PhilRice Magazine

A quarterly publication
of the Department of Agriculture–
Philippine Rice Research Institute

RICE TO THE NEXT LEVEL

ISSN 0254-6132
VOL. 34 NO. 3
JUL-SEP 2021

ABOUT THE COVER

The UN launched the first Food Systems Summit as a call for a global transformation in food systems. World leaders deem the current food systems as unresponsive to overcoming hunger, unhealthy, and destructive to the environment. Amidst these challenges, transformations are currently edging on the fields with diverse crops, cultivated in a safe fashion and sold in a fair market by farmers who were organized and supported through government interventions. As in digital transformation, it may also be said that the only wrong move in food system transformation is not to make any move at all.

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DIRECTOR'S NOTE

Co-transforming the Rice Food System

John C. de Leon
Executive Director

The concept of food systems is not new. A food systems approach "is a way of thinking and doing that considers the food system in its totality." Global food challenges analysis in the 1990s had argued for systems-based approaches. Added focus on feedback between environmental change and food security redeveloped the concept, and interest in food systems governance did not wane.

Food system encompasses the entire range of actors and drivers and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption, and disposal of food products that originate from agriculture or forestry and parts of the natural environments in which they are embedded. It is composed of sub-systems like farming system or input supply system that interacts with other key systems, e.g., for trade, health, and energy (FAO, 2018). The National Academy of Science and Technology (NAST) looks at food system as a circular chain of products, processes, and services involved in delivering nourishing food to the consumers.

The structure of the food system is dynamic, defined in part by global, national, regional, or local boundaries as well as by rural or urban contexts. It is driven by complex and wide-ranging trends and elements (e.g., the food system wheel framework; food system maps) and generates incentives for interdependent players that impact each other. Thus, a structural change in the food system might originate from a change in another system causing a significant impact on it. The overall performance of the food system, measured in terms of sustainability, is therefore "the result of the intertwined conduct of all the actors and drivers in the system".

A sustainable food system is understood to "deliver food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised." Such system also entails normative aspects and advances the notion of transformation through more holistic and coordinated management of its physical and functional dimensions. In this regard, the UN Food Systems Summit embraces the so-called five Action Tracks to capture key opportunities and complex challenges of food systems and relate them to one or more food systems components.

The historical context of the Philippine food system shows a dominant discourse or orientation toward staples, key cash crops, high productivity, and international markets (in F. Davila 2018, Human Ecology Review). Traditional programs to address food and nutrition security challenges have focused on maximizing production of specific commodities. Integrative approaches, like value chain or market systems development, examine more the way value is created and intervention is captured – not only by producers but also by other stakeholders to improve the chain's performance. The latter recognizes markets as complex adaptive systems and linkages that can affect multiple value chains.

Over the years, DA-PhilRice has pursued and instituted projects, programs, and campaigns that looked at rice beyond the hackneyed view of monocrop production. Its pioneering Planting and Fertilizer Management program in the 1990s already aimed to improve and sustain the productivity of soils planted to rice. Researchers from our Agronomy and Soils Division have also reported as early as 1995 about their work on methane emission from an irrigated rice field. Our engineers and agronomists have similarly added to the body of knowledge on the alternate wetting and drying irrigation technique and direct seeding method of crop establishment to reduce greenhouse gas release to the atmosphere. Our *Palayamanan* project has evolved rice growing in combination with high-value crops, mushroom production, fish and livestock rearing (including dairy carabao), among other components, into encouraging our farmers and their families to diversify their food, nutrition and income sources.

Our Be RICEponsible campaign advocated the curbing of wasting rice while also promoting the consumption of rice mixed with other staples as well as brown rice. Our Healthier Rice Project with IRRI aims to develop and deploy biofortified rice products to help address micronutrient deficiencies. Our plant breeders continue developing climate-smart varieties, while researchers from our Socioeconomics Division recently published their analysis of the local rice value chain. Our Development Sector has used the Farmer Field School and other experiential approaches to reinforce observation and learning among our farmers, agricultural extension workers, and even farm school operator-trainees on context-specific challenges of rice farming at the local level, which can enrich the sustainable transformation narrative on food systems. They have also championed the development of rice and rice-based enterprises from production to processing to marketing through our Rice Business Innovations System Communities.

We can add more to the list. Suffice it to say that feeding our country sustainably, or even the world, necessitates balancing complex social, economic, and environmental concerns. It is worth noting then that the UN Food Systems Summit this September is "about changing food systems to make them healthier, more sustainable and equitable." We are thrilled to be part of the Philippine dialogue, and help co-transform the rice food system for the better. ▪

ADONIS BUHAYAN, DA-AFID

Secretary William Dar (C, foreground) opened the two-day National Food Systems Dialogue, July 13. Also present during the opening were: UN Resident Coordinator in PH Gustavo Gonzalez, National Nutrition Council Executive Director Azucena Dayanghirang, DA USec for Agri-industrialization and Fisheries Cheryl Marie Natividad-Caballero, DA USec for Planning, Policy, and Research Fermin Adriano, Founding Farmer and CEO/ President of AGREA Agricultural Systems International, Inc. Cherrie Atilano, Assistant Food and Agriculture Organization (FAO) Representative for Programme FAO PH Tamara Palis-Duran, and DA Asst. Secretary for Regulations and Philippine Council for Agriculture and Fisheries Executive Director Liza Battad.

