hatchery cooperators. Meanwhile, the nursery cooperators supported the needed fingerlings of the 32 milkfish grow-out fish farmers. Around 91% of these fry and fingerlings were sold in Quezon, thus augmenting the need for milkfish seeds in the province. The produced fingerlings will translate into 540 metric tons of marketable sized milkfish for the local market.

With the adoption of an established protocol on milkfish seed production, the supply of good quality fry and fingerlings had increased to support the local milkfish industry, thereby increasing the fish production and income of fish farmers. This technology, therefore, is very ideal for replication in other milkfish producing areas in the country. ■

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Improved Fermente Biological Extracts

Science-based production of Fermented Plant Juices (FPJ), Indigenous Microorganisms and Fermented Fruit Exract with Developed Microbial Inoculants

funded under the DA-National Organic Agriculture Program

Key benefits of inoculation

Regulated Process

Users can control the microbial inoculants of a fermented biological extract

Microbial growth

Increases macro and micronutrients of the fermented biological extracts

High quality crops

Improves plant growth, flowering, and fruiting

More harvest

Increases the yield of various crops

Directions for use

Collect ***5 kg*** Madre de Cacao leaves.

Grind or chop leaves.

Dissolve ***2.5 kg*** of brown sugar in ***1.5 L*** of water. Add ***1 L*** of ***inoculum*** then mix.

Mix Madre de Cacao leaves and inoculum solution in a container.

Cover the con Harvest after

For more information, please contact **Dr. Mannix S. Pedro** through tel. no. **(049) 536 1576** or em

ed

Environmental sustainability

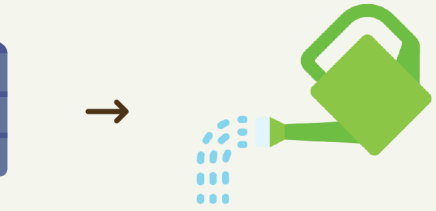
Significantly reduces the utilization of chemical fertilizers

Climate change adaptation

Buffs up crops to withstand climate changes such as high and low rainfall, and poor soil moisture condition

This new production protocol could change the lives of local farmers

Application of the improved fermented biological extract has proven to be effective in increasing the yield of ***okra, soybean, hot chili pepper, eggplant*** *and* ***bitter gourd.***



tainer.
30 days.

Shake well before use.
Use the bottle cap to measure the amount of FPJ to be used.
For one cap (10mL), mix with 2L of water;
For every bottle (250mL), mix with 50L of water.

Where can I obtain the inoculant?

The inoculants are produced at the **National Institute of Molecular Biology and Biotechnology (BIOTECH) - University of the Philippines Los Baños, Laguna.**

For inquiries, call +63 (049) 536-1620
or **message** biotech.uplb@up.edu.ph**.**

ail **mspedro@up.edu.ph**

Prepared and illustrated by Alexis B. Del Mar

Coping with the rising fertilizer prices, the organic way

BERNADETTE F. SAN JUAN, CESO II
DIRECTOR, NOAP-NPCO

PHOTOS COURTESY OF NOAP

Urea (46-0-0) price has gone up to 156% from PhP 1,153.59 per bag in April 2019 to PhP 2,959.16/ bag in the same month in 2022. Price of Complete fertilizer (14-14-14) increased by 85% from PhP 1,150.83/bag to PhP 2,130/ bag in April 2019 and April 2022, respectively. The rising prices of these synthetic fertilizers show no signs of retreating as the European supply market plummet and world market prices soar.

The Food and Agriculture Organization of the United Nations has warned of the serious impact of the ongoing conflict between Russia and Ukraine considering that the former is the world's top exporter of nitrogen fertilizers and the second leading supplier of both phosphorous and potassium fertilizers.

Russia's trade with the rest of the world has slowed down and has been disrupted as international companies pull out, and importers and vessel charters advertently redirect their businesses away from the country. Though prior to the conflict, there were already

There is an array of organic fertilizers and soil amendments to choose from such as compost, cow and chicken manure, vermicompost, concoction, microbial fertilizers, biochar, and wood vinegar.

pre-existing problems in the global supply market brought about by the restrictions during the height of the COVID-19 pandemic.

