

PhilRice Magazine

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of the Department of Agriculture—
Philippine Rice Research Institute



BRAVING THE WORLD OF DIGITAL FARMING

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ABOUT THE COVER

The dawning of Agri 4.0 brings both challenges and opportunities in equal measure. With inclusive technologies that transcend generations, our farmers will have to brave the new world of smart/digital farming with an open mind for transformative change.

This issue of the PhilRice Magazine shows how the different applications of digital agriculture can change how our farmers and other stakeholders are understood, supported, connected, made more resilient, and empowered along the rice value chain and food system.



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WE WANT TO HEAR FROM YOU!

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THE DIGITIZATION OF RICE FARMING

John C. de Leon
Executive Director

The Coronavirus pandemic and its quarantine-associated restrictions have only highlighted the importance of digital tools and solutions in keeping connectivity and learning and some economic activities going.

PhilRice has invested on broadband network and digital infrastructure much ahead of COVID-19's strike. This proved to be helpful in orchestrating work and enabling essential services to proceed in all its offices. More importantly, this capability enabled us to remain connected with our fellow food workers, other field operations partners, and our rice farmers and growers (see our Jul-Sep 2020 issue on Crisis-Resilient Rice Farming).

Dividends from our digital transformation initiatives – as part of the Institute's continuous improvement process or R4D innovative solutions footprints – also extend to our online platforms for knowledge sharing and learning; in keeping our digital communications and activities safe; in our farm-level apps releases; in upping our capacity for big data analytics; and our build-up toward digital or smart farming (also called Agriculture 4.0).

A study elsewhere that assessed the impact of the COVID-19 pandemic on farmers (SCBF and MSC, December 2020) recommended, among other interventions, that digital technology can help the affected farmers to access

information, markets, and finance. Training more farmers (or the willing members of their households) on the use of digital platforms can increase the use of similar services, and help ensure that no smallholder farmer or agribusiness will be left behind in the drive to improve their resiliency, competitiveness, and prosperity. The connection of agriculture to the food system, food security, even poverty reduction makes its transformation to a more dynamic and higher-growth sector a pressing goal.

"Agricultural transformation is a long-term endeavor involving changes in what is produced and how, how produce is aggregated and marketed, how services are provided and by whom, and how performance is measured." But as a June 2020 WB report on Transforming Philippine Agriculture During COVID-19 and Beyond also indicated, the "absence of a consistent and accessible system for outcome and impact evaluations makes it difficult to have objective public policy debates and to change the current approaches to agricultural policy in the Philippines."

Viewed under the lens of the DA's New Thinking and ONE DA reform agenda, "digital technologies can tackle multiple market failures prevalent in the agri-food system by greatly reducing the transaction costs of matching buyers and sellers across input, output, and financial markets in the food system, and can also improve the data-intensive process of farm

decision-making for resource allocation and management – thus shifting the opportunities for accelerated agricultural transformation."

The agricultural sector (per report of Deloitte and Scio, January 2020 on Transforming Agriculture Through Digital Technologies) is in the epicenter of a series of megatrends, which are reshaping the ecosystem and require a review of the priorities and operating model to respond to the challenges. And the increasing convergence of tech and agriculture ("AgTech") makes the industry attractive for new entrepreneurial initiatives, financial investment, and enterprise clustering.

The application of Information and Communications Technology (ICT) to agriculture or Smart Farming can undoubtedly support efficient production processes, and ultimately promote the general welfare of our people and benefit our smallholder rice farmers. In essence, digital agriculture relies on quality data to gather information, improve decision-making, enable innovative services, enhance communication among stakeholders, and accelerate the value of actionable information at scale. This bodes well with our mandate, and PhilRice will surely join in the push for more digital solutions to improve rice farming and help shape their inclusive applications in our country's rural context. •

A new Facebook page of the RCEF Extension Program was created to launch the *Palaywakin ang Galing* campaign online. The banner photo features the various services that the Program offers including training, scholarship grants, and strategic communication services.

Campaign to amplify rice knowledge reach launched

Learning to improve rice production is now made more fun and interactive with the April 1 launch of the digital campaign titled *Palaywakin ang Galing: #yunPALAYun* to promote the technologies and services of the Rice Competitiveness Enhancement Fund-Rice Extension Services Program (RCEF-RESP).

The key message of the campaign is that farmers should keep on learning so that they can plant “smarter” (not harder) using science-based and field-tested practices.

Through this campaign, farmers are expected to have increased awareness of government programs on rice farming technologies. This also aims to encourage farmers to avail of the training programs under RCEF-RESP, to enhance their knowledge, skills, and interest in farming.

Dr. Karen Eloisa T. Barroga, vice chair of the RCEF-RESP Technical Working Group and deputy executive director for development at DA-PhilRice, explained

that the campaign name is a word play of *palay* and *palawakin* (expand) to signify that the RESP is expanding in many areas.

The other key word of the campaign name, *yunPALAYun* (a combination of *palay* and *yun pala yun* expression), is designed to teach farmers the right farming technologies that can significantly increase yield and reduce cost of production.

"We know that our rice farmers are already good but we want to expand farmers' knowledge. We also want to expand the coverage of the RCEF Extension Program so that not only will the farmers benefit from this but also their spouse, children, and/or farm workers. We are also expanding our training methods because we don't want to be limited to training room or farm school settings, but through various media like online," said Barroga during the online launching of the campaign.

A webisode is shown at the RCEF Extension Program FB page and YouTube channel every Wednesdays at 3:00 PM featuring successful farmers from various areas in the country and PhilRice experts.

Barroga explained that the webisodes will highlight topics that may help farmers have better yield thru improved land preparation, seeding rate, and nutrient and pest management.

For farmers to have fun, some episodes will have a *Palaywakin Ang Galing* Trivia Challenge and prizes will be up for grabs.

"They could earn *sagana* points that they may collect and later on convert to mobile load through mobile virtual wallets like GCash and PayMaya," Barroga said.

Social media influencers who have a heart for farming also participated in the campaign. Vloggers such as Miss Earth Water 2020 Roxie Baeyens showcased a day in the life of a farmer with a fun twist.

The campaign also featured “Kwentong BayANI” to inspire farmers with stories from their fellow farmers.

- JULIANNE A. SUAREZ

Partnerships with SUCs energized

DA-PhilRice recently signed a Memorandum of Understanding (MOU) with the Central Bicol State University of Agriculture in Pili, Camarines Sur to establish a 5-year partnership on the conduct of rice R4D projects.

The wheels of interface with the nearby Central Luzon State University (CLSU) were also strengthened with the launch of a collaborative project on rice Science & Technology (S&T) Updates. This project is to develop enabling rice S&T policy recommendations that regulators could adopt and implement to benefit rice farmers and consumers, and help the country achieve food security.

CLSU and DA-PhilRice agreed to collaborate extensively on rice research, training, communication, extension, and human resource development. Another agreement with CLSU allows qualified students to do internship at the Institute.

Our Batac station and its host Mariano Marcos State University (MMSU) had reaffirmed their collaboration under an existing 25-year (2019-2044) agreement allowing us to use, develop, and manage for free a 10-ha experimental farm of MMSU, renewable upon mutual agreement. The farm should be used for research on rice and related dryland crops, demonstration farms to showcase technologies, seed production, and other R&D-related activities.

Dr. Maria Carla A. Ochotorena, president of the Western Mindanao State University in Zamboanga City also committed strong partnership with DA-PhilRice during a recent courtesy call of Midsayap Branch Director Dr. Sailila E. Abdula. The two agencies have



Vico Sotto rises at rice paddy art

Different rice varieties were transplanted and cared for to produce a new design of the rice paddy art at the FutureRice Farm.

Healthy seedlings of PSB Rc 10 (green variety) and purple rice were planted, sketching the face of Pasig City Mayor Victor Ma. Regis "Vico" Nubla Sotto.

On its Facebook Page, the DA-PhilRice FutureRice Farm recognized Sotto for advancing urban agriculture. The local government of Pasig recently partnered with the Department Agriculture to promote

urban farming through an architecture design competition.

Sotto is also one of this year's 12 global anti-corruption champions recognized by the US State Department.

Rice paddy art is regularly staged to create deeper appreciation on rice and to entice young generations to engage in agriculture.

Over the years, it has showcased pop culture icons such as Fernando Poe Jr., Coco Martin, Catriona Gray, and Piolo Pascual. - **MARY GRACE M. NIDOY**

an on-going 25-year (2017-2042) tie-up on rice R4D projects, not to mention agreements with the Central Mindanao University in Bukidnon and the University of Southern Mindanao in North Cotabato.

Elsewhere, we have valid agreements with the University of Eastern Philippines in Catarman, Northern Samar, and University of the Philippines Los Baños in Laguna for R4D collaborations. These schools are vital members of our national rice R4D network. -

JUNGIE A. DIAMSAY

The country has just celebrated the 500th year anniversary of the Victory at Mactan that helped complete the first circumnavigation of the world, and other related events collectively known as the 2021 Quincentennial Commemoration.

With the theme *RiceUp Pilipinas*, the Institute took part in the celebration by organizing a series of activities highlighting the significance of rice in the Filipino culture and society. The mostly online festivities were open to PhilRice staff and contracted personnel in all stations.

A song writing and singing contest dubbed *PalayAwitan*, and a spoken poetry competition dubbed *PalayTulaan* were sponsored. Winners of the competitions were declared in the April 21 culminating program. Bagging the prizes for both competitions were Aileen Shaye Fontanilla, Joillie Nicole Lacbayan, Klydel Barangan, and Christian Paul De Leon from PhilRice Isabela, whose entries depicted the crucial role of rice in agricultural development as a staple crop and a source of income among many Filipinos.

Another highlight was the *SarangGulay*, a fun kite-flying contest that celebrated the colorful and wide array of rice-based vegetables and crops. These food items are major components of *Palayamanan*, a food production approach that breathes science and art to the age-old way of life

Grand national celebration joined



PhilRice Deputy Executive Directors Jimmy P. Quilang (left) and Karen Eloisa T. Barroga (right), conferred a certificate to Christine Angel D. Damaso from the Internal Audit Unit during the awarding ceremony for the *PalayAwitan* singing contest and *PalayTulaan* spoken poetry derby. Such events, which are part of the 2021 Quincentennial Commemoration, showcased how rice is entwined with the rich Filipino culture.

and farming, which attests that Filipinos do not live on rice alone.

PalayTanawin, a non-competition event was also held, where top “must-see” farms from all over the country were featured thru social media. Aside from their scenic attraction and appeal, these farms were selected for adopting/ adapting recommended rice technologies that other farms could emulate.

All these festive activities were pursued to promote potential rice science tourism sites, rekindle nationalism in Filipinos, inculcate values for the common good, tighten the social cohesiveness of the

DA-PhilRice community, intensify social awareness, and foster creativity and innovation for food security.

The commemoration was legitimized under Executive Order No. 103 (s.2020) with the theme Victory and Humanity, represented in Lapulapu and his men’s triumph in the battle of Mactan, and the compassion of our ancestors in helping the first circumnavigators of the planet.

Also observed in April was *Panagyaman* Rice Festival or national celebration of rice harvest, and the Filipino Food Month. -JUNGIE A. DIAMSAY



PhilRice photo

Farewell to a great soul

“There is no national boundary in science. Hybrid rice technology belongs not only to China but also to the whole world. For the welfare of people all over the world...” (In Prof. Yuan Longping’s response to his Ramon Magsaysay Award for public service in 2001).

The Father of Hybrid Rice passes away at 90 after a lingering illness, May 22.

Prof. Yuan Longping whose discovery of the heterosis or hybrid vigor in rice has made an impact on the lives of Filipino rice farmers, died peacefully in Changsa, Central China’s Hunan Province. Based on studies, yield of hybrid rice planted in the Philippines registers 15% more

than ordinary rice. Our farmers have attained yield as high as 12t/ha using hybrid rice.