Agri chief aspires for sustainable food systems

Agriculture Secretary and UN Food Security Systems national convenor, Dr. William D. Dar, has urged the public and private sectors to partner with his Department in achieving sustainable food systems in the country.

"Beyond food production, food systems also comprise processing, distribution, preparation, consumption, the market and institutional networks for governance, and the socio-economic and environmental outcomes of these activities," he said in his speech during the National Food Systems Dialogue, July 13-14.

He explained that to achieve sustainable food systems, it requires synergy among relevant national government agencies, local government units (LGUs), key stakeholders, academe, and the private sector to transform food systems to be responsive to the 2030 Sustainable Development Goals.

Dar acknowledged that building partnerships is not easy because of conflicts of interest, colliding ideologies, and immiscible cultural norms, but it is possible.

"Even with the pandemic as a morbid pretext, the agriculture sector witnessed the coming together of stakeholders against hunger. The DA formed multiple partnerships with other national agencies for programs under our pandemic recovery program, Plant, Plant, Plant," he said.

He cited partnerships with the Departments of the Interior and Local Government and Transportation, which helped mobilize farmers' produce amid border closures.

The secretary added that private sector players joined in the Department's *Kadiwa ni Ani at Kita* program that directly procures food from farmers and sells the produce at affordable prices.

He also recognized the Department of Trade and Industry's help in holding down pork prices at the height of the African Swine Fever outbreak.

With more partnerships, Dar is looking ahead to significant accomplishments.

"We wish to highlight, for instance, [that] continued partnerships with the LGUs [will result] in the establishment of food markets in their respective areas; properly supported by needed cold storage facilities and logistics system that includes reefer vans to reduce postharvest losses and food wastage," he said.

"With the implementation of the Mandanas-Garcia ruling next year, we [also] wish to see the LGUs becoming the real "food security czars." They should now actively boost their respective agri-fishery sector, and we at DA will remain as their guide and provider of needed technical support," he said.

He also highlighted the contributions of other government agencies to eradicate hunger and address malnutrition by 2030.

"Our food system should be able to adapt to climate change, in as much as it should weather external shocks like the COVID-19 pandemic. The overall goal is to reconcile the need for meeting the demands of the growing population, [while] restoring the environment and improving the quality of our natural resources," he explained.

Dar will present the insights and suggestions from the National Dialogue in the UN Food Systems Summit in September. ▪

MERVALYN O. TOMAS

DA-PhilRice esteemed for its RCEF efforts

Public officials and farmers have commended DA-PhilRice for leading the Rice Competitiveness Enhancement Fund (RCEF)-Seed Program and co-implementing the RCEF-Extension Program.

In her opening statement during the Program's Midyear Review and Assessment on Aug. 4-6, Sen. Cynthia Villar said the Institute has done what is essential in serving the rice farmers.

"PhilRice was able to deliver high-quality inbred rice seeds, conduct extension work, and innovate its approaches despite the pandemic. It takes a lot of sacrifices especially because the cropping calendar is fixed and the communities that need to be reached have quarantine issues. Still, you were able to evolve and respond well to your mandate under the Rice Tariffication Law," the chair of the Senate Committee on Agriculture and Food said.

Records show that the RCEF-Seed Program has distributed 6.5 million bags of inbred certified seeds to over 1.2 million rice farmers after four planting seasons of implementation.

Seed distribution activities have served 57 provinces covering 956 cities and municipalities in the first three planting seasons, and 42 provinces covering 722 cities/municipalities in the 2021 wet season.

Villar also lauded DA-PhilRice's effort in introducing the digital voucher system called *Binhi e-Padala*, which was found to shorten queueing time of farmers in getting the seeds, improve the program's logistics, and facilitate next-day payment to seed growers' cooperatives.

Based on the Institute's Socioeconomics Division monitoring and evaluation survey conducted among RCEF seed beneficiaries, the yield of respondents significantly grew from 3.62t/ha in the 2019 dry season (DS) to 4.17t/ha this 2021 DS.

Under RCEF-Extension, Villar also recognized the Institute's effort in disseminating information on cost-reducing and yield-enhancing technologies and practices through online and onsite training activities, IEC materials, and other communication platforms.

From 2019 to 2021, 159 rice specialists and 618 trainers were produced under the DA-PhilRice's RCEF training programs. The new specialists complement the pool of rice experts in a locality. Currently, all regions in the country are already deployed with rice specialists.

Meanwhile, RCEF seed recipients also received technical briefings and various IEC materials.

Based on the same survey, 97% of seed recipients who had access to the communication services said they have applied the knowledge they learned from them.

"This is an example of public service at its best. PhilRice has evolved and responded very well to the needs of the rice industry and the demands of the times. I thank PhilRice for being true to its mandate under RCEF," Villar enunciated.

Christian Ramos, rice coordinator from the DA-Regional Field Office III also said farmers, local government units, and seed growers' cooperatives from Luzon A cluster have good impressions on the RCEF-Seed Program implementation.

Orlando Cruz, one of the RCEF Seed farmer-beneficiaries from Guiguinto, Bulacan said his production increased after using the certified seeds.

"Through the NSIC Rc 436 I received from the program, I harvested 8.4t/ha in a hectare! Now, I'm slowly recovering from my previous losses," Cruz noted. ▪

ANNA MARIE F. BAUTISTA

Farewell, former Undersecretary Edmund Jaramillo Sana

"There is still big money in rice farming" former Undersecretary Edmund Jaramillo Sana was once quoted in one forum he attended.