As prices in gas, a key input in fertilizer production, increase, production shortfalls also increase—driving fertilizer prices to increase as well.

Raw materials in the fertilizer market such as ammonia, nitrogen, nitrates, phosphates, potash, and sulphates have also increased by 30% in prices at the onset of this year. These and the high inflation from increasing food and fuel prices raise concerns over the capacity of our farmers to produce food for the Filipino people.

Such was the same concern that propelled the manufacture of synthetic fertilizers in the 19th century as industrialized nations find ways to increase food production to feed its growing population.

After World War I, the advances in the manufacture of ammonium, the main ingredient of N fertilizer, in Germany prompted France, Great Britain, and the US to follow suit which led to significant increases in food production yields. Since then, farming has always been associated with fertilizer use, and through the years, abuse.

The present constriction in the supply of synthetic fertilizers can be perceived as a disastrous consequence, or a promising opportunity to push forward certain agenda such as the use of organic fertilizers, and the practice of organic farming in general.

From a simple niche, the market for organic inputs has the potential to be expanded to conventional farms seeking to keep production costs at bay. This is an opportune

The challenge remains in changing the mindsets of our farmers. Converting to organic agriculture requires a lot of patience and commitment to regulate one's self to practice natural farming and to exert much effort to restore the natural fertility of soil.

time to promote organic fertilizers as cheaper, as much as they are effective, alternatives to synthetic fertilizers. There is an array of organic fertilizers and soil amendments to choose from such as compost, cow and chicken manure, vermicompost, concoction, microbial fertilizers, biochar, and wood vinegar.

The National Organic Agriculture Program (NOAP) of the Department of Agriculture is providing assistance in the form of agricultural inputs particularly molasses and African night crawlers used to produce organic fertilizers.

In 2021, the program has assisted 20 individual farmers and 83 groups in organic fertilizer production.

Currently, the program serves only organic practitioners, but is open to assisting conventional farmers willing to use organic fertilizers, whether in pure form or in combination with chemical fertilizers—hoping to encourage them to go natural or organic farming.

The Fertilizer and Pesticide Authority (FPA) is pushing for the Balanced Fertilization Strategy (BFS) to enhance crop production and promote efficient use of fertilizers.

With BFS and NOAP's assistance, we can expect lowered costs of fertilizers application and reduced reliance on inorganic fertilizers.

Moreover, the NOAP, through the Bureau of Soils and Water Management, provides composting facilities for biodegradable wastes (CFBW) and small-scale composting facilities (SSCF) to qualified local government units, farmer cooperatives and associations, and state universities and colleges.

Each CFBW consists of one unit of rotary composter and one unit of shredding machine with an operating capacity of 1 ton of wastes every day, and recovery rate of 60-70% compost.

On the other hand, each SSCF consists of 15 kilograms of vermi or African Night Crawlers, one unit of shredding machine and a 15-liter capacity vermi-tea brewer. These equipment and supply inputs are provided for free, while the recipients are required to put up minimal counterpart resources such as a shed and fencing.

While addressing the rising prices of fertilizers, using organic fertilizers can also address the deteriorating conditions of soils. Organic fertilizer revives soil health. It enhances soil fertility, provides better aeration, and allows growth of microorganisms that are essential to grow healthy plants. It is a form of a slow-release fertilizer that takes effect throughout the cropping season thereby reducing reliance on commercial fertilizers. It improves the soil's water-holding capacity and nutrient retention. The benefits are just immense.

The challenge remains in changing the mindsets of our farmers. Converting to organic agriculture requires a lot of patience and commitment to regulate one's self to practice natural farming and to exert much effort to restore the natural fertility of soil.

There are practices that need to be learned, relearned, and implemented. Practices such as diversification of farming system to include nitrogen-producing legume crops; incorporating farm animals that provide valuable manure and additional farm income; and establishing on-farm compost production using harvest wastes and manure may come across as tall orders to farmers that have been used to the instant gratification of conventional farming.