Considered a national hero and treasure in China, he also inspired generations of Filipino rice breeders to go beyond the limits of the crop and trailblaze the erstwhile unthinkable – commercial hybrids of rice. Prof. Yuan Longping opened the 1st National Hybrid Rice Congress held at DA-PhilRice in 2013.

May his great soul rest in peace; our heartfelt condolences to his bereaved family during this time of sorrow.

- PHILRICE WEB TEAM



Selected personnel from all stations participate in the 2019 refresher course in Statistics to equip themselves with proper research methodologies and analytical frameworks.

Digital decision-making tools in rice developed

PAUL JOHN P. VILLAMOR

Numbers don't lie.

As centerpiece of Philippine agriculture, availability of up-to-date statistics on the performance of the rice industry is of big help for decision-makers and other players to implement the next key programs, research activities, and interventions.

Accepting the challenge, DA-PhilRice has launched the Statistical Laboratory and Data Center (StatLab) and the PhilRice Data Analytics Initiative (RiceLytics) to respectively expand its data management and analysis capacity, and to provide rice Key Performance Indicators (KPIs) serving as baseline for policy formulation.

Confident conclusions

Established in 2019, the StatLab helped researchers to come up with more impartial evidence-based decisions through the provision of consultations, seminar-workshops, and other data science support services.

Nefriend Francisco, the then institute statistician, led the conduct of 24 traditional and online training in Nueva Ecija, Batac, Bicol, and Negros branch

stations. Among the refresher courses were in statistics, data collection, survey methodology, sampling and experimental design, and data processing and management, which were also packaged into training videos.

The StatLab will also construct a library of codes and syntax for commonly used statistical analyses applied to DA-PhilRice R4D studies, which will be collected and updated annually.

Newly designated statistician Aphrodite Ortiz said establishing a data analytics center is one of the next steps in upgrading the StatLab.

"It will focus on the development and implementation of a data lake architecture and data warehouse systems to centralize data, produce operational business intelligence, conduct advanced analytics, and provide a data archive platform," Ortiz explained.

Expanding the pool of statistical experts is also part of their to-do list to ensure the use of proper statistical methodologies and analytical frameworks of DA-PhilRice R4D initiatives.

Easily accessible, understandable

RiceLytics, a two-year project, is bound to provide essential KPIs on the status of rice farmers and rice value chain through an online data analytics dashboard.

"The challenge we would like to address is the unavailability of a comprehensive reporting system that can be easily accessed and understood by the public, especially the decision-makers," said Nehemiah L. Caballong, data analytics manager.

Caballong elaborated that there is a need for a system where rice insight seekers will only have to access a single reference portal that translates vast data and information into a comprehensive yet easy-to-grasp knowledge – through data analytics, that is possible.

The RiceLytics portal features historical, current, and predictive information about rice farmers such as basic profile, concerns, farming techniques, preferred technologies, aspirations, and capabilities. For the rice industry, data on rice area, production, yield per hectare, self-sufficiency, consumption, government goals, and future performance requirements can be viewed.

Inspired by the COVID-19 dashboard launched by the Department of Health, this will also reinforce the implementation of the Rice Competitiveness Enhancement Fund components handled by DA-PhilRice through the monitoring and evaluation of seed distribution and trainings.

"This system will become vital in developing relevant policies, laws, regulations, programs, interventions, research activities, and development initiatives," Caballong predicted.

Housed at the Socioeconomics Division, the project is funded by the Department of Science and Technology-Philippine Council for Industry, Energy, and Emerging Technology R&D. •

RICE ACROSS THE COUNTRY

COMPILED BY: JULIANNE A. SUAREZ



DA-PHILRICE AGUSAN



DA-PHILRICE ISABELA



DA-PHILRICE LOS BAÑOS

Bukidnon shifts to hybrid rice

A provincial briefing/workshop on the Integrated Rice Program and thanksgiving ceremony were held on March 23 in Malaybalay City, Bukidnon to recognize the province's support to the RCEF-Seed Program as it now shifts from inbred to hybrid rice production beginning 2021 wet season.

Dr. Caesar Joventino M. Tado, branch director, commended the LGUs in Bukidnon for their support to the program and hoped for continuous support for the shift to hybrid. Bukidnon was identified to have a high potential for hybrid rice production.

"It is a big challenge to inspire my co-farmers to adopt the use of hybrid rice. But I hope that we will still follow the mandate of our government because this is for our development and success," reassured Jose Panes, RCEF-beneficiary from Valencia City. • MARELIE D. TANGOG

"Farm Walks" introduce varieties

The March 23 and 25 farm walk activities showcased the location-specific hybrid and inbred varieties PSB Rc 72H, NSIC Rc 204H, Rc 508, Rc 510, and Rc 512 that farmers may adopt.

Under the Rice Development Initiatives for Cagayan Valley and CAR Environments Project for Dry Season 2021, the walks were done at the B.H. Roque Farm in Santiago City, Isabela and Jacob's Farm in Alfonso Lista, Ifugao.

Advisories on seed and land preparation were also featured.

Similar activities in techno-demonstration and learning farm sites were also conducted in April in Cabarroguis-Quirino, Echague-Isabela, Luna-Apayao, and Tabuk City-Kalinga. Health and safety protocols were strictly complied with to ensure the wellness of staff and farmers. • JOILLIE NICOLE B. LACBAYAN

Quezon farmers retooled

With Quezon being one of our low-yielding provinces, a series of training on the modern production of high-quality inbred rice seeds and farm mechanization was launched to help farmers increase yield and reduce their production cost.

Along with Department of Trade and Industry-Technical Education and Skills Development Authority Quezon and LGU Sariaya, the station carried out four batches of training from January 27 to March 5 to sharpen the knowledge and skills of 114 rice farmers in Sariaya and Tiaong on modern rice technologies.

With focus on the updated *PalayCheck* System, farmers also experienced hands-on learning activities on nutrient management strategies such as the Minus-One-Element Technique, Leaf Color Chart, and Rice Crop Manager.

They now look forward to attaining bigger yields. • RUBY MOSELLE O. TUMANGIL

[illegible]

To help buttress the resiliency of local farmers, 10-day weather forecasts from the PAGASA website starting April were mapped per municipality/city within Ilocos Norte/Sur to provide an easier access to the local weather outlook as agricultural activities are weather-sensitive. Through this service, farmers can

adjust field operations during good weather and prepare for the inclement periods.

The advisory is being disseminated through the DA-PhilRice Batac Facebook page, text blasts, and through the help of the municipal/city agriculture offices of the two provinces. • **DEEJAY JIMENEZ**

A total of 180kg seeds of 10 rice varieties have been delivered to the Camarines Norte Seed Growers Multi-Purpose Cooperative. Jointly established with the Coop were cumulative two-hectare demo farms in Daet, Talisay, and Sta. Elena towns with varieties for irrigated, upland, rainfed, and saline-prone areas.

or the Binhing *Palay* Farm, aims to promote the sustained use by farmers of high-quality seeds of climate-adaptive varieties.

R&D coordinator Rona T. Dollentas led the site inspection, mapping, and geotagging of the demo sites to constantly monitor their status and progress. • **MICHAEL L. SATUITO**

Partnerships with LGUs and other partner-agencies in implementing development initiatives in Bataan, Bulacan, Nueva Ecija, Pampanga, Tarlac, and Zambales are being strengthened.

in Bulacan,” said Mark Angelo A. Abando, Scaling Rice Development Initiatives in Central Luzon project lead.

"We are aiming to establish a system-based data of development needs and available interventions in the region that will later on lead to more LGU-led initiatives. The impact site will be located

Ten farmers each from eight towns in Bulacan will be trained on nutrient and pest management from May-August 2021. DA-PhilRice and its partner-agencies will also develop strategic packages of development interventions among selected LGUs in the region. • JULIANNE A. SUAREZ

Farmers in Negros Occidental achieved higher yields as a result of the study “Increased utilization of high-quality seeds to improve the Rice Seed System (RSS) in Central and Western Visayas”. Four farmer-cooperators of DA-PhilRice Negros – RSS recorded an average yield increase of 1t/ha.

his production expenses such as seeds, fertilizers, and transplanting costs.

Canugon's production proves that the use of high-quality seeds and other technologies will increase their yield and income.

Rey I. Canugon from Murcia, the station's host town, yielded 172 bags (45 kg), up from his usual 145 bags. His farm area was used as a techno-demo site. The project shouldered

The RSS project aims to improve the accessibility and availability of recommended and preferred rice varieties in Regions 6 and 7. • **NICOLE M. SURRIGA**

Around 100 farmers from Datu Paglas, Maguindanao were enrolled in the PhilRice Text Center (PTC), May 14.

The PTC promotion activity was conducted during the RCEF seed distribution and technical briefing. The farmers actively participated in the interactive activity where the purpose and registration process of the PTC was explained.

The local officials also welcomed the activity as the whole Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) is still in the transition phase. The digital communication platform is an essential tool to help BARMM farmers improve their rice production together with the support of the municipal agriculture offices. • SYLVIA THERESA C. QUIRING

The use of digital technologies and innovations is being leveraged in the processes of the DA, especially during the COVID-19 pandemic. Digital agriculture (Digi-Agri) is one of the key strategies of the Department to bolster farm productivity, promote efficiency, and transparency.

In an interview with Mr. Dennis Franco M. Layug, DA's senior technical adviser on information technology, farm digitization, and marketing, he sheds more light on this subject matter.



Dennis Franco M. Layug

DA Senior Technical Adviser on
Information Technology,
Farm Digitization, and Marketing

What is Digi-Agri, and how is DA operationalizing it?

Digital Agriculture is the use of emerging technological tools to digitally process and collect data within the agricultural value chain to promote faster, easier, and more efficient transactions and informed decisions through automation such as the use of artificial intelligence (AI), Internet of Things (IoT), data analytics, nano-technologies, 3D printing, cloud services, robotics, data science, and others.

The first step towards digital transformation is mindsetting. We need to make sure that DA employees, officers, and other stakeholders will embrace technological advancements since digitization/automation will create new set of skills and competencies and change some processes in the Department. DA has developed and created apps such as Unified Comprehensive Administrative System (UCAS), e-Kadiwa, DA Covid Monitoring and Reporting System, and many more. Agriculture 4.0 should be adopted so that we will be at par with agriculturally advanced countries.

According to the UN, by year 2050, there will be around 10 billion people in the world and the biggest challenge mankind will face is how to feed these people with less agricultural lands and very few people interested in agriculture. To attract younger generations to go into agriculture, farm digitization should be included.

In farm digitization, IoT, AI, and robotics will have to be applied. We are currently putting up the first DigiAgriponics Agri-tourism farm where these will be showcased.

As an expert, how do you see the role of digital agriculture in accelerating transformation toward a modernized and industrialized agriculture?

Other countries embracing Digi-Agri have successfully produced agricultural commodities using emerging technologies in hydroponics, aquaponics, aeroponics, and many more. These technologies help save water, conserve energy, and conform to environmental protection.

Digital agriculture and beyond

.....
MERVALYN O. TOMAS



To share my experience on digital hydroponics/aquaponics, I have created my own set-up in my backyard in Marikina City by putting up a small digital greenhouse where I use IoT, AI, simple robotics, cloud technology, data analytics, and automated fish feed system. I produce lettuce and tilapia and the only time I visit is when I harvest or germinate for the next seeds.

Digitalized urban agriculture can help produce much needed agricultural commodities even in highly urbanized cities. It is possible to grow vegetables, fruits, and fish commodities in buildings, rooftops, garage, or any other location with the help of mobile phones and internet.