For four decades, Sana, 71, who succumbed to heart complications in Gonzaga, Cagayan on Aug. 10, had strengthened DA, in various capacities especially as Undersecretary for Operations from 2003 to 2006.

He served as PhilRice consultant after his retirement in 2015. Sana helped improve implementation of PhilRice projects including the Philippine Rice Information System (PRISM) - an information system based on satellite data and ground observations that monitors natural disasters and their impact on rice.

PhilRice will always remember the many ways he has selflessly helped the Institute. ▪

Golden Rice is expected to help improve nutrition status, particularly in reducing vitamin-A deficiency. Currently, DA-PhilRice is mass producing the Golden Rice seeds for commercial propagation.

Filipinos soon to plant and eat Golden Rice

Filipino households are close to benefiting from a vitamin A-infused rice variety with the approval of its commercial propagation permit.

Dr. John C. de Leon, DA-PhilRice executive director, announced that the DA-Bureau of Plant Industry (DA-BPI) issued on July 21 the biosafety permit for propagating Golden Rice.

The permit stipulates that Golden Rice has "undergone satisfactory biosafety assessment pursuant to the Joint Department Circular No.1, Series of 2016 of the Departments of Science and Technology, Agriculture, Environment and Natural Resources, Health, and Interior and Local Government".

De Leon said that apart from meeting the rigorous standards of biosafety regulation, Golden Rice development follows the standard process of rice breeding, which usually takes 10-12 years before a variety reaches the consumers.

This biosafety approval is the first authorization for the commercial propagation of a genetically engineered rice in South and Southeast Asia.

With this permit, De Leon said that Golden Rice can now be planted for commercial production under the terms and conditions specified by DA-BPI.

He clarified though that the National Seed Industry Council has yet to approve the registration of Golden Rice based on consistent good agronomic field performance.

"As always, we are committed to ensuring the highest quality of seed for farmers and a safe and nutritious food supply for all Filipinos," the DA-PhilRice chief stressed. He elaborated that a comprehensive quality assurance and stewardship program that covers all steps in the chain from seed production, to post-harvest processing, to marketing will be implemented.

Golden Rice is part of the Healthier Rice Project carried out by DA-PhilRice in partnership with the International Rice Research Institute (IRRI).

"Rigorous research and regulatory review has demonstrated that Golden Rice is as safe as ordinary rice with the added benefit of beta-carotene in its grains," said IRRI Director General for Research Dr. Ajay Kohli.

"This milestone approval is the product of cross-cutting collaborative work in the agriculture and nutrition sciences, the public sector, and local farming communities, who are all looking forward to seeing Golden Rice reach the tables of those who need it the most."

Golden Rice is being developed for the humanitarian purpose of helping curb vitamin A deficiency (VAD). Hence, De Leon said that the vitamin A-enriched rice will be deployed in partnership with appropriate agencies through market-based and programmatic approaches (e.g., feeding program) in areas where the prevalence of VAD is high.

Studies have shown that a cup of cooked Golden Rice contains enough beta-carotene to meet up to 30-50% of the estimated average requirement of vitamin A for children aged 6 months to 5 years, the group most vulnerable to vitamin A insufficiency in the Philippines. At present, only 2 out of 10 Filipino households meet the estimated average requirement for vitamin A intake in their daily diet.

With its potential to provide a significant amount of vitamin A in the diet, Golden Rice can be an effective complementary approach to achieving the Department of Agriculture's vision of availability, affordability, and accessibility of quality, safe, and nutritious rice for all Filipinos at all times.

Golden Rice has been thoroughly assessed for food safety in Australia, New Zealand, Canada, USA, and the Philippines. ▪ **HEALTHIER RICE PROJECT**

MUNICIPALITY OF TALAVERA FACEBOOK PAGE

Pandemic-hammered families in Nueva Ecija receive free Malasakit Rice.

Nueva Ecija's palay-buying program benefits rice farmers

Farmers are thankful to the provincial government of Nueva Ecija as it continues to buy palay from them through its Palay Price Support Program (PPSP). The program is being implemented by the Provincial Food Council (PFC), which was formed by Gov. Aurelio M. Umali in 2019. DA-PhilRice is a PFC member. Normita Carreon, farmer-beneficiary from Laur, expressed her gratitude because she was able to sell her dry season palay harvest to the PFC at a higher price.

"We asked the provincial government to buy our palay because we heard that their buying price is higher compared to traders," Carreon said.

Umali explained that through the PPSP, the provincial LGU buys fresh or wet palay from the poorest farmers at a higher price considering the production cost and the prevailing farmgate price.

He added that to qualify, a farmer should be at least 18 years old, owns or is directly farming a 3-ha or less farm in Nueva Ecija, and has the capacity to sell palay.

"Farmers who apply for the program are also evaluated by the Provincial Social Welfare and Development Office to prove if they are among the poorest in the province," Umali said.

The governor added that palay bought from farmers are processed by local rice millers they have partnered with.

"Kasapi Micro Finance and Rural Development Inc. is the rice miller for farmers from District 1; Dysico Rice Mill for the second district; and Nueva Ecija Grain Drying Facility owned by the PLGU for the third and fourth districts," he said.

He explained that the ready-to-cook product branded as Malasakit Rice is packed at 25 kg per sack, and is sold to consumers with the help of the Magsasaka partylist. "The Partylist, under the leadership of Rep. Argel Joseph T. Cabatbat, serves as our marketing partner," Umali said.