It is, thus, the mission of the NOAP to increase awareness and to persuade farmers to embrace sustainable practices such as organic agriculture not only as an option to reduce production costs or increase food security, but also to optimize land, enhance biodiversity, and safeguard human health. ■

Capitalizing off-season onion production

RENA S. HERMOSO

Off-season production is a means to provide both food on our tables and income to our farmers outside the planting season. Off-season produce also commands better prices. But when demand is stable and supply is overflowing, farmers take the short end of the stick.

Onion is one of the vegetables that has a steady demand throughout the year but which local production fails to fully capitalize on. Based on a study, the harvesting period of regular onion production in Aritao, Nueva Vizcaya —the Onion Capital of Cagayan Valley— coincides with the production in Nueva Ecija. Thus, creating more supply to a vegetable with a relatively stable demand, which is further aggravated by importation thereby lowering the price of onion during the regular planting season.

To augment farmers' income during the lean season and explore the possibility of exportation, the DA-Cagayan Valley introduced the off-season production technologies to the farmers in Aritao through the Community-based Participatory Action Research project funded by DA-BAR from 2017-2019. The success of this project led to its outscaling in June 2020 to December 2021.

"*Ang gusto naming mangyari ay huwag kayong makisabay sa* Nueva Ecija *sa pagtatanim para kayo ang pagmumulan ng* supply *tuwing tag-ulan.* At the same time, *kayo ay may kita imbes na tayo ay mag-*import," explained DA-Cagayan

PHOTOS COURTESY OF DA-CAGAYAN VALLEY

Valley regional technical director Rose Mary Aquino to the farmer cooperators.

The research team briefed 51 farmer cooperators in Bagabag and Aritao on the package of technology on off-season onion production and record keeping prior to the implementation of the project.

Off-season production starts in July with the preparation of seedbed. Sowing is in August, planting in September, and harvesting in December.

From the results of variety trials, the team introduced the use of the Super Pinoy variety suited for off season. It has bigger bulbs than Red Pinoy and can tolerate wet weather, thus recommended for planting for both regular and off season. This hybrid variety is also good for export.

To kill pathogens in the soil, double harrowing and plowing should be done twice with a 15-day interval coupled with solarization if possible. Seedbeds should be raised to 20-30 centimeters with 1-meter width, and 6-, 12-, or 18-m length.

To prevent high moisture levels due to continuous rain, the team introduced the tunnel-type rain shelter made with a plain round bar and polyethylene film. This can be used for five years.

The raised seedbed and use of rain shelter is crucial to avoid submergence and inoculation of *Gibberella moniliformis* Wineland that causes Twister disease.

They introduced Soil Laboratory Analysis as basis for the application of organic and inorganic fertilizer and application of calcium boron at 10 tablespoons per one sprayer load weekly from 30 to 60 days after transplanting.

The team also introduced the use of biocontrol agent, *Trichoderma spp.*, at three packs per spray load applied weekly up to three months in the off-season production. This is also done to minimize the occurrence of Twister disease.

After the project completion, "our farmer cooperators continued to adopt the off-season onion production and are willing to expand [the production] area at their own expense," shared Salvador Bulda, one of the project proponents.

Harmonization with Field Operations Division through the DA-High Value Commercial Crops banner program to include off-season onion in their [ESSETS], as well as outscaling to non-rice areas in Bagabag, Nueva Vizcaya and Sto. Niño, Cagayan were done.

"With the good results, 20 farmer cooperators in Bagabag, Nueva Vizcaya were added as adoptors in the outscaling project, 15 in Dupax del Sur, Nueva Vizcaya, 1 in Alfonso Castañeda, Nueva Vizcaya, and 10 in Sto. Niño, Cagayan," Bulda added.

The Provincial Local Government Unit of Quirino through the Office of the Provincial Agriculturist, one of the attendees during the off-season onion production training spearheaded by DA-Agricultural Training Insitute, demonstrated the said technology in their demo farm. The Local Government Unit of Ramon, Isabela also signified their interest in adopting these interventions.