What do you want to achieve with digital agri-transformation, and in what way?

We would like to help change the mindset of people by encouraging farmers, fisherfolk, and younger generations to embrace Digi-Agri. DA has to introduce and showcase proof of concepts (highly automated farms) in partnership with private institutions to attract more people and companies to produce agricultural commodities.

DA, thru the leadership of Secretary William D. Dar and Undersecretary Roldan G. Gorgonio, is instituting reforms to support Digi-Agri and help provide farmers with new set of skills and training courses including the use of newly developed agricultural applications.

We are hoping that advocating Digi-Agri now will be the start of adoption of 4th IR technologies for the future generation.

What sample model can you share, and what is its success story?

I have visited a farm in Taiwan inside a building. It has 14 layers or growbeds using advanced growlight technologies, AI, nano-technology, data analytics, bubble technology, 3D printing, and machine learning to produce different vegetables.

Also, in my own small digital backyard set-up, I harvest less than 500 heads of lettuce monthly and 300 heads of tilapia every 3 months. Our produce is being sold out in less than 10 minutes whenever we post on Facebook.

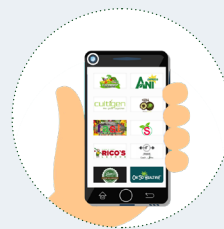


eKadiwa Online Marketing: How it works

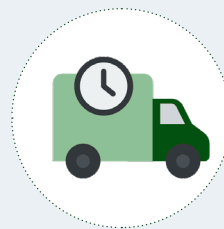
The eKadiwa platform serves as a conduit to make the marketing process easier for agripreneurs and consumers.



Vendors register to the eKadiwa online marketing platform, upload their products, choose who they want to deliver their products.



Consumers buy from eKadiwa website.



Grab or Lalamove picks up and delivers the product bought.

Hydroponically grown vegetables have longer shelf life, purely organic, and healthier. It's a good example of food security, food safety, food affordability, and food availability.

How has DA's Information and Communications Technology Service (ICTS) started upgrading the agency's management information system?

The Registry System for Basic Sectors in Agriculture (RSBSA) has been migrated into analytics and shall continue to improve in the next few months. 2020 was the banner year when we introduced dashboard analytics with real time data.

Distribution of our interventions is now being implemented using QR code (Voucher Management Platform) technologies with real time monitoring system and reports, coupled with dashboard analytics.

DA has been constantly improving and upgrading the servers for a more reliable backend, including cyber security system

with the assistance of big technological companies such as CISCO, Microsoft, Facebook, Amazon, and others without any cost to the government.

Launching soon is the Bayani Kita App, the most comprehensive app of DA so far. It has a feature called "Magsabi kay Manong Willie", where people can report and communicate with Secretary Dar. It also has "Bantay Presyo", weather update, and e-commerce feature where people can trade agricultural products and compare prices in different markets.

DA has also propagated the use of dashboard data analytics to provide decision-makers basis for more informed decisions.

Digital transformation is now at the forefront of what we do in DA to promote transparency and ease of doing business, and introduce farm digitization to prepare for the future.

Adoption of Digi-Agri will help more farmers and fisherfolk attain "*Masaganang Ani at Mataas na Kita*", and also help Filipino consumers. •

THE NEED TO BE SMARTER

WRITTEN BY: CHARISMA LOVE B. GADO-GONZALES
INFOGRAPHICS BY: JAYSON C. BERTO
SUBJECT MATTER SPECIALIST: DR. JASPER G. TALLADA

The landscape is evolving, unleashing opportunities and threats. In rice production, Margaret Thatcher's "May the fourth be with you" etches a special connotative meaning with the dawning of Agriculture 4.0.

At DA-PhilRice, the game-changing R4D is being pursued under the SMARTerRice or Strategically Modernized and Robust Technologies for Competitive and Secure Rice Industry Program. Rice production technologies will be massively integrated with information and communications technologies to bring solutions to growing population; threats to climate, environment, and health; and high fuel prices.

While Agriculture 4.0 is generally pictured as advancement in sensors, machines, information technology, and robots, the Institute embeds precision agriculture in this context of revolution by integrating packages of technologies (POT) suited for the irrigated and rainfed lowland ecosystems. Rice-based farming system models and value-adding technologies are also modernized for enhanced food access, income sources, and resiliency.



PROGRAM COMPONENTS

SMARTER RICE PRODUCTION TECHNOLOGIES FOR THE IRRIGATED LOWLAND ECOSYSTEM

- validate, integrate, and test the adaptability of the best POT under the irrigated rice environment
- POT tested on farmers' fields are those that were derived from *Palayabangan: The 10-5 Challenge* and the former CREATE-Rice Program, which developed practices on mechanical transplanting and direct seeding

SMARTER RICE PRODUCTION TECHNOLOGIES FOR THE RAINFED LOWLAND ECOSYSTEM

- test replicability of the POT under rainfed lowland
- POT to be prioritized are cultivating high-yielding rice varieties (NSIC Rc 160, Rc 216, and Rc 402) involving the mechanical transplanter, drum seeder, Minus-One-Element Technique, observation well, and pest management approaches

SMARTER RICE-BASED FARMING SYSTEMS (RBFS) AND VALUE-ADDING TECHNOLOGIES

develop the smarter version of the Sorjan cropping system model, climate-resilient vegetable production system, aeroponics vertical farming, prototypes and apps of improved value-adding technologies for rice and other RBFS products, carbonizer attachments for processing RBFS commodities

generate a compendium of existing and available value-adding technologies for rice and RBFS commodities, and of information on the quality characteristics of the improved technologies

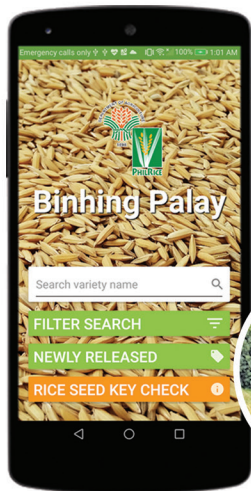
RICE FARMING 4.0

generate technologies applying information and communications technologies, digital electronics, mechatronics, IoT (internet of Things), apps, and robotics

develop mobile software technologies to improve decision support in crop production; crop micro-climate and greenhouse ambient monitors; and insect recognition and monitoring applications

craft drone application protocols for spraying chemical pesticides, seeding, and crop nutrition

produce models of field robots for tillage, seeding, and spraying



Floro B. Bernal
49, Farmer, Davao City

Born to a farming family, Bernal has known rice since childhood. Even so, he still considers himself a newbie who needs to “eat a ton of rice” before he could master the craft of producing it.

“I recognize that I still have a lot to learn and the farm management practices I knew as a young man may no longer be effective today. That’s why I researched a lot about rice farming. I also introduced myself to the local agriculture office so they could inform me on anything new about rice. That’s when I stumbled upon the Binhing Palay app,” he started his story.

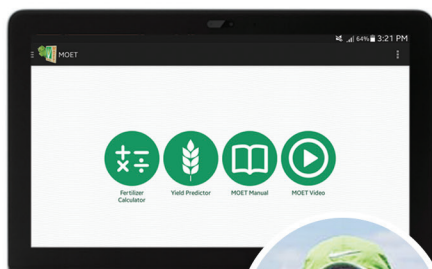
The app he’s referring to provides a list of locally released rice varieties with their agronomic characteristics, such as average and maximum yields, plant height, resistance to pest and diseases, milling recovery, and amylose content that determines the eating quality of cooked rice.

“Before, I was so innocent about these things,” he said.

Prior to using the app, Bernal admitted that he just planted any variety on his irrigated 5.5ha rice farm and consistently gained very low yields, of course. His neighbors also confirmed that in his lowland area, an 80-cavan harvest per hectare was already a jackpot.

“Hearing their testimonies I was so determined to prove them wrong—that we can produce better yields,” Bernal recalled.

Bernal later found out through the Binhing Palay app that what he had been planting were varieties fit for the uplands. Now, he plants hybrid rice varieties and always consults the app for their characteristics. “As a salesman, I always want what’s best. With the Binhing Palay app, I get to plant the best-suited varieties for my farm and always know what to say every time someone asks me about the rices I plant,” he concluded.



Sarah C. Villaflor

57, Local Farmer Technician (LFT)/ Chairperson, Moises Padilla Irrigators Association, Negros Occidental

Living in an area where only a few individuals have proper access to the internet, desire in mediating information to farmers drove Villaflor to seek various sources of science-based knowledge in rice farming.

“Many of us still lack the knowledge on modern rice crop management. Some even don’t bother learning them because they’ve been so accustomed to conventional practices or they don’t have the necessary means. As an LFT, it has been my dedication to help change the situation so rice farming can be more rewarding,” Villaflor said.

While also using several apps, Villaflor since 2016 found the MOET app more fitting in their area as it does not require internet connectivity.

“Many apps require the internet to generate recommendations, which proved challenging as we don’t have that often. With the MOET app, we can provide recommendations immediately without the internet,” she clarified.

Developed to complement the MOET Kit, the MOET app identifies deficient nutrients in the soil that limit the growth of the rice crop and provides precise fertilizer recommendations.



Bryan Kevin L. Fallares

24, Researcher, Zamboanga Sibugay

Having constant contact with farmers, it was Fallares’ curiosity about technology that brought him to adopt the Rice Crop Manager Philippines (RCM), *Binhing Palay*, LCC, and *eDamuhan*, which he discovered on Facebook in 2019.

“When I tried the applications, I was so optimistic that these could help enhance my knowledge in rice farming to become a better source of information for farmers. They’re even more useful

now as we cannot travel in groups owing to the pandemic. With the apps, we need not bring many things—we only need our smart phone to give recommendations to farmers,” Fallares said.

The RCM app provides crop and nutrient management recommendations according to specific farm conditions; LCC determines plant nitrogen, and *eDamuhan* helps identify and manage weeds. •

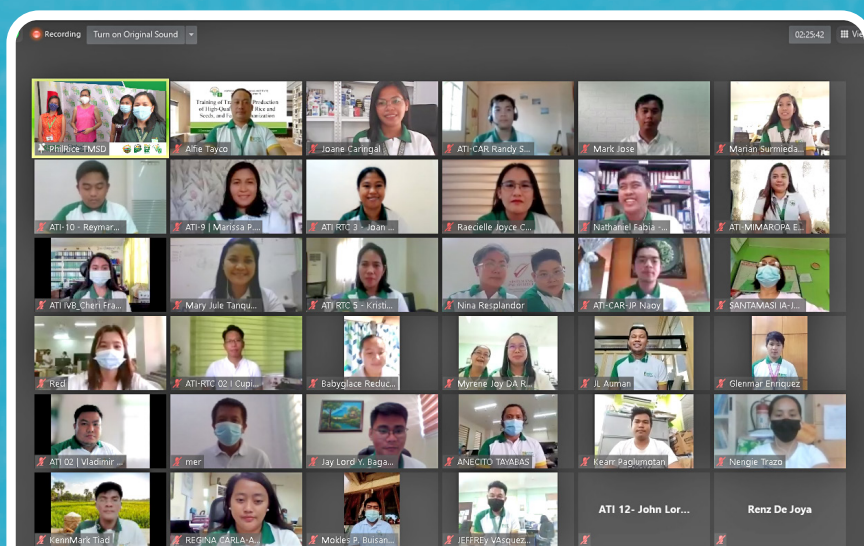
BRIGHT SOLUTIONS

CHARISMA LOVE B. GADO-GONZALES

Can you imagine that we could be actually living way back in the year 1723, as proffered by the Phantom Time Hypothesis? German historians in the 1990s calculated that the Middle Ages didn't exist and that we were then in the 18th century. As this global pandemic grinds on, would you wish that we were existing some 300 years ago when the world was younger than today? That would be magic.