Magsasaka outlets are put up around Nueva Ecija and other provinces.

Recently, free Malasakit Rice was distributed anew to help families in the province hard-hit by the pandemic. To buy Malasakit Rice and support our local rice farmers, visit Nueva Ecija's Provincial Food Council page: https://bit.ly/3ARjzQM. ▪ **MERVALYN O. TOMAS**

Healthier rice highlighted

As the country celebrated this year's nutrition month in July, DA-PhilRice iterated the importance of consuming nutritious rice.

"Brown rice is nutritionally superior to white or polished rice as it has more fiber, protein, vitamin E, B vitamins (thiamine, riboflavin, niacin), and minerals (iron, magnesium, phosphorus, potassium, manganese, zinc, and selenium)," Dr. Marissa Romero, food scientist, said.

She added that based on clinical studies, regular consumption of whole-grain cereals, including brown rice, may help reduce the risks of diabetes, cardiovascular diseases, and cancer. It may also reduce cholesterol, promote regular bowel movement, and aid in weight control. ▪ **MERVALYN O. TOMAS**

RICE ACROSS THE COUNTRY

COMPILED BY: SARAH JOY N. RUIZ, ALYANA MAE A. TUYAK, JAY-AN P. GONZAGA, JERALD L. BERNADES, AND JONEL D. PADERES

WILBERT JADE M. LORENZO

DA-PHILRICE AGUSAN

Technologies showcased

The station's new study, "TechnoPUSH" promotes farm machines, high-quality seeds (HQS), and farm management recommendations in Surigao del Norte. Select farmer-cooperators tried the walk-behind seeder, five location-specific HQS planting with rice crop manager (RCM), and alternate wetting and drying (AWD) technologies for the first time. Farmers will also be trained on rice seed production to ensure enough supply. ▪ **MARELIE D. TANGOG**

CYNTHIAMAY O. LAPAT

DA-PHILRICE BATAC

Pest and nutrient management taught

The station recently trained 26 rice specialists on pest and nutrient management. Mismanaged pests could incur an estimated annual average loss of 37%. Meanwhile, excessive nutrients will end up causing pest damage, lodging, and soil pollution. Participants were composed of agricultural extension workers, local farmer technicians, farm school owners and workers, and Technical Education and Skills Development Authority staff in Ilocos Norte. The training was under the Rice Competitiveness Enhancement Fund - Rice Extension Services Program (RCEF-RESP). ▪ **DEEJAY JIMENEZ**

MICHAEL L. SATUITO

DA-PHILRICE BICOL

Bicolandia supports WS planting

Local government units in Bicol are again providing RCEF farmer-beneficiaries with certified seeds and knowledge critical in rice production this wet season.

Together with DA-PhilRice Bicol, they distributed print, video, and audio materials containing science-based and field-tested recommendations on seeding rate, land preparation, and pest and nutrient management. PalayCheck, an integrated crop management system for rice, is also included in the materials.

"We lack video materials for our virtual training courses and some of our resources are already outdated. We're glad that these were provided to us. We will show and broadcast these videos and audio materials. We will also circulate the YunPalaYun brochure during seed distribution," said Romela Montesinay, municipal agriculturist of Malilipot, Albay. The brochure contains practices that help reduce production cost and increase yield.

In Donsol, Sorsogon, municipal agriculturist Lindez Espada said that DA-PhilRice's knowledge resources give them confidence in conducting online learning sessions.

This wet season, about 50,000 farmers in Albay, Masbate, and Sorsogon are benefitting from the RCEF Programs. ▪ **MICHAEL L. SATUITO**

DA-PHILRICE ISABELA

Local hybrid rice seed production intensified

To ensure high-quality and enough seeds of hybrid rice, DA-PhilRice has been training seed growers in Region 2 and Cordillera from June until October this year. The trainees, who are expected to lead the production of public hybrid rice seeds in their areas, are learning the principles of hybrid rice seed production. This training initiative complements DA's Hybrid Rice Program. ▪ **JONEL D. PADERES**

MARIA SOFIA M. CANILAO

DA-PHILRICE LOS BAÑOS

Minus-One-Element Technique (MOET) promoted

Farmers in Catanauan and Lopez, Quezon learned more about MOET in a training conducted with the Quezon provincial government unit, July 5-9. MOET is a farmer-friendly and quick soil analysis kit used in diagnosing soil nutrient status including nitrogen, phosphorus, potassium, sulfur, and copper. MOET addresses the high cost of soil chemical tests, inaccessibility of test centers in remote areas, and delay in the release of test results. The training was under RCEF-RESP. ▪
RUBY MOSELLE O. TUMANGIL

ABDULRAUF K. TALIB

DA-PHILRICE MIDSAYAP

Uplanders complete FFS classes

More than 300 upland rice farmers in Maguindanao have completed season-long Farmer Field School (FFS) trainings under the Upland Rice Technology Transfer for the Bangsamoro Project funded by the Japan International Cooperation Agency.

Showcased in the field day were good-performing upland rice varieties including upland and premium Dinorado, Sakilan, Kiraban, Kapucao, and NSIC Rc 27.