"*Ang kagandahan po kasi ng* off-season, *maliit man iyong* area *na tataniman mo pero iyong ani kapag maganda ang bulas ng sibuyas iyong kikitain doon halos katumbas ng isang ektarya ng palay. Talagang kikita po ang* off-season," shared farmer cooperator Celestino Batallones.

"*Manipod idi* 2017 *adda met ti namitlo nga naitsambak iti panagmula. Apo nagmayat ti aglako ta gamin nu kastoy nga* off-season *nangina iti sibuyas. Haan nga kasla nu* regular, *kaduan na* PhP 20 per kilo *laeng. Ngem daytot kunak ti pinaglalako ti dagidiay panaglalabas* PhP 100 per kilo," shared farmer cooperator Ceferino Reyes.

(Since 2017, I was able to harvest onions thrice during the off season. It is a great opportunity to sell onions during the lean season because the price is high. Unlike in the regular planting season when you can sell one kilo for PhP 20, you can sell one kilo for as high as PhP 100 during the off season.)

Marjorie Warde, one of the farmer cooperators in Sto. Niño, Cagayan, also shared that they are set to plant onions again during the upcoming off season owing to the high income they were able to attain in the previous off season.

"*Idiay* area *ak nga* 120 sqm *ket adda ti naurnong ko nga* PhP 35,000. *Isu ti innayon ko ti* investment *idtoy* store *ko*," she happily added.

(With the 120 sqm land that I own, I was able to save PhP 35,000 from my earnings during the off-season production. I added that money to use as a capital for my sari-sari store.)

"*Nu mapadasan yon to, haan kayo nga agbabawi. Kasla kanya mi kitaen yo ket nag-e-*enjoy *na kami*," ended farmer cooperator May Cawagdan.

(If you try it for yourselves, you would not think twice [to adopt the technology]. Just look at our experience. We are enjoying [the fruits of our labors] now.) ■

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Low carbon swine farming system reveals cost-effectiveness

ANGELO N. PADURA

Next to rice, swine production is the second highest contributor in the agricultural sector of the country. In the past years, the demand for meat products has been continuously increasing along with the growing population. With pork being the most widely eaten meat, intensification of swine production and repopulation of hogs is needed to contribute in addressing the problem of insufficient supply of pork in the market.

However, the livestock sector faces a challenge as issues regarding the harmful environmental effects of livestock production caught the attention of different environmental sectors. A study conducted by the European Union Emission Commission, Joint Research Centre revealed that livestock production has an 18% contribution to the world's total anthropogenic Greenhouse Gasses (GHG) emission. Two of the most notable GHG emitted by the livestock sector are methane and nitrous oxide which have 28 and 265 times higher global warming potential than carbon dioxide respectively.

In response, DA-BAR funded a project titled, Life Cycle Assessment (LCA) of Swine Production toward a Sustainable Swine Industry in the Philippines, to recommend a low carbon swine production system that cost-effectively reduces the GHG emissions of the swine industry.

University of the Philippines Los Baños Foundation, Inc. (UPLBFI) focused on evaluating the GHG emission in the feed formulation and production, animal production, and the manure management systems of the swine production system.

Swine's life cycle starts from the birth of a newborn by a farrowed sow. After the newborn consumes milk from its lactating sow, the group of newborns or a litter is weaned from the mother sow as they start feeding solid feeds. The newly weaned litter will be fed according to their age and body requirement until they reach the target market weight as desired by the farm owner. Weanlings may be raised as finishers or fatteners until they reach the desirable market weight or be selected as replacement gilts or junior boars for the farm's breeder stock.

Executed in four phases, LCA is used to evaluate the environmental impacts, such as GHG of a product throughout its life cycle. Further, LCA quantifies the GHG emission of swine production and determines environmental hotspots along the production system.

Determining where the hotspots are

In the visited farrow-to-finish backyard and commercial farms, GHG emissions from feed production were considered by the UPLBFI researchers.