Our solution though is not a time-related hypothesis or machine to cope with the killer virus. As futurist Arthur C. Clarke said, "any sufficiently advanced technology is indistinguishable from magic."

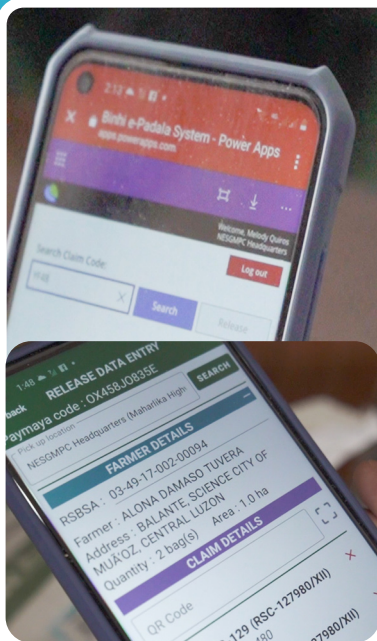
In delivering rice science and technology to farmers, extensionists, and the general public, DA-PhilRice has been optimizing Information and Communications Technologies (ICTs) for 15 years already starting with the Institute's Text Center. While in pandemic, ICT-based solutions such as Binhi e-padala system, virtual *Lakbay Palay*, *PalayAralan*, *PalayKamalayan*, and online training blended approach, used in continuously reaching the clientele had become more relevant. Just drawing enough magic for easier access to public service and rice-based knowledge through bright solutions.



#SAFETRAINING

The online blended learning approach of the Rice Specialists' Training Course (RSTC) helps me in knowing more about rice production, seed certification, and rice mechanization. The approach means a lot to me because it made learning safe amidst COVID-19. Although online, I have applied all the learnings to the field. With this set-up, I was also able to establish a techno demo while performing my duties in the office, to the farmers and to my family.

Maria Lourdes Mundoc, former RSTC trainee, Cagayan



#SMOOTH TRANSACTION

It's my first time to receive free seeds from the Rice Competitiveness Enhancement Fund-Seed Program. I'm happy that the transaction facilitated by Binhi e-padala was smooth for it didn't consume my half day. There was no long queue, unlike in usual relief distribution. I needed not risk my life in exchange for something free.

Marina Joson, farmer, Nueva Ecija



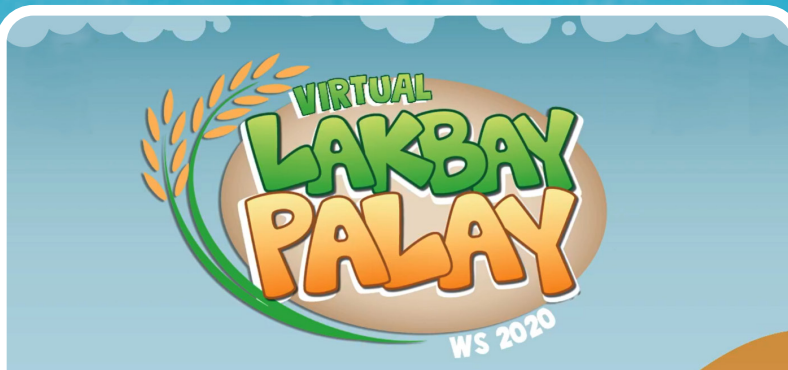
#EDUCATIONAL LANDSCAPE

PalayKamalayan is a proof that it is not impossible to deliver a complex topic such as rice science education to the general public. The webisodes are impressively simple, enlightening, and inspiring. Other than the truckloads of learning and realizations about rice, the manner by which they were conveyed motivated me to create similar materials, which I can utilize inside my own rooms. It's very relevant especially in today's educational landscape!

Emmanuel Santos, professor, Quezon City

Creative presentation of the PalayKamalayan webisodes caught my attention. The media contents increased my awareness and knowledge on rice science, and at the same time, these promoted appreciation and encouraged me to do acceptable practices on issues associated to rice. As communication researcher and educator, it's not too late for me to integrate agriculture especially rice science in my undertakings.

Rudolf Anthony Lacerna, Manila



#ONLINE TOUR

I learned a lot from the virtual Lakbay Palay. I did not need to visit DA-PhilRice. I learned about the technical aspects of rice production from land preparation until harvesting. I also became aware of the technologies developed by DA-PhilRice, which I shared to my students.

May Cabral, educator, Bataan



#ENHANCED LEARNING

In PalayAralan, I learned more about rice production, especially managing rice diseases. Through the livestream program, my understanding about the causes of viral, fungal, and bacterial diseases in rice and how to manage them was enhanced. As we are in a health crisis, I wish to help the farmers in our area increase their yield and income so I constantly share to them all the knowledge I gained from PalayAralan. I hope that this program will continue.

Herson Alvarez, agricultural extensionist, Bulacan

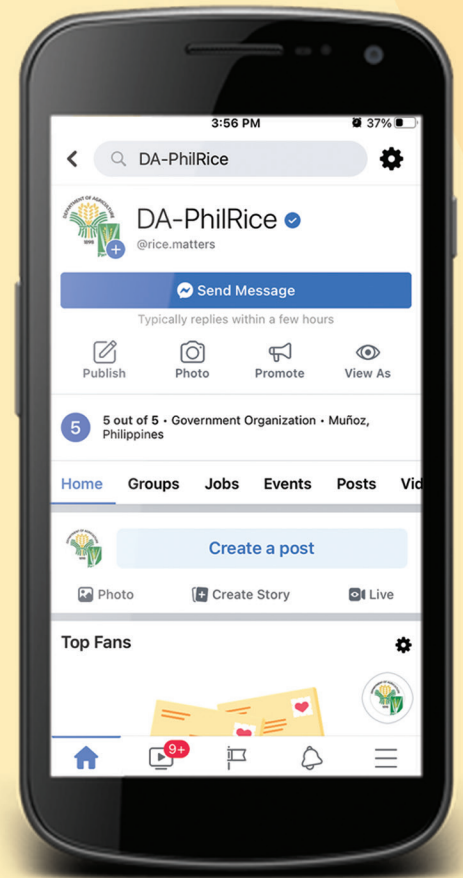
We are on Facebook

ALLAN C. BIWANG JR.

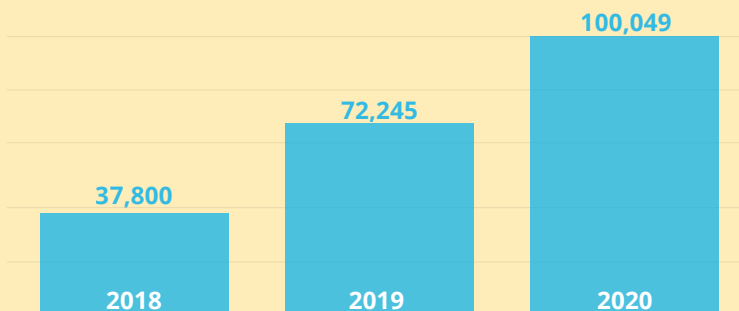
As social media use in the country expands, DA-PhilRice banks on the largest social networking site, Facebook, as complementary platform to its existing technology promotion initiatives.

Established in 2011 mainly to communicate rice science to its stakeholders, the DA-PhilRice Facebook (FB) page has evolved from merely informing and sharing knowledge on rice production to updating and engaging the public, especially the rice farmers.

Let us take a look at why we are sticking to this platform as a channel to provide science-based and doable recommendations to farmers.



DA-PhilRice FB Page Traffic



DA-PhilRice FB Page followers in 3 years

Followers have increased exponentially in the past three years. Key growth drivers include technology videos, such as rice-based mushroom production and machines, tips on rice pest and nutrient management, and RCEF-seed and extension program updates.

As of December 2020, the Page makes PhilRice the most followed DA family member on Facebook.

Who do we have on DA-PhilRice FB page?

Engaged clients thru FB messenger

In 2020, the page received more inquiries from farmers, which included topics on the Rice Competitiveness Enhancement Fund (seed delivery/distribution and training services), seeds and varieties, and nutrient management with 90% rate at 4h average response time. This reveals that the page is engaging the target group audience for its rice science-based information.

farmers

students/
researchers

agricultural
extensionists/
agriculturists





**Mae Cortina, 28,
Lal-lo, Cagayan**

Higher yield: making it happen thru FB

Farmers customarily ask their co-farmers when it comes to learning techniques especially when they see their neighboring farms yielding higher. But it's a different story for Mae Cortina. According to Mae, self-paced online

learning helped her learn new and effective farming practices for her 1-ha farm.

It was in 2020 when she discovered DA-PhilRice's FB page after seeing Rice Tips, an infographic type of advertisement on rice farming techniques recommended by the Institute. The post was on nutrient management. She immediately sent inquiries and had a great time discussing fertilizer application strategies with our online experts.

"One thing I will never forget from that day is I learned for the first time that right timing of fertilizer application comes with right combination. I was so grateful to whoever expert I chatted with on your FB page that day," Mae recalled, a newbie in rice farming.

She has been following advisories of DA-PhilRice experts and the new information from the technology videos she watched on the FB page. In fact, she proudly attributed the increase of her yield to the knowledge she gained from the online experts. From

an average of 60 sacks at 50kg/sack in the past seasons using inbred seeds, she recently amassed more than 100 sacks of fresh *palay* with hybrid seeds.

"I used hybrid this 2021 dry season but I am more than certain that without the guidance of your rice experts and the new technologies I acquired from your FB page, especially on nutrient management, I would have wasted the hybrid seeds and would never have felt fulfilled in rice farming," Mae affirmed. Based on record, more than 50 questions were received by the page from Mae Cortina since August 2020.

She also uses her smartphone's camera to take actual field photos of her crops and send to the page especially if she observes abnormalities on growth and leaf color. On Facebook, she only relies on rice farming information posted on DA-PhilRice and shared by experts she consulted via chat.



**Eligio Dela Roca Jr., 33,
Calapan City, Oriental Mindoro**

Instant rice information

Small farmholder and new-to-farming Eligio Dela Roca Jr relies on farming practices they learned from elders. Eligio manages his own farm for two years now. When he started in 2019, he was disappointed with 20 sacks (50kg/sack) yield from a 0.25-ha farm using his uncle's practices.

One of his frustrations every time he thinks of rice production is the near inaccessibility of rice technologists in

their city. He gets recommendations from them only when he has budget to buy cellphone load or to commute.

"There was one time that I was browsing on FB and I saw an online discussion from DA-PhilRice's FB page. I stayed for few minutes since I was getting new insights on rice production," Eligio shared.

The following days, he sent private messages to the page and eventually exchanged conversations with the rice experts on board. Chatting with online experts was more convenient for him and even economical as he can still engage even with free data using FB messenger.

Eligio is not your typical farmer-learner. He frequently sends photos of diseases, insects, and symptoms of nutrient deficiencies expecting to get word on preventive measures from DA-PhilRice.

"So far I am impressed with what I am getting from the experts you have. I would say that my 5-sack increase in yield in 2021 dry season was a result of my frequent consultation on your FB page," Eligio declared. He got 30 sacks during the same season in 2020 using NSIC Rc 280.

Improving contents, chat services

The social media team under our Development Communication Division plans to stimulate further engagement in its contents. For 2021, the team is supplying user-generated contents (UGC) that are more relevant and easier to understand. UGC come directly from champion farmers and partners.

To be able to respond even during non-office hours, the team is developing an automatic messaging tool or Chatbot service. According to Fredierick Saludez, technical chat expert, many messages are received when the chat team is offline. Automating it would improve the efficiency of our response time.