The series of FFS graduations and Farmers' Field Days were conducted on June 29 and July 14 in Matanog, July 7-8 in Buldon, and 12-13 in Barira. The trainings were co-implemented by the Ministry of Agriculture, Fisheries, and Agrarian Reform - Bangsamoro Autonomous Region in Muslim Mindanao. ▪
SYLVIA THERESE C. QUIRING

Farmer associations gain more rice knowledge

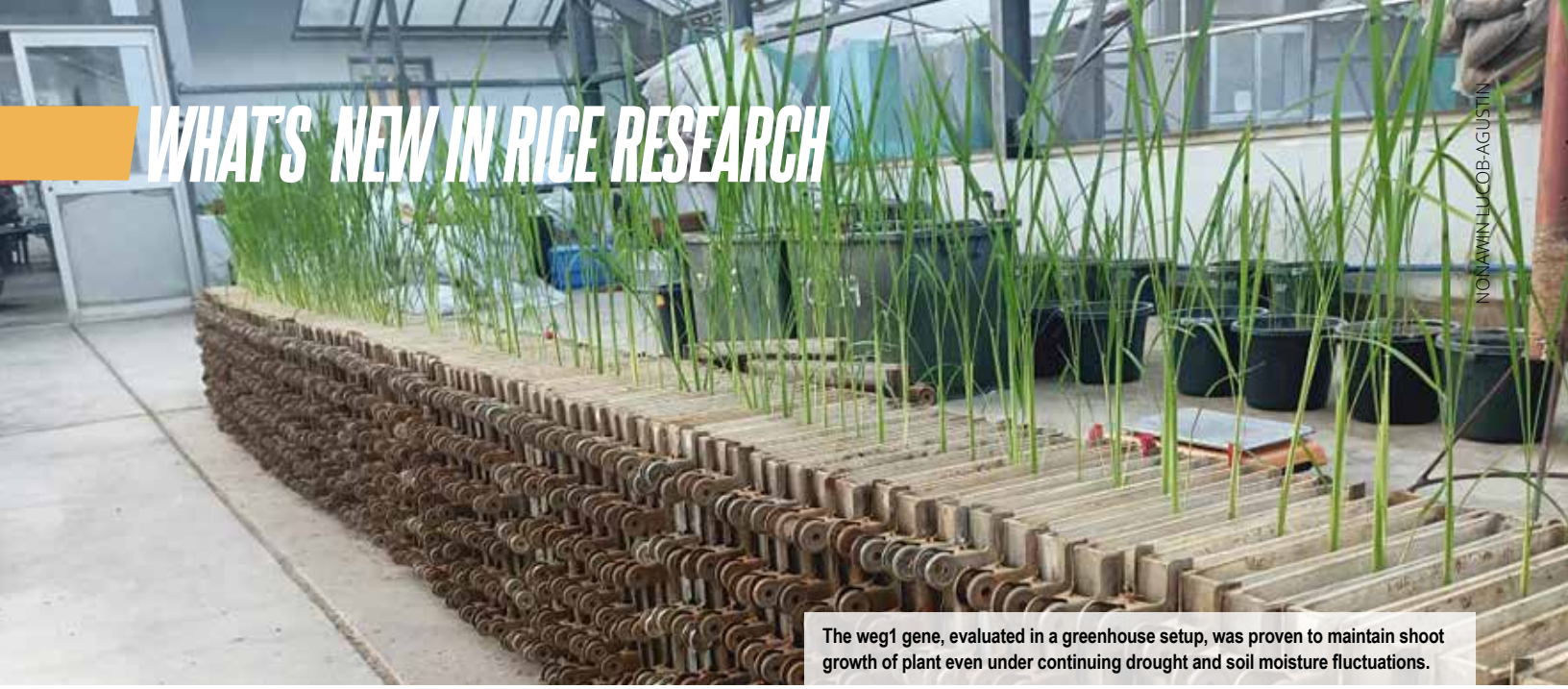
Some 20,000 rice farmers have benefitted from the knowledge products distributed by DA-PhilRice Negros to 65 associations and 19 farm schools in Regions 6 and 7 at the end of the first semester. The products were delivered through the agriculture offices and Technical Education and Skills Development Authority in Aklan, Capiz, Antique, Iloilo, Bohol, and Negros Oriental.

Seven farmer associations have pledged to create a Rice Corner or Rice Info Hub for rice growers to access the materials. Already, certain business owners have agreed to display rice-related posters and reading materials in their stores.

MARIEL M. SAMOLDE

DA-PHILRICE NEGROS

The station's development team aims to set up Rice Info Hubs across the regions by year end. ▪ **VANESSA A. TINGSON**



NONAWIN LUCOB-AGUSTIN

The weg1 gene, evaluated in a greenhouse setup, was proven to maintain shoot growth of plant even under continuing drought and soil moisture fluctuations.

Gene vital for drought resistance in rice discovered

MERVALYN O. TOMAS

A mutation gene that may help rice plants survive despite adverse conditions has been identified by a balik scientist fellow hosted by DA-PhilRice.

Dr. Nonawin Lucob-Agustin, together with other researchers from Nagoya University in Japan, discovered the wavy root elongation growth 1 (weg1) gene, which may help rice cope with drought especially in rainfed lowlands where water is scarce.

The scientist explained that the gene was identified from mutants of a rice variety called Taichung 65. The mutant has wavy parental roots compared to its normal type that has straight parental roots.

"The wavy root is found to be highly branched compared to the straight root. Highly branched root system enables the plant to explore its underground environment for water and nutrients, which may maintain survival and productivity even under drought condition," Lucob-Agustin, who won a 2021 Special Citation Award from the National Academy of Science and Technology, explained.