Along with the use of fertilizers and pesticides during crop production, the energy requirement of agricultural machineries during field operations, milling and packaging of feed mix, and transport in corn and soybean plantations contribute significantly to the total emission in the feed production system.

In conducting the hotspot analysis, another area explored by the UPLBFI is the animal production. In animal production, GHG emissions were accounted to enteric fermentation and energy usage in commercial and backyard farms.

Enteric fermentation, a digestive process through which carbohydrates are broken down into smaller units to be absorbed in the bloodstream, increases with the population of swine in the farm. As a result, higher emission of GHG is accounted to bigger farms than smaller farms.

Energy consumption of different equipment or facilities in the

PHOTO COURTESY OF UPLBFI

farm such as in-housing system, feeding system, and cleaning system also contribute to emission of GHG. Greater GHG emission was accounted to swine farms with more electrically-operated equipment and higher energy consumption.

The last area monitored by the UPLBFI is the manure management systems. Dependent on the manure management system in the farm, methane emission, direct and indirect nitrous oxide (N_2O) emission due to volatilization, and indirect N_2O emission due to leaching contribute to the GHG emission.

Based on the data collected, the manure management systems used in backyard and commercial farms visited include daily spread, liquid slurry without crust, pit storage, passive windrow composting, open lagoon, anaerobic digester, and septic tank.

Pit storage had the highest global warming potential while anaerobic digester had the lowest global warming potential.

Thinking of an environment-friendly and sustainable swine production system

After determining the various environmental hotspots, UPLBFI recommended a Low Carbon Swine Farm Production System. The system employs technologies in the feed production, animal production, and manure management that lessen the emission of GHG and at the same time, give a higher return of investment and shorter payback period to the farm owner.

In addressing the high GHG emission in feed production, utilization of low protein feed formulation supplemented with amino acids, and with partial substitution of soy bean meal with PECM can highly reduce GHG emission. For the manure management system, the DSAC model anaerobic biogas digester yields to high GHG reduction potential.

The low carbon swine production systems have a generally higher return on investment with a value of 37.88% for backyard farms and 36.75% for commercial farms than conventional production system, and shorter payback period of 2.64 and 2.72 years for backyard and commercial farms, respectively. Low carbon swine farm production systems were cost effective alternatives to the conventional swine production system as the study of UPLBFI suggests. ■

Limited no more: Batanes' *wakay* planting materials

MARIA ELENA M. GARCES

PHOTO COURTESY OF DA-BES

"*Ang aking bukid na may laking* 500 metro quadrado *ay natatamnan lamang ng isang klase ng wakay o kamote, sapagkat ito lamang ang* available *na pananim namin noon, at kumikita ako ng* PhP 4,000 per cropping," said Gregorio Ydel, age 51 from Uyugan, Batanes.

Traditional sweet potato varieties have adapted to the erratic weather conditions in the province which have always been a part of the Ivatan farm production system. Of the 16 traditional sweet potato varieties in Batanes, only 11 of these are available today.

Like any other farmer, Manong Greg, only practiced what he learned from the Ivatan elders who were also wakay farmers.

"*Sa pagtatanim ng wakay, wala kaming sinusunod na haba ng* cuttings *basta yung* vines *na pwede ng itanim. Hindi rin kami naglalagay ng* fertilizer, *at ang sinusunod naming* planting distance *ay isang hakbang lamang. Hindi rin namin pinapansin ang mga peste ng wakay kasi hindi rin namin kilala*."

In 2019, the increasing number of tourists and locals trigger the drastic demand for sweet potato tubers and processed products which are not usually met because of the recurrent problem on low productivity and switching to other local commodities. Even at the height of the COVID-19 pandemic when the demand dropped, the available supply is still short.

While sweet potato is important as food security crop, a ready source of income, and a viable raw material for commodity-based processing activities established in Batanes, there is a 70% demand on planting materials but the overall supply is only at 40%.