This Chatbot feature will be connected on Facebook Messenger that hopes to provide instant fertilizer recommendations, pest and disease management tips, and top varieties per region. •



Alicia G. Ilaga

Director-Coordinator

DA Climate-Resilient Agriculture Office

Digital agriculture for climate resiliency

CHRISTINA A. FREDILES



The Climate Change Adaptation and Mitigation Initiative in Agriculture or AMIA Program is one of the Key Strategies under the ONE DA Framework. Among the main focus of the AMIA Program is conducting regional and provincial climate risk and vulnerability assessments to identify proactive measures in adapting to changing climate and the hazards that it brings.

Its main approach is the establishment of the AMIA Village to serve as a lighthouse for adaptation and mitigation actions. Now, DA is pursuing to expand and use AMIA villages as building blocks of farm and fisheries clustering and consolidation and agro-industrialization in the whole country.

This writer spoke with Director Alicia G. Ilaga of the Climate-Resilient Agriculture Office (CRAO) to tell us more about the program.

How does the CRAO integrate ICT in climate change adaptation and mitigation amidst the pandemic?

Good thing that even before the pandemic, we already set up our Information and Communications Technology (ICT)

capability, making available our range of products, services, and tools to reach out to our focused groups. Hence, migrating to digital platforms is not totally new to us.

We also migrated to digital tools like the virtual videoconferencing platform to conduct our training activities and our recently launched mentoring sessions. The latter aim to equip our Focals in establishing and expanding AMIA Villages in consideration of the constraints brought about by the pandemic. Even our partnership launching was likewise transferred virtually.

Going back, I suppose it is more challenging for our regional counterparts as their functions essentially entail physical engagements, and there are activities that cannot be facilitated online. From time to time, they still do face-to-face interactions under strict compliance with the relevant IATF Omnibus Guidelines. The limitations from these are resolved to an extent by strengthening their available ICT tools.

Imagine that all of these pandemic concerns have climate change as a backdrop. We know that by itself, climate change is dynamic and has progressive concerns, hence, this inevitably adds up to the complexity of the contemporary matters relative to the pandemic which our AMIA Program is facing.

How much progress has CRAO made over the years in transforming local resilience in the community?

As of March 2021, there are already 96 AMIA Villages nationwide since the implementation in 2018. There are AMIA Villages in eight regions now ready for enterprise-development; like in Region 1 for diversified cropping, Region 2 for corn-based enterprise, and Region 10 for corn production with duck production (balut) as anchor, among others. We aim that we facilitate transformation through AMIA CREATE that carries our leveled-up vision which is Climate-Resilient Agri-Fishery Technology-Based Enterprises. In AMIA CREATE, ICT has an indispensable role in facilitating the access of the beneficiaries to climate information and technology toward climate resiliency.

During the height of the pandemic, in 2020, there were only 77 AMIA Villages wherein some areas were established in partnership with the Rice Watch Action Network. It was remarkable that despite the pandemic-related hurdles, there is considerable growth in the number of installed AMIA Villages. This increase is a testament that we have responded well in this new normal.

The Adaptation and Mitigation Initiative (AMIA) Village in Ilocos Region is one of the 96 AMIA Villages nationwide.

CASES OF TRANSFORMATION & TRICKLE-DOWN EFFECTS AT THE REGIONAL LEVEL

SPECIAL FARM WEATHER OUTLOOK AND ADVISORIES ON & DURING TYPHOONS THRU RADIO AND SOCIAL MEDIA



The adoption of the CRA practices in the advisories provided by the Regional Field Offices resulted in decreased agricultural loss and damage in the AMIA villages brought about by the typhoons.



SETS OF AUTOMATED WEATHER MONITORING SYSTEMS INSTALLED IN REGION 2

These can help improve the accuracy of localized climate information, products, and services in agriculture.

CLIMATE RISK VULNERABILITY ASSESSMENT MAPS COMPLETED IN 49 PROVINCES



These maps show the key climate risks in their municipalities; majority of the maps are accessible online.

In your opinion, how ready are we in the world of digital agriculture toward achieving the DA's climate change agenda?

When you go to the ground, the situation differs. Let me use the terminologies from the Diffusion of Innovations Theory that provides a spectrum of responses to provision of technology since it describes the same on the ground. There are communities that are adopters; some are early adopters, some early majority, some late majority; unfortunately, some are laggards. I cannot give you concrete statistics on that but that is observable on the ground. This situation can be explained by many factors - from economic reasons (lack of budget for sophisticated ICT) to personal (hesitations to use FB, fears of using mobile phones, and self-assessed low knowledge and skills). Speaking from our experience, it is not just the government at play in deciding whether we move forward with our ICT or not, it is also a personal enterprise - a deliberate, empowered choice of the farmers, LGUs, and other groups. And we respect and recognize the dynamics.

In relation to this, the answer is we, at the government, are ready. In fact, it has long been there as far as the AMIA products, tools, and services are concerned. But it is equally important to look at the other end of the spectrum, which is the readiness of the people on the ground. To address their readiness is also a concern for us in the

same way that to sustain the digital-ready capacity of the adopters is our thrust.

Future ICT plan to empower communities?

In the near future, we envision the farming communities as empowered when they practice CRA as a lifestyle, and the other AMIA tools, and products are part of their basic decision-making tools. In other words, they are already familiar with accessing them and skilled in interpreting the technical data. Even if just few of the farmers become empowered, it is already a sustainable community since they are already champions in knowledge-sharing, equipping, and advocating CRA with other local farmers. Hence, we intend to be purposive in equipping the farmers as champions. If this vision will happen, we expect that they can also raise up farmer champions within their group, especially the younger farmers. This then ensures the sustainability of the skills needed to be resilient with evolving agriculture, especially as affected by climate change.

They say that the name of the future ICT in the agriculture sector is precision agriculture where there is the integration of robots, moisture sensors, aerial images, and GPS technology. This can be a far future for us. Although some of these tools are being utilized now by the technical experts, farmers are still dependent on simplified data so the products of these tools can be meaningful to them. •

Outsmarting the double crisis thru smart farming

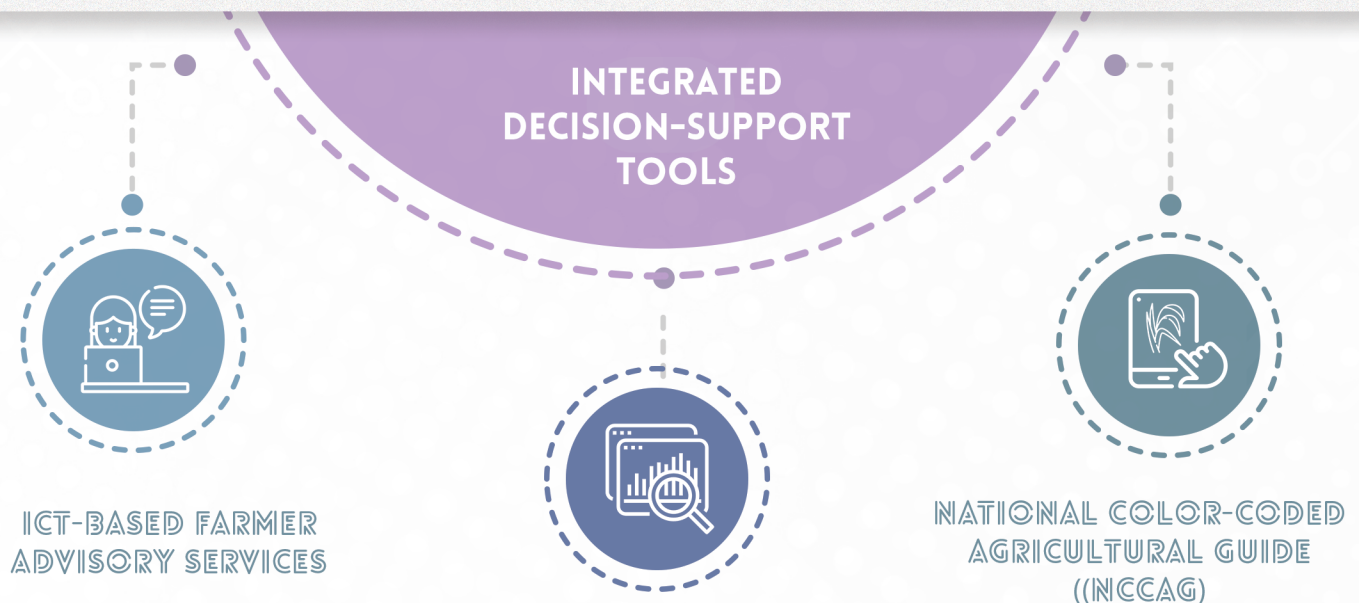
WRITERS: CHRISTINA A. FREDILES AND ALLAN C. BIWANG JR.

INFOGRAPHICS: JAYSON C. BERTO

SUBJECT MATTER SPECIALISTS: DIR. ALICIA ILAGA AND PRISM TEAM

Farmers are undoubtedly braving the new world beleaguered by two challenging crises – the COVID-19 pandemic and climate change.

Fortunately, DA and PhilRice have developed integrated decision-support tools tailored to help farmers overcome the onslaught of the double crisis.



One of the support services provided by the AMIA Program is the Climate Information Service (CIS). Published under the CIS Component are the Provincial/Regional Seasonal Climate Advisory and Outlook, and the 10-day Farm Weather Outlook and Advisory.

Trained personnel from Regional Field Offices (RFOs) regularly prepare these advisories using data from PAGASA, and disseminate them to farmers.

COST-BENEFIT ANALYSIS TOOL

This tool is employed in investment and technical briefs that can be accessed through this site:

<https://ciatph.github.io/#/crads/cba>. These technical materials can guide LGUs in their decision-making, and business groups to be on board in assisting communities to be climate-resilient.

CRAO developed a tool called the National Color-Coded Agricultural Guide (NCCAG) Map accessible through the link www.farmersguidemap.da.gov.ph. It was launched in 2017 and is currently being updated.