She said the weg1 mutant produces more L-type lateral roots, which are smaller roots produced from the parental root. Lucob-Agustin said that between the two types of lateral roots — the S-type and L-type, the latter are capable of higher order of branching; thus, "important for the expansion of the entire root system for more absorption of water and nutrients from the soil."

"The mutation gene directly regulates asymmetric cell elongation that causes growth of wavy parental root and indirectly regulates the emergence of highly developed lateral roots," Lucob-Agustin said.

Meanwhile, the researchers found high auxin level accumulation at the outer bent regions (curvatures) of the wavy parental root where L-type lateral roots grow.

"High auxin level likely induces the formation of L-type lateral roots," she said.

Lucob-Agustin further emphasized that this mutation gene has no detrimental effects to shoot and yield, and is responsive to nutrient levels.

"The highly branched roots may also be important in taking in immobile nutrients such as phosphorus," she said.

The weg1 mutation gene also affects only the formation of wavy roots and lateral root, and has no retarding effects on other root components.

"Further evaluation showed that this mutation gene maintains the rice plant's shoot growth under continuing drought and soil moisture fluctuations in Philippine conditions. Hence, it can be a material for rice breeding to improve shoots under water-limited conditions," she explained.

She added that her team is currently developing lines using the weg1 to develop drought-resistant and high-yielding varieties of rice.

Details of this study can be found in this link: https://bit.ly/38oqlkN. You may also watch Dr. Lucob-Agustin's presentation of this research: https://bit.ly/373qUjo.

Golden Rice: a safe and healthy food

CHRISTOPHER C. GONZALES

Golden Rice is the first genetically engineered rice authorized for commercial propagation in South and Southeast Asia.

Rice is a prominent staple food comprising 40% of the Filipino diet and a primary source of carbohydrates that provide energy needed by the body. No other food can truly take the place of rice. The Healthier Rice Project under the DA-PhilRice, in partnership with the International Rice Research Institute (IRRI), develops biofortified rice like Golden Rice as a complementary food-based intervention to offer better access to nutritious food.

Golden Rice is just like your ordinary rice but with added beta-carotene, which is a source of vitamin A and gives the grain its golden color. It complements other dietary sources such as squash, papaya, sweet potato and green leafy vegetables like malunggay.

According to the National Nutrition Council, vitamin A plays an important role in supporting normal bodily functions such as enhancing the immune system, promoting healthy body growth and reproduction, and protecting eye health.

Based on computations, one cup of cooked Golden Rice can provide 30-50% of the estimated average requirement of vitamin A for preschool children, and two cups for school children and adults. With daily intake, it can be a sustainable source of vitamin A. A simulated analysis study suggests that beta carotene-rich Golden Rice could improve vitamin A intake and reduce the prevalence of vitamin A deficiency (VAD) among women and children.

In terms of aroma, texture, and taste, Golden Rice is indistinguishable from its conventional background based on results of initial sensory evaluation.

It is certified to be "as safe as ordinary rice" by the DA-Bureau of Plant Industry, and other food safety institutions in Australia, New Zealand, Canada, and USA. As it is important to eat vegetables rich in beta-carotene, pairing these with Golden Rice won't lead to vitamin A overdose as its beta-carotene will only be converted to vitamin A as much as the body requires.

Not only does it serve as safe food, but also doesn't contribute any harm to the environment as the crop management of Golden Rice does not require any special cultivation practices like the ordinary rice.

With the recent approval of its commercial propagation, Filipinos are one step closer to planting and eating rice rich in vitamin A. DA-PhilRice and IRRI are identifying market and program-based approaches to ensure that Golden Rice reaches target communities at the soonest possible opportunity.

An upcoming product under the Healthier Rice Project is the high-iron-zinc rice, which could provide additional essential micronutrients, such as vitamin A, zinc, and iron to help address deficiencies. ▪

The yellow grains of Golden Rice demonstrate the presence of beta-carotene, which is only available in the leaves and stem of ordinary rice.

PH SUPPORTS THE UN FOOD SYSTEMS SUMMIT

The Philippines, through the Department of Agriculture (DA), with its Regional Field Offices, Bureaus, attached agencies and corporations, joins other member-countries of the UN in pursuing the five action tracks by implementing food security and nutrition initiatives that holistically consider the economic, social, and environmental concerns of the food systems.

To be held in September 2021, the Summit will gather commitments from the UN member-states toward attaining sustainable and equitable food systems in the decades to come.

Below is the preparation of the "OneDA Family" toward the 2030 agenda for sustainable development.