The limited source of traditional sweet potato quality vine cuttings that are clean, healthy with no observable disease or damage, was addressed through macro-propagation technique, following the POT for sweet potato by the Department of Agriculture-Cagayan Valley Region, implemented by the Batanes Experiment Station and with funding support from the DA-BAR.

As one of the cooperators of the project, Manong Greg attended trainings on the different package of technologies for sweet potato farming and practiced the improved package of technologies (POTs) in his farm using the different traditional varieties of clean and disease free cuttings.

He excitedly explained his learnings and the results of the introduced improved POTs on sweet potato production.

"*Marami akong natutunan sa proyekto na ito, kabilang dito ang labing-isa na iba't ibang klase ng kamote na nakikita sa aming probinsya, na* introduce *din sa amin ang tamang haba ng* vines *na itatanim upang mapaganda ang pagtubo, may distansya din na sinusundan at ang* in-adopt *kong distansya ay ang* 30 cm between hills *at* 75 cm between farrow *dahil dito nakita ko ang kagandahan sa pagha-*harvest. *Tuwing tag-ulan sinusundan namin ang* 15 cm *na lalim upang hindi ito madaling masira at tuwing tag-init naman ang lalim na sinusundan namin ay ang* 20 cm *upang madali itong magkaugat. At ang panghuli kong natutunan ay nakilala namin ang mga peste ng wakay at kung paano ito masusulusyunan.*

"*Gumagamit din ako ng* organic fertilizer *upang ma-*preserve *at mapanatili ang* natural fertility *ng lupa, at hindi din makaapekto sa kalusugan ng mga tao*," he added.

"*Mula sa* 500 sqm *na pinagtataniman ko ng kamote, lumaki ito sa* 2,800 sqm *kung saan lahat ng* varieties *ng kamote ay nakatanim dito. Ang pagha-*harvest *ko ngayon ng kamote ay nakadepende sa dami ng* order *ng tindahan na pinagdadalhan ko. Sa ngayon, umaabot sa* 550 kg *ang aking* harvest *at naibebenta ko sa halagang* PhP 50 per kilo *kung kaya't umaabot sa* PhP 27,500 *ang kinikita ko sa isang* cropping," Manong Greg proudly said.

He emphasized that his income increased with the increase in his harvest through adoption of the introduced technology.

"*Sa pagsama ko sa* project *na ito, ako ay nakabili ng sarili kong araro, nakapagbigay ako ng* cuttings *sa kapwa ko magsasaka sa* barangay *namin. Nakatulong din ito sa gastusin namin sa pambili ng* feeds *ng aming baboy dahil ang mga non-*marketable *ay hinahalo namin sa pagkain ng baboy. Higit sa lahat, napaayos na rin namin ang aming bahay at nakatulong ng malaki sa pantustos sa araw-araw na pangangailangan ng aking pamilya*."

He hopes that more farmers will also plant the different traditional varieties of wakay in Batanes and shares with them his learnings and knowledge so that the next generation will also be familiarized and be proud of these traditional varieties found only in Batanes.

"*Raku kapamahemahes ko du ahensya nio du nakaraku nu naisidung na nu proyekto nio aya du kapaytaketeakey ko. Dios Mamajes du sidung as may paru pa sana u masidungan nio*," Manong Greg said in his native Ivatan dialect.

(I would like to thank DA for the trainings and assistance in improving our farm management. I hope you will continue to help more farmers and implement more projects and new technologies which we could adopt here in Batanes.) ■

For more information:
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What's new at DA-BAR?

GELINE NICOLE A. MORILLO AND KATHLEEN MAE B. BULQUERIN

As the designated R4D agency of the Department of Agriculture, the Bureau of Agricultural Research (BAR) prides itself in its dedicated officials and staff who is constantly discovering formulate and implement new technologies strategies, and improving the system so that it will contribute in enhancing and improveing the livelihood and quality of life of our farmers and fisherfolks and their families.

This is reflected not only in the performance of the bureau but likewise in its growing pool of career-driven individuals who show so much potential not only in the field of agri-fisheries but in their respective expertise as well.