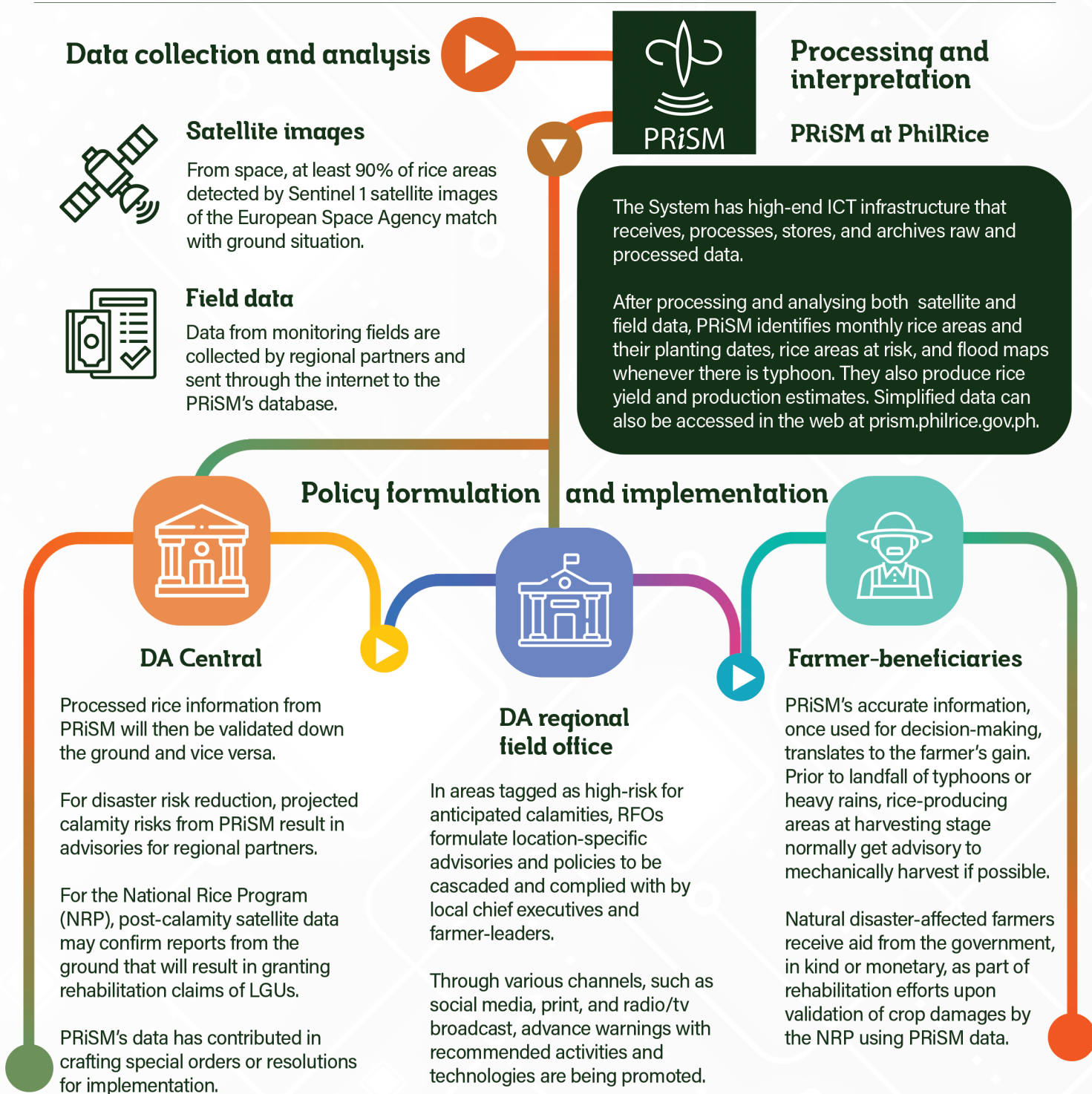
By formal definition, NCCAG is a database of map overlays that can be used as a decision-support tool and investment guide for various sectors, especially agriculture. It features 20 naturally suitable and economically important crops, overlayed in 8 identified climate-induced hazards.

PRiSM: an eye from the sky for decision-makers

To satisfy the country's need for a satellite-based rice monitoring system, the Philippine Rice Information System (PRiSM) was developed by DA-PhilRice and the International Rice Research Institute (IRRI). Since 2015, PRiSM has been regularly providing the DA and its regional field offices with rice area, yield, and production estimates

from the regional up to the municipal levels.

Recently, PRiSM has proved its worth during calamities and the on-going pandemic by ensuring the delivery of reliable, location-specific, and timely rice production information to DA and rice program decision-makers.



Of sensor-based farming:

A day in the life of its scientist

ALDRIN G. CASTRO

Waking up with the sporadic but persistent crowing of the roosters in the morning, walking on the streets where Mayon Volcano is visible, and working on the rice farm with his father, are some of the moments Dr. Manuel Jose Regalado carries as he works as one of the Institute's conferred scientists.

"I remember my father almost catching a fight with his fellow farmer when he opened a canal to irrigate his paddy field. It wasn't the other farmers' turn to irrigate yet," he recalled.

He kept this incident in his heart as an inspiration in the development of AutoMon, a technology included in Agriculture 4.0 or an agriculture landscape run by advanced technologies such as robots, sensors, aerial images, and GPS conveniences. With these devices, agriculture is made precise and would make farms more profitable, efficient, safe, and environmentally friendly.

Just a text message

AutoMon is an electronic device for measuring the paddy field water level by means of a sensor, logging the water level data, and transmitting the data via a wireless network to a server or to the water user. Through an AutoMon-based irrigation advisory service, farmers get to receive via SMS water level information and advice on whether it is time to irrigate.

Developed in the International Rice Research Institute (IRRI) with Regalado as one of the proponents, AutoMon is an offshoot of the Alternate Wetting and Drying (AWD) technology, in which farmers depend on an observation well to determine irrigation time. AWD implementers agreed that farmers find it laborious to always measure the water level manually, which reduced time for other farm work or non-farm activities.

Currently, AutoMon is under field-testing in 18 field sites in Nueva Ecija and Isabela.



7:00 am

On a regular weekday, Regalado, who did not dream of becoming an agri-engineer, would get ready to work.

"I wanted to be an accountant because it was my parents' dream for me. But I instead became who I am today because it was related to what we were doing on our farm," the time-tempered engineer said.

Regalado, the eldest, grew up in a family of eight. His father was a farmer owning 2ha and a businessman who sold fertilizers. His mother was a homemaker.

8:00 am

He sets his mind on the things he will do for the day such as finishing a proposal on technology transfer and commercialization of the machines they have developed.

"As I bicycle on PhilRice grounds going to the office, sometimes memorable moments like receiving the 2015 Maramba Award from the Philippine Society of Agricultural Engineers as the Most Outstanding Agricultural Engineer in the country come to mind. This motivates me to continue working," he confided.

Regalado in 1979 started his career as a research assistant in the UPLB's Agricultural Mechanization Development Program, College of Engineering, prior to his graduation.

"I will never forget my first salary, it was P742/month," he smiled.

The Philippine Scientific Career Council in 2009 conferred on Regalado the Scientist 1 rank. He joined PhilRice in 1988 as Science Research Specialist II in Los Baños. He has a master's degree in agri-engineering from UPLB and PhD in agricultural science from Iwate University in Japan.

8:30 am

He checks his email, usually receiving correspondence from the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development, IRRI, and the WateRice Team.

"Emails about the project are important to me as they keep us on track on its commercialization hopefully in 2022," the project leader calculated.

Regalado asserted that the key to perfect project implementation does not all rely on the technical aspect, but also on administrative matters. That is why he monitors if everything is on track, ensures proper budget utilization, and checks on balanced financial statements.

9:30 am

Works on field-related commitments such as visiting an AutoMon test site in nearby Bantug, Science City of Munoz, which is located along a road parallel to the irrigation canal. The team replaced the battery sensor, checked the water level, and verified the information transmitted by the sensor. When in the office, Regalado and his team conduct online meetings for project updates.

12:30 pm

Have lunch with his family. He takes a couple of minutes cycling from the office to his housing unit at the on-campus Staff Village.

1:30 pm

Often, he attends online meetings to talk about the project's financial status. In a meeting, he was informed to participate in the National Agricultural and Fisheries Investment Audit, along with other members, to audit machines that the DA had distributed in 2015-2019.

Most of his time is committed to writing journal articles and technical papers to be published.

"As scientist, it's our duty to contribute to the body of knowledge. Currently, I am working on my journal on hydro bio-ethanol distiller and co-authoring on multi-crop planter machine," he said. He had published more than 20 papers including a water management manual, in which AutoMon is a component.

6:30 pm

Regalado goes home, rests, and watches some news. He also responds to his fellow church members' group chats.

"Fellowships and service meetings are important to me because these are works of God, and they help me balance the worldly things with Godly pursuits," Regalado preached.

10:30 pm

Before calling it a day, he opens the Bible or a ministry book, reads some scriptures and messages, and thanks the Almighty for living a life with purpose.

"While working as an engineer at DA-PhilRice, I hope to enjoy more of Christ and the church life, especially after retirement, with the fervent hope that together with other overcoming believers, I will also be declared as a good and faithful servant by my Master, the Lord Jesus Christ, on that judgment day when He returns to bring in His millennial kingdom on earth." •

Regalado's routine

"Fear of the Lord is the beginning of wisdom," the 63-year-old scientist swears.

Every day, the first thing he does is to call upon the name of the Lord and seek the word of God - to read and pursue his spiritual nourishment, which he calls "morning revival".

Faces of Agri 4.0

ANNA MARIE F. BAUTISTA

With digital platforms now proliferating, the future in agriculture beams brighter. No wonder, there are people who harness their potentials to solve some of the sector's age-old dilemmas. Get to know some of the forerunners behind the country's journey toward Agri 4.0.



**JOSEPH CARL
DAKILA OLFINDO, 31**

Founder & CEO, Dream Agritech;
Co-Founder & COO, GOEden



**AILON OLIVER
CAPISTRANO, 44**

Lead developer, MOET App

Olfindo of Sta. Cruz, Laguna has managed to build two companies with the sole purpose of providing the latest, relevant technologies and information for the benefit of our farmers who are into small- or large-scale production, and even those who count themselves as 'plantitos' and 'plantitas'.

In 2015, his team launched the Dream Agritech, a consultation outfit where farmers can receive advisories and engage with specialists to help them craft a well-informed farm work plan. They manage their activities offline and online. Olfindo believes that proper farm planning can spare producers from unproductive, inefficient farming systems.

"I am hoping that Dream Agritech will standardize the process of creating a farm plan at the onset of any agricultural venture. By providing expert manpower service, we can address the need for skilled workers in the field. A loftier goal for Dream is to help transform idle lands into productive, well-managed, food-producing parcels," the agri-entrepreneur envisions.

Olfindo co-founded GOEden in 2020, an online e-commerce platform that provides farmers access to a wide variety of agricultural inputs. Just like any online shopping scheme, farmers can order their needs thru the platform and these can be delivered straight to their farm.

Both Dream and GOEden are biblically inspired. His father suggested the word 'dream' because one of Olfindo's first names was after a character in the Old Testament – Joseph the dreamer – who was also the agriculture chief during his time in Egypt. He was able to secure the food of the nation even during the great famine. This is a dream that Olfindo and his team want to realize in these modern times. GOEden was inspired by the Garden of Eden – a place where everything needed to sustain human life is present.

Capistrano envisions precision agriculture to reach the Philippine rice fields. For him, the best way to go is to maximize the use of smartphones.

He was a researcher at DA-PhilRice Negros in 2011 when he thought of complementing the Minus-One Element Technique (MOET) kit with a computer-aided formula to upgrade the fertilizer recommendation component and facilitate their studies on nutrient management. They had limited devices to conduct researches back then.

When he was reassigned at CES in Nueva Ecija, Capistrano was given a chance to hatch the concept through a project grant by DA-Regional Field Office 3.

"The MOET kit has its own guidelines. Cellphones, or Information and Communication Technologies (ICTs) in general, were getting mainstreamed then. I thought I could make use of these for agricultural development, thus the MOET App," the agronomist remembers.

Released in 2015, the MOET App is an android application that can help compute the fertilizer requirements of the rice crop. It can also help predict yields based on a fertilization plan. While advanced, Capistrano believes that the technology will reach the farmers' fields through the help of the agriculture extension workers and the tech-savvy farmers' children.

"It will not only lead towards precision agriculture, but also entice the youth to build a career in this field," he envisions.

Capistrano is pleased to know that the development of the MOET App started the ball rolling at DA-PhilRice in terms of digitizing agriculture. It is the first android application developed in the Institute.

DIGITAL FARMERS PROGRAM



**ANTONIETA
ARCEO, 48**

Project lead, Digital Farmers' Program (DFP)

Arceo posits that if agriculture is to be digitized, the farmers must be prioritized. This has been her team's key motivation as they implement the Program.

DFP is a public-private collaboration between the DA-Agricultural Training Institute (DA-ATI) and the Smart Communications Group. It aims to help bridge the digital divide in the agri-fishery sector.

"Many ICT-related innovations fail to scale up because of the weak uptake by key agriculture players. It is necessary to capacitate first the local sector about these emerging technologies, as we are after digital inclusion," Arceo deems.

Through capacity enhancement activities, DFP farmer-recipients are equipped with the knowledge and skills on digital tools and technologies. Since its launch in 2019, the program has conducted 46 batches of the introductory course – DFP 101 – where farmers are taught how to use smartphones, the internet, social media, and climate and weather applications. Soon, they will start with DFP 102, which is on the use of QR codes, agriculture applications on pest identification and management, online banking, and e-commerce.