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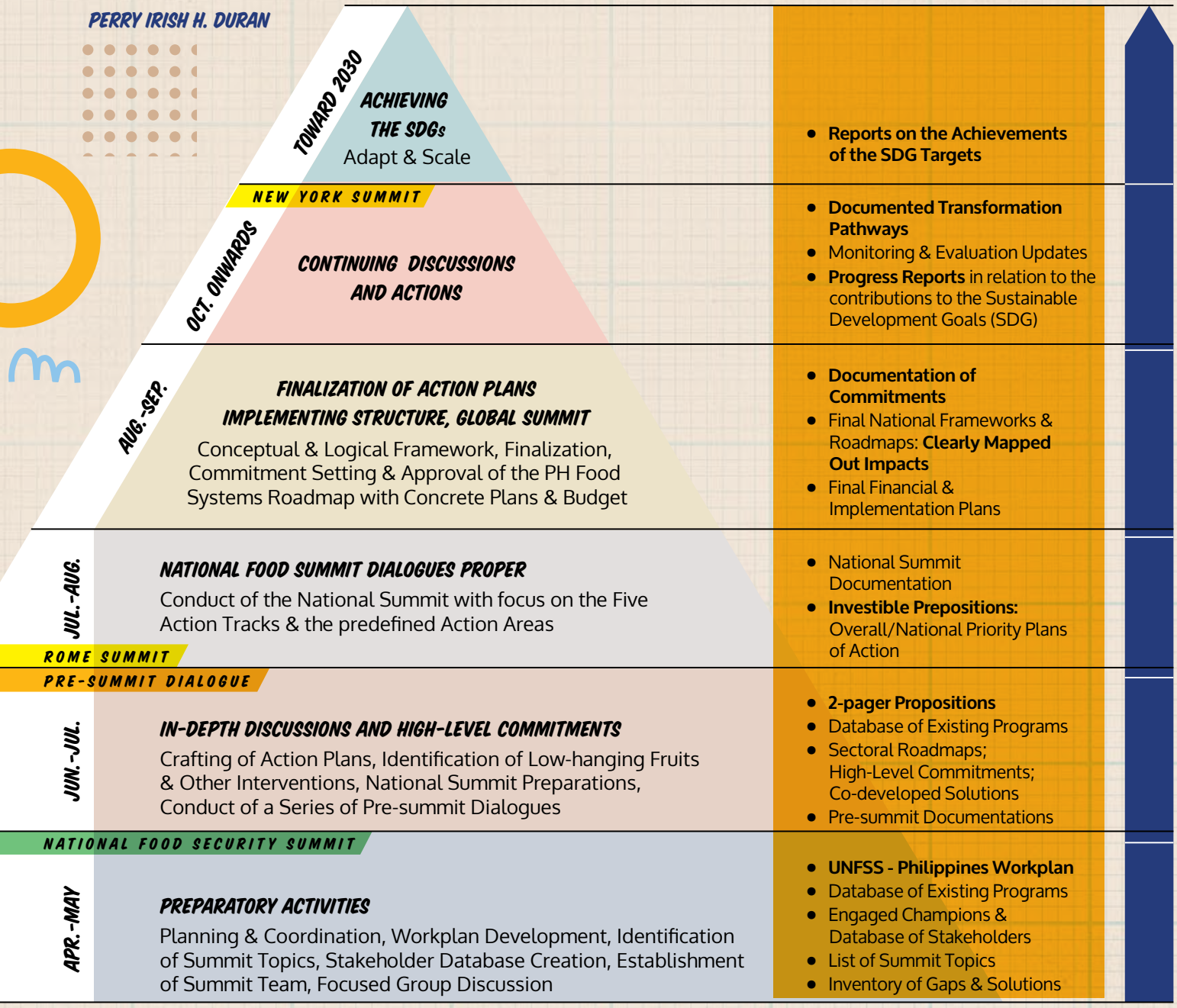


UN'S 5 ACTION TRACKS TO ATTAIN SDGs

1. Ensuring access to safe and nutritious food

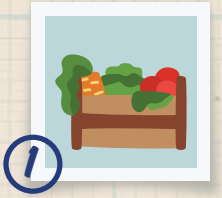
2. Shifting to sustainable consumption patterns

3. Boosting nature-positive production at scale

4. Advancing equitable livelihoods

5. Building resilience to vulnerabilities, shocks, and stresses.

PRIMARY MANDATES OF DA PERTINENT TO FOOD SYSTEMS FRAMEWORK

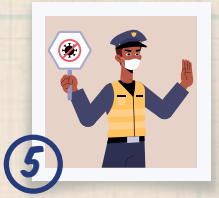


1. Increase farm productivity

2. Guarantee a healthy profit/income for agricultural producers to maintain livelihood

3. Ensure stable supply of food at affordable prices

4. Promoting consumption of nutritious, safe and quality food



5. Preventing entry and spread of animal and plant diseases.

TRANSFORMING PHILIPPINE AGRICULTURE

OneDA REFORM AGENDA: KEY STRATEGIES

STRATEGIC COMMUNICATION

- Bayanihan Agri Clusters
- Collective Action/Cooperatives Development
- Province-led Agriculture & Fisheries Extension Systems
- Mobilization & Empowerment of Partners
- Diversification
- Credit Support

CONSOLIDATION

- Technology & Innovation including Digital Agriculture
- Farm Mechanization & Infrastructure Investments
- Climate Change Adaptation & Mitigation Measures
- Food Safety & Regulations

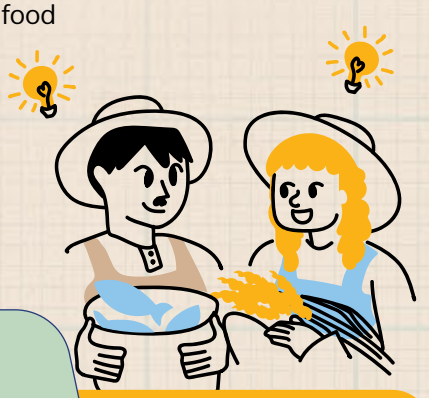
MODERNIZATION

- Agri Industrial Business Corridors
- Global Trade, Export Development & Promotion
- Postharvest, Processing, Logistics & Marketing Support

INDUSTRIALIZATION

- Agriculture Career System
- Education & Training: Agribusiness Management
- Youth & Women Engagement
- Ease of Doing Business & Transparent Procurement

PROFESSIONALIZATION



"A FOOD-SECURE & RESILIENT PHILIPPINES WITH EMPOWERED & PROSPEROUS FARMERS AND FISHERFOLK"

The Philippine food security framework under the present administration aims to attain a viable, resilient, and sustainable food system anchored on the four pillars of the "OneDA Reform Agenda" namely: consolidation, modernization, industrialization, and professionalization.