One of our esteemed officials in the bureau, Joell H. Lales, received his presidential appointment as a full-time assistant director (Director III) on 7 March 2022.

He started his humble journey as an executive assistant, which equipped him with knowledge of the ins and outs of how the organization operates on a daily basis. He eventually had the opportunity to work with then Planning, Monitoring and Evaluation Unit (now, Planning and Monitoring Unit), lead the Program Development Division (now, Research Program Development Division), assume the role of a Senior Executive Assistant, and was eventually designated as the OIC, Assistant Director.

Let us have a look at how assistant director Lales sees his new role and how his extensive experience has prepared him for it.

How has your previous roles in the bureau contributed to shaping the leadership roles that you currently possess?

It is truly a humbling experience for me. It presents a lot of challenges and of course great expectations, especially when dealing with partners and more senior colleagues. But it helps hone me to be better, boosts confidence, and inspires me to do better and exceed my own personal expectations. Given this trust and confidence, it drives me to do more and perform better.

With your extensive planning background, how were you able to maximize and utilize the knowledge you acquired in your current work?

With my background as a planning officer, it equipped me with a more thorough and encompassing background of the bureau's operations and programs. It is easier for me to do managerial work with such inherent familiarity of the processes.

How has your background in technology management contributed to the current priorities of the bureau?

It allowed me to see through technology beyond a mere product or process generated through R4D but as a result of an intricate pathway the most important of which is its utility and adoption.

How would you describe your organization's culture?

It is vibrant and dynamic; it is very much alive and rich with new ideas and creativity.

How do you motivate your staff?

I get them involved, [because I believe that] everyone is a potential leader.

An epitome of a servant-leader, assistant director Lales has shown us that it takes a village to build a successful leadership within an organization. Driven by the bureau's core values of integrity, accountability, commitment, professionalism, and innovation, he has exemplified a type of leadership that inspires a healthy work environment and encourages growth that goes beyond the field.


PHOTO: RBERNARDO

Like our assistant director, some of the bureau's staff have also moved forward with their journey at BAR. With their new duties and responsibilities as new appointees, let's take a look at how they see this change in their career path and what they hope to achieve from their new roles at the bureau.

Ryan Joseph M. Abrigo
Information Systems Analyst II, Knowledge Management and Information Systems Division (KMISD)
DATE OF APPOINTMENT: 11 FEB 2022

I look forward to gaining more work experience in my new role in BAR.

Jocel Anne C. Yamson
Information Analyst I, KMISD
DATE OF APPOINTMENT: 11 FEB 2022

I hope to further enhance my programming skills. Since the industry is growing, I want to learn new languages that I can contribute to DA-BAR, particularly in systems development. Likewise, I can contribute to the progress of the bureau in terms of keeping up with the latest technology.

Maylen V. Cunanan
Agriculturist II, Research Program Development Division (RPDD)
DATE OF APPOINTMENT: 16 FEB 2022

I hope to gain new collaborations with R4D institutions and further improve R4D capacities that would uplift the lives of Filipino farmers and fisherfolk.

Glenn D. Dimayuga
Agriculturist II, RPDD
DATE OF APPOINTMENT: 1 SEP 2021

With my previous experience in the Technology Commercialization Division and the Research Coordination Division and now with my new role at the Research Program Development Division, I hope to gain further to improve my career and further contribute to the goals and objectives of the bureau towards improving the effectiveness and efficiency of the agriculture and fisheries R4D.

Vincent P. Visitacion
Administrative Aide VI, Administrative Support Services (ASS) - Supply and Property Unit
DATE OF APPOINTMENT: 1 SEP 2021

In my new role, I hope that I can gain new skills and knowledge to help me improve my performance and establish my self-confidence in my work as an employee of the bureau.

Marilou C. Oren
Budget Officer, ASS - Budget Unit Finance Unit
DATE OF APPOINTMENT: 16 AUG 2021

With my position as a budget officer of the bureau, I hope that I can have knowledge of how the Bureau is performing its mandate so that I can contribute more to the common good of our stakeholders.