Both courses will also be offered under the RCEF-Extension Program where DA-ATI is a major implementer.

"We have people like Tatay Romy, 84, our most senior DFP participant, who affirmed his intentions to learn about these technologies so that he could search for new farming information to improve his livelihood. We hope that there will be more Tatay Romy's in the near future," the chief of DA-ATI's Information Services Division is enthusiastic.

Arceo's satisfaction is rooted on the fact that she is doing something to produce future-ready Filipino farmers. It is close to her heart because after all, she is a farmers' daughter.



**ARTURO
AROCENA, JR. 48**

Lead developer, RCEF-Seed Program Information System

A mandate as huge as the Rice Competitiveness Enhancement Fund (RCEF)-Seed Program required innovations to make seed delivery and distribution more organized. Few months before the program's maiden implementation in September 2019, Arocena and his team at DA-PhilRice proved that the information system (IS) is a worthy platform to support the program.

The RCEF-Seed IS they developed monitors the program's delivery and distribution activities. It is also a portal that can provide timely information for a more responsive planning and implementation.

"The development phase was a challenge for us because we were only given three months to conceptualize, produce, and deploy the system. Good thing, my involvement in previous projects boosted my morale and made me believe that a nationwide rice seed distribution monitoring system is achievable. Besides, I got a reliable team to work with," Arocena shares credit with his colleagues.

Attached within the system are mobile applications such as the RCEF Seed Monitoring System (RCEF-SMS) that facilitates supply commitments, delivery volume, seed varieties, and inspection; the RCEF Distribution App that records the regular seed distribution and farmers' information, and the RCEF E-Binhi, which also records actual distribution, though solely used for the Binhi e-Padala (a seed distribution scheme that uses claim codes; also introduced under the RCEF-Seed Program).

Receiving favorable feedbacks from the implementers, LGUs, and seed growers as the main users of the apps, Arocena is elated that other government programs are considering to integrate something similar to the RCEF IS in their operations.

"I'm in high hopes that this will not end in RCEF, but will eventually expand as a convergence system for other agriculture programs, crops and fisheries alike," the IT graduate and expert aspires.





**JONAS
DEL ROSARIO, 41**
Proprietor, DR1
FarmTech Services

A degree in economics and a number of units in Law did not hinder del Rosario from pursuing his passion. He may have been raised in the urban areas but his heart and mind always wandered along the bounds of their farm in Quezon, Nueva Ecija. He did not only embrace farming but also made sure he would make rice production convenient for other farmers through mechanization.

In 2018, he established the Quezon, Nueva Ecija-based DR1 FarmTech Services, the first Kubota-certified Rice Seedling Center in the Philippines. It offers rice seedlings in mats that were grown through automatic seeders. These are intended for farmer cooperatives and associations that have mechanical transplanters, including the beneficiaries of the RCEF-Mechanization Program and other farm machine service providers.

They also have a rice transplanting package for farmers who want to enjoy the conveniences of mechanical transplanting. It bundles the supply and delivery of mechanically grown certified seedlings, transplanter service, and personnel compliment and their meals.

"Through this initiative, farmers now have a ready source of healthy and high-quality rice seedlings that are a perfect match for mechanical transplanters. We aim for convenience at acceptable cost. As much as possible, we want the farmers to just relax as they see their rice fields being planted mechanically," del Rosario points out.

Del Rosario is determined to expand their operations so that they can include all other crop production activities.

"There are hurdles and challenges that our fellow farmers have to face such as climate change, increased market competition, and shortage of workers. Farmers have to mechanize now so they can work efficiently and enhance their productivity. Embracing the latest technology and using modern machinery paves the way to attaining higher and better yields," he asserts.



**NEHEMIAH
CABALLONG, 29**
Lead researcher,
Ricelytics Project

The agriculture sector is data-rich. A quick search in print or in web could give people access to a wide range of information. The hassle is, there needs much digging in before getting a handful of usable material. For Caballong, the dilemma could actually be answered through a digital platform.

"Ricelytics can provide the need for comprehensive, readily available, accessible, and up-to-date baseline and forecast insights that can be used to craft well-informed programs and interventions for the rice sector," he explains.

Early on, the 29-year-old PhilRice information technologist also co-developed some of today's new rice agriculture-related smartphone applications, which are all downloadable in the Google Play store and can be used offline.

The AgRiDOC app allows farmers to plan and record their farm tasks, receive alerts on crop insights, view farm satellite images, and review crop management practices from the *PalayCheck* System. The *Binhing Palay* App is a catalog of released rice varieties. The *eDamuhan* App uses artificial intelligence to identify weeds in the ricefield and provide management practices thereafter. Caballong's team is still improving the recognition feature of this app.

"I never knew that I would apply my specialization to agriculture. However, I saw the great opportunity that IT can contribute in agriculture. I would like to keep developing solutions for governance," the researcher yearns. No wonder, his earlier works focused on tools and applications for rice field operations, such as smartphone apps, drone technology, Internet of Things, and farming robotics.



Be inspired, GET INNOVATIVE

JULIANNE A. SUAREZ

It all started with a single idea.

Edell Ratcho, a rice farmer from Guimba, Nueva Ecija, just came home from a Rice Competitiveness Enhancement Fund (RCEF) Farmer Field School (FFS) at Myriad Farm School in the same town.

In one of their hands-on lessons, they were taught how to plant using the drum seeder, a machine designed to help farmers do direct seeding more efficiently.

"During one of our classes, I saw how a drum seeder is used and that ignited me into thinking. I was amazed because I realized I can reduce my production cost if I used this machine. I could remove the labor cost because I no longer have to hire somebody for weeding and direct seeding. With a drum seeder, all you have to do is to pull it on your field and your work is done," Edell felt gratified.

Seeing in the FFS how efficient the machine was, Edell looked up online where he could buy it. When he saw the price, he realized it doesn't come too cheap.

But that didn't stop Edell. As someone who loves to innovate and build things on his own, Edell came up with a persistent and brilliant idea. And that is to fabricate his own drum seeder.

"I thought to myself, This isn't so hard to make. I saw how it operates so I know I can assemble a replica of this," he said.

Edell's drum seeder is largely made from scrap materials. The wheels are upcycled from an old mountain bike while the irons were salvaged from a junk shop.

"I spent less than P2,000 for this implement. Most of the materials were upcycled and only the PVC pipe was brand new," Edell said with pride in his eyes.

For him, a drum seeder will ease his efforts in rice planting because aside from being cost-efficient, portable and lightweight, it makes straight seeding rows, and reduces the seeding rate.

Here's how Edell put together his drum seeder:

1. Gather the materials.

You will need an 8-inch-diameter PVC pipe for the seed cylinder, old bicycle wheels for the ground wheels, and iron bars for the handle and shaft;

2. Measure the distance of the holes on the seed cylinder.

From the FFS lectures, Edell learned that the spacing between rows should be 20 cm. He also ascertained that each seed cylinder be 26-cm-long.

3. Divide the PVC pipe.

After ensuring correct measurements, Edell divided the whole pipe into 10 portions. To calibrate seeding rate, he made an outer sleeve to cover the holes.

4. Attach the handle and shaft.

Edell then welded the iron pieces together. He made sure that the whole drum seeder is strong and sturdy to keep the rows straight and avoid slip.

According to Edell, the best features of a drum seeder are its cost-reducing design and efficiency. One bag of 40-kg seeds is enough for a 1.5-ha rice field. Seeds are also planted in straight rows making it possible to use mechanical weeder later.

What started as a raw idea now makes rice farming more efficient for Edell.



Edell Ratcho, whose passions include crafting agricultural machines of his own, shows his self-fabricated drum seeder.



The plant
and the
seed:

A pre-pandemic tale of two farmers

MARY GRACE M. NIDOY

In the outskirts of Santiago, Gerona, Tarlac, a community is nestled in the middle of an agricultural land. Here, families know each other. After all, they are related by blood.

By early afternoon, many of the relatives gather under a massive mango tree where *halo-halo* is being sold to beat the April heat. It resembles an opening sequence of a local movie – children at play, the huddle of parents and adults, and the heat stroke-threatening solar burst.

On a crude wooden bench sits Marjary Macadangdang, an 18-year-old college student. It has been two months since the last time she came home, she tells me.

Her father Jerry, with the noticeable crevices on his forehead, is happy to see her. If not for the scheduled interview, it would take another month before Marjary gets to reunite with her family.

“I did not have a cellphone. Even if I had one, I wouldn’t know how to use it or which buttons to press.” - Jerry

“Being children of farmers like us, we play a big role in terms of helping our parents make full use of the available technologies we have today.” - Marjary

Like many parents in the provinces, Jerry is proud of what his daughter has achieved. When Marjary graduates from college, she would be the first in the family to do so.

“In her high school days, she joined a quiz bee competition in crop production and placed second,” Jerry announces.

“I was actually the champion,” Marjary corrects her father in jest. The two burst in laughter.

The clarification is not something that irritates Jerry. He knows that Marjary means no disrespect. The soft-spoken eldest daughter always says things to her father with a solid sense of love and tenderness.

Trust buttressed their bond when the two became part of the Infomediary Campaign in 2018, PhilRice’s initiative to enhance youth engagement in agriculture.

“Back then, we introduced the high school students to information and communications technology (ICT) tools and platforms so they could help their farmer-parents access information from ICT-based sources,” recalls Dr. Jaime Manalo, project lead.

The PhilRice Text Center (PTC) platform caters to all queries on rice farming from its registered clients.

“The main aim really was to work with the students because we already knew that farmers were having ICT anxiety based on my and other colleagues’ research in 2010,” Manalo elaborates.

ICT anxiety is the feeling of discomfort when using an ICT gadget like a mobile phone.

The plant

Jerry remembers having been in a meeting with his fellow farmer-parents at Corazon C. Aquino High School in Gerona, one of the project sites of the campaign that operated in more than 200 secondary schools. The

teachers taught their students strategies on climate change mitigation and adaptation such as the components under the *Palayamanan* farming system.

“I never had formal training on rice farming. All the things that I do were passed on by our ancestors,” he discloses.

Jerry, as one of the main stakeholders of the project, was introduced to PTC expecting him to adopt the said platform to help him make informed decisions on his farm.

That’s not what happened.

“For one, I did not have a cellphone. Even if I had one, I wouldn’t know how to use it or which buttons to press,” the 51-year-old confesses his anxiety.

Mobile phones, back in the days when Jerry started farming, were rare. When asked about his phone number, Jerry usually gives Marjary’s contact details. Until today, he has never owned a mobile phone.

He also received a Leaf Color Chart but he forgot how to use it blaming how the training gave too much information and his age couldn’t keep up with all the details they unloaded to him.

“It is good that my daughter was there. At her age, she can absorb and digest all the instructions,” Jerry is thankful.

The seed

Marjary, then a Grade 10 student, was taking a crop production subject when she became part of the project.

“I felt sad because the PTC is intended for my father and yet he couldn’t access it,” she regrets.

Adept in using gadgets, she registered to PTC using her phone so she could help her father on pest management and what suitable varieties to plant in their area. This

helped the father-and-daughter tandem improve their farm practices and yield. With the fusion of two generations, it is not surprising that there’s a push-and-pull of ideas when Jerry and Marjary discuss the rigors of rice farming in the household.

“My father wanted to irrigate right away but I told him we needed to follow the instructions in using the observation well,” the obedient daughter recalls.

Among the things she will never forget because of the project is when she and her father attended the *Lakbay Palay* for students at DA-PhilRice CES. Both were amazed to witness the use of the combine harvester and drone sprayer in the field.

“Being children of farmers like us, we play a big role in terms of helping our parents make full use of the available technologies we have today,” she ponders.

Marjary likened herself to a seed.