Along with the new appointees are the freshest batch of equally hopeful and vibrant BAR employees. Coming from various fields and carrying different backgrounds, let's get to know this batch of promising talents who will eventually help the bureau in its mission as the agriculture's coutry's agri-fisheries lead R4D agency.

Kathleen Mae B. Bulquerin
Information Officer II, Office of the Director (OD)
DATE HIRED: 2 MAY 2022

Q: What takes up too much of your time?

A: Trying to resist the urge to watch any videos found (or recommended in some cases) in TikTok and Youtube and failing miserably at it.

Lorebelle E. Pidoy
Project Development Officer I, RPDD
DATE HIRED: 19 APR 2022

Q: What's something I would never guess about you?

A: I have a twin. You wouldn't have guessed it right away because of the many differences we have that sets us apart; I like dogs and she likes cats, she's fond of KPOP which I find no interest in, she is more talkative and I lean more on the quiet side.

Marc Lawrence E. Francisco
Project Evaluation Officer II, Research Coordination Division (RCD)
DATE HIRED: 28 MAR 2022

Q: If you could write a book about your life, what would the title be and why?

A: I chose that title simply because it mirrors my experiences in life. There are times that I didn't move and remained stagnant, without taking a "single step" and letting the opportunities slip beyond my grasp.

Lissy Ann H. Cantillon
Administrative Officer V, ASS - Human Resources Management Unit
DATE HIRED: 17 MAR 2022

Q: If you could only have three apps on a smartphone, what would you pick?

A: Zoom for my online classes, to ensure that I can still attend even though I'm not at home; Messenger, as my means of communicating with loved ones, colleagues, and classmates; and, GCash, for my online and cashless transactions considering that most of the transactions nowadays are done online.

Venus Kim H. Bania
Librarian I, KMISD
DATE HIRED: 16 MAR 2022

Q: Tell me about yourself in one sentence.

A: I am the type of person who wants to learn new things.

Kenneth A. Matchica
Computer Programmer II, KMISD
DATE HIRED: 16 MAR 2022

Q: What movie could you quote by heart?

A: "You don't have to be the smartest person in the world to know what love is." (Forrest Gump, 1994)

Alexis P. Gregorio
Administrative Assistant V, RPDD
DATE HIRED: 14 MAR 2022

Q: What three things do you think of the most each day?

A: First, the things that I am grateful for are food, shelter, family, and friends. The next one will be my life goals and plans that I want to accomplish. Lastly, the version of myself in the next five years.

Angelo N. Padura
Information Officer II, KMISD
DATE HIRED: 2 FEB 2022

Q: What's something you like to do the old-fashioned way?

A: I prefer writing a letter when expressing thoughts of love and appreciation toward very special people in my life.

Mico C. Allauigan
Administrative Assistant IV, OD
DATE HIRED: 14 JAN 2022

Q: What is your most random impulse buy?

A: Buying branded clothes because it gives me comfort and I can feel joy! Even if it's not on plan or it's not on budget.

Maria Ruby G. Lumongsod
Project Development Officer IV, Office of the Assistant Director
DATE HIRED: 10 JAN 2022

Q: What topic could you give an hour-long presentation on with little to no preparation?

A: I can give an hour-long presentation on How to do Effective Media Relations with little to no preparation because I spent 32 years doing that as my job.

Diwa J. Velasquez
Information Officer II, KMISD
DATE HIRED: 29 DEC 2021

Q: How will you describe your perfect day?

A: Crossing out all planned activities and tasks for the day in my planner before leaving the office.

Ronjie G. Broñola
Information Officer II, KMISD
DATE HIRED: 13 DEC 2021

Q: What song would you say best sums you up?

A: It will be It's My Life by Bon Jovi. I relate myself to the song, especially since the song's theme is all about standing tall for what you believe, even if it will be a struggle to do so.

BAR DIGEST
RESEARCH FOR DEVELOPMENT
DA-BUREAU OF AGRICULTURAL RESEARCH
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Diliman, Quezon City, Philippines 1104

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