“When we are planted, we will grow to be the next generation of farmers who will continue what our parents started,” she synthesizes.

Today, she is taking BS Agriculture at Tarlac Agricultural University in Camiling, some 2 hours away from home by public transport. She admits she was inspired by her parents’ hard work in the fields. In fact, what she’s been learning in school such as integrated pest management and other technologies are some of things she already heard about through the Infomediary Campaign. She has also kept all the knowledge products the project gave her.

“It feels like I enrolled in advance classes,” she says in jest.

A different kind of harvest

The first published Infomediary book characterizes Marjary as one of those identified by the project as “Grade A” students.

“They have high credibility and convincing power to influence their parents in terms of decision-making,” Manalo qualifies.

Marjary does not suffer from ICT anxiety like her parents. Providentially, the syndrome isn’t inherited. She wants to be there every step of the way as she orients them of the new technologies she learns in school.

“I draw strength from my parents each time I come home. One day, all the sacrifices will be worth it,” she paused and held back her tears.

Certainly, in the future, Marjary will get a happy ending she and her family rightfully deserve. ●

Three women farmers in Currimao, Ilocos Norte retell their stories of separation, hard work, and triumph with DA-PhilRice Batac. They were the Institute's farmer-partners in implementing the *Palayamanan* and the JICA Technical Cooperation Projects (TCP) 3 a couple of decades or so ago.

Palayamanan is a diversified integrated rice-based farming system that aimed to maximize the use of resources, reduce farming risks, enhance sustainability, productivity and profitability, and improve economic stability, food security, and hopefully better relationship among members of a farm family. Meanwhile, the Japan International Cooperation Agency's (JICA) - PhilRice TCP 3 aimed to develop and promote location-specific integrated high-yielding rice and rice-based technologies.

"Farmers in Currimao are receptive to new technologies. They are PhilRice fanatics, too. Hence, we continuously welcome projects from DA-PhilRice for our farmers," said Ericson B. Biag, municipal agriculturist of Currimao.

Reminiscing partnerships with farmers

HANAH HAZEL MAVI B. MANALO

Teresita I. Allado, 66

Former Chair, Municipal Agriculture and Fishery Council

"I had been growing rice, corn, and vegetables. I was looking for technologies to improve my yield. So when DA-PhilRice Batac tapped me as a farmer-cooperator in 2001, I did not hesitate," she vividly recalled.

Bringing the technologies that she learned from the Farmer Field School (FFS) to her own farm was not easy. She lamented her fight with her husband. He didn't believe in the technologies and practices being taught in their FFS so she decided to have their farms managed separately. This 'separation' lasted for 15 years. Her husband eventually gave up upon seeing his wife's farm repeatedly outperforming his field.

Teresita shared some of the practices she learned from their FFS. She emphasized the importance of the right kind, amount, and timing of fertilizer application. She also recognized the advantage of using high-quality seeds. She realized the value of record-keeping, as well.

"I owe my success to DA-PhilRice. It changed my life for the better," she smiled.

"If not for DA-PhilRice sharing their technologies and practices coupled with my values of perseverance, patience, and hard work, we could still be living in a nipa hut until today. I couldn't send my children to school. I wouldn't have the opportunity to travel to different parts of the country for free. I wouldn't be tapped as a resource speaker in agri-related convocations. I wouldn't be a recipient of various awards. I wouldn't be a local farmer-technician and the Municipal Agriculture and Fishery Council chair," she proudly and gratefully enumerated.

"I was once a mere PhilRice cooperator but for almost two decades, I can now feel that I am one of PhilRice's family members," Teresita confided with teary eyes.



ANGELIKO L. SEVILLA



ANGELIKO L. SEVILLA

Agnes M. Asuncion, 61

Integrated farmer and entrepreneur

"I was an overseas Filipino worker in Hongkong for 22 years. When I got back here, I was just bored so I joined my husband in attending the FFS. It didn't dawn on me that I would become a farmer," she said with a smile, shaking her head.

While joining the FFS, she observed the lady staff of DA-PhilRice Batac working in the field together with the Japanese experts and she rebuked herself, "If these women can, why can't I?" She was inspired by their dedication so she completely embraced the noble profession of farming.

"There's no training that is comparable with JICA-PhilRice. I followed every lesson they taught us," she said.

And, the best learning she could share from participating in the

project was the concept of intercropping to optimize a small area for the whole year, and the habit of showing tender loving care (TLC) in growing crops. Until now, she applies TLC and practices intercropping by planting rice in between the row of posts of dragon fruit plants.

She also shared that it is through a PhilRice activity where she learned about how to grow "dragons".

"Thanks to farming! I was able to send my two children to school. I have a teacher and an entrepreneur. I could easily provide what is needed in my farm and in making dragon fruit-based products," she said with a brimming smile.

Now, she makes a good income from growing dragon fruit plants and producing wine, oil, and soap from the said fruits. Who says money couldn't grow on prickly plants?

Margarita G. Allado, 59

Chair, Local Committee on Agriculture

"I was invited by DA-PhilRice Batac to a meeting to participate in its *Palayamanan* project. I couldn't hide my willingness to join. I awfully wanted to equip myself with new techniques or technologies," she admitted.

Among the new things taught to them that caught her interest was the use of plastic trays in vegetable seedling production. The use of only a bag of rice seeds for a hectare was also new to her as she used to sow three bags of seeds.

Farming has providentially brought her far. It all started with the new knowledge she learned from the project. Now, she has a concrete 2-floor house. She has an accountant, an electrical engineer, and a medical technologist. She has an agrisupply shop. She buys and sells rice. She is into swine and fish production, too. She also serves as a local official in



ANGELIKO L. SEVILLA

their place and leads the committee on agriculture.

"Other people would often ask me why do I still work in the farm if I am now enjoying a good life? I tell them that I cannot abandon farming because this brought me where I am now. I will never be ashamed of being a farmer," she said with a smile.

She dreamt of a good life for her family so she worked hard for it. She doesn't waste her time in gossiping. She only spends her time in farming and is preoccupied looking for business opportunities out of it.

"The good life that I have, I owe it to God. That's why I also share my blessings to others especially to my fellow farmers," she said humbly. Amen. •



Riza G. Abilgos-Ramos

51, Daet, Camarines Norte

*Supervising Science Research Specialist
Rice Chemistry and Food Science Division
(RCFSD)*

ACADEMIC PROFILE:

*PhD in Plant Science and Analytical
Biosciences, University of Nottingham,
United Kingdom, 2010*

MS in Applied Nutrition, UP Los Baños, 1996

*BS in Nutrition, 3rd Place in Nutritionist-
Dietitian Licensure Examination,
UP Los Baños, 1991*

Specializing in nutrition and health researches, she has more than 20 publications, some of which were presented in national and international conferences and symposia. She proves to be more than deserving of her recent in-house *Most Number of Publications and Partnerships Award*.

She has also secured partnerships with various government agencies such as the Central Bicol State University of Agriculture to collaborate extensively on rice R&D; Dr. Paulino J. Garcia Memorial Research and Medical Center research agenda on nutrition, functional foods, and supplements; and Visayas State University for the project, *Exploratory Market Studies of Functional Rice-Based Fermented Products*.

She has initiated internal nutrition R&D projects, conceptualized and led projects on nutrition, health, and wellness potential of the Philippine rice,

rice by-products, and rice-based crops. She also pioneered market-driven product research while protecting the IPs generated and making rice-based product development studies and activities consumer-centric for impact and sure transfer of technology to intended users.

Today, Ramos is one of PhilRice's award-winning researchers and has received national and international recognitions such as 2014 Distinguished UPLB Alumna, Outstanding Official during the 2015 Dangal ng PhilRice, National Finalist in the 2016 Gawad Saka Outstanding Agricultural Researcher, and 2020 Winner for the Philippines in the Gourmand World Cookbook Awards in Madrid, Spain.

Her husband Joel is one of the Institute's senior agri-engineers. Currently, she is the assistant division head of RCFSD. ●



Xavier Greg I. Caguiat

36, Zamboanga City

*Senior Science Research Specialist
Genetic Resources Division (GRD)*

ACADEMIC PROFILE:

*MS in Molecular Biology and
Biotechnology minor in Plant Breeding
UP Los Baños, 2012*

*BS in Biology Major in Genetics
UP Los Baños, 2005*

Caguiat has thus far authored and co-authored 17 publications, ISI and non-ISI peer-reviewed papers carried by national and international journals. He has also shared his expertise in

numerous symposia for paper and poster presentations, which qualified him to receive the in-house *Most Number of Publications Award*.

He has also headed the GRD (2015-2016). He was instrumental in the development and approval of the P23M infrastructure project in the new GRD Building and the P7M DA-Biotechnology Program Office project on genetic characterization of pigmented rice accessions; led a Newton Fund-supported project on nutrient rice under the Biotechnology and Biological Sciences Research Council in UK; and helped the government by genotyping over 3,500 materials under the *High Throughput Genotyping Project* supported by the Bill and Melinda Gates Foundation.

He also leads and co-leads the implementation of two Food and Agriculture Organization (FAO)-funded projects. One is financed by the Benefit Sharing Fund under the International Treaty on Plant Genetic Resources for Food and Agriculture, *Co-development and transfer of rice*

and rice technologies with partner-countries Indonesia, Laos, and Malaysia Project. This pioneers regional exchange of germplasm and other important rice technologies, which could serve as model project in other regional cooperations in the world that will benefit farmers and indigenous communities. The other project is supported under the FAO-Global Environment Facility, *Dynamic conservation and sustainable use of agrobiodiversity in traditional landscape of the Philippines* that initiates the empowerment of IP communities and promotes a sense of ownership of their traditional rice varieties through the establishment of community seedbanks in the recipient villages.

He is the current assistant division head of GRD with research involvement as project/study leader, and co-worker on various genebank activities such as the evaluation of rice accessions against biotic, abiotic stresses, and grain quality profile. He is also an aspiring baker and lawn tennis aficionado. He is married to PhilRice plant breeder, Joanne Domingo-Caguiat, with whom he has two beautiful girls Edra Xavienne and Aury Xavienne. ●

VOX POP

What kind of digital agri-technology do you wish to be invented/developed?

.....
COMPILED BY: MERVALYN O. TOMAS



GE CLAVERIA, 41,
OFW/Farm owner, Nueva Ecija

I hope a digital mapping app for underground water source will be developed where a farmer can find information on the depth and amount of water supply in a specific location. This is important for farmers who want to put up a shallow or deep well in their fields situated in rainfed areas.



RYAN ANTHONY, 40,
Farmer, Cagayan Valley

I would like a fast soil analysis app and machine to be invented so I would easily know what kind of fertilizer is needed for my field's soil.



RANDY BUTUHAN, 38,
Farm Supervisor, Bulacan

We need a mobile app that recommends appropriate pesticides that are available in local markets.



APRIL JOY PINEDA DEPAMAYLO, 41,
Agricultural Technologist/ Farmer, Iloilo

I wish a mobile app that identifies and generates information about pests and diseases affecting a rice plant by just taking a picture of the damaged or affected part will be developed.



ANGELO CADUGO, 22,
Farmer, South Cotabato

I hope a fertilizer app that identifies nutrient deficiency in rice plants will be invented. This is connected to a machine that automatically applies the recommended fertilizer based on the app's test.



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Samar Satellite Station, UEP Campus, Catarman, 6400 Northern Samar • Mobile: 0948-754-5994; 0921-555-5500
Zamboanga Satellite Station, WMSU Campus, San Ramon, 7000 Zamboanga City • Mobile: 0910-645-9323; 0975-526-0306

DA-PhilRice Field Office, CMU Campus, Maramag, 8714 Bukidnon; Mobile: 0916-367-6086; 0909-822-9813
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