Q&A

DR. EUFEMIO T. RASCO JR.
Chair, Agricultural Sciences Division
National Academy of Science and Technology

Rice in the Food Systems

HANAH HAZEL MAVI B. MANALO

The United Nations Food Systems Summit aims to make food systems healthier, more sustainable, and equitable toward achieving the Sustainable Development Goals by 2030.

To help us understand food systems, former DA-PhilRice Executive Director Dr. Eufemio T. Rasco Jr., now chair of the agricultural sciences division of the National Academy of Science and Technology (NAST), was interviewed.

What is the food system and the agri-food system?

We need to make a distinction between agriculture and food. Agriculture covers crops, livestock, and aqua products including microbes such as mushrooms and algae. It covers food, feed, as well as non-food industrial raw materials such as cotton, abaca, rubber, and some species of seaweeds. Some species function as food, feed, and industrial raw materials. For example, the rice endosperm is used as food but the rice hull is used as fuel, and rice bran is used as feed or industrial raw material. The rice endosperm is cooked as food after minimal processing (milled for immediate consumption) or further processed into flour and noodles. In this manner, rice is also a raw material for industrial food processing.

To get a more holistic understanding of the challenge and opportunities of feeding society, it is ideal to look at food as a product of a system. The food system is a chain of interconnected materials, products, and services that primarily provide nutrition to consumers but perform equally important services, among which are providing livelihood and environmental stewardship. Materials include production inputs such as seed, fertilizers, machinery, and pesticides. They also include inputs in trading and marketing such as packaging materials. Product from the farmers' viewpoint is the form that is sold; in rice, the main product sold by farmers is *palay*. Direct services in the food system cover production, processing, trading, and waste management. They also include technologies and policies. Ideally, the food system must be circular; materials and energy must be recycled into the system.

What is the role of the rice sector or industry in the food system?

In the Philippines today, the rice industry dominates our farms and tables, and the food system in general. It uses up most of our irrigation water (70-80%), and farm land (at least 25%), labor and capital for farming. Among the poor, rice supplies as much as 80% of the food calories.

How did our rice industry manage to dominate our food system? The answer is true for food grains in general, but among these major grains, rice happens to be the best adapted to our country's tropical conditions. The basic truth is that food grains have the advantage of being easy to mass produce and store, and can also produce a diversity of marketable high-value by-products. This is the main reason why food grains were dominant in food systems throughout history.

Considering the dominant role of the rice industry in our food system today, one cannot avoid associating it with the system's dysfunctionalities. Rice farmers are among the poorest farmers. Rice production exacts very high environmental costs, and rice consumption exacts very high health costs to consumers. These scientific truths are documented in hundreds of peer-reviewed publications.

What is the relationship between rice security and the food system?

It is misleading to equate food security with rice security. Rice is not the only food, and good food requires balance among various components. Considering the negative impacts of the rice industry on the farmers, consumers, and the environment, rice security in the context of present consumption and production trends may actually compromise long-term food security.

However, rice farming in the context of diversified agriculture can contribute substantially to food security. Indeed, the best opportunity for farm diversification in the Philippines is in the rice farms. About 1/3 of the best farm lands are rice farms and about half of these are irrigated with access to good roads, and are distributed throughout the country. In addition, rice farmers enjoy the lion share of government support for agriculture in terms of subsidies and grants. Among these are free irrigation, machines, fertilizers, and seeds.

The only factor lacking to make diversification happen in the scale needed to make an impact is a policy that a substantial (in contrast with the current token) part of this government support for the rice industry should be used for diversification of rice farms.

DA-PhilRice's Palayamanan is a diversified and integrated rice-based farming system that produces rice and other crops, fish, and vegetables.

What is the concept of transformation of the agri-food system?

Transformation can be imagined from the perspective of structure and function. Structure refers to the size distribution of components of a system. It can be imagined as distribution of farm lands to different crops; of time used to grow food; or of money to support various components of the food system. The more important transformation is in function, as it is also the main determinant of structure and the ultimate mix of products and services in the food system. The important roles of a functional food system are to provide: (1) nutritious and healthy food to consumers, (2) adequate and equitable income to its participants, (3) stewardship services to the environment, and (4) to nurture traditional food culture. As pointed out earlier, the existing food systems are unable to perform these functions; thus, they are considered dysfunctional.

What are the needed interventions to transform the agri-food system?

The interventions needed are partly documented in NAST Philippines Food System Vision found at nast.ph. The Vision imagines that the trigger for this transformation is the shift in consumer food preferences from the current trend that is based solely on convenience, price, and taste— shaped by commerce and industry— to one that is data and values-driven, shaped by scientific knowledge. For easy recall, the interventions called for by NAST can be described as 3Ds: de-industrialization, diversification, and digitalization. De-industrialization is the key concept; the two others can be considered as means to this end.

De-industrialization should not be construed as going back to pre-industrial days. It simply means pushing back on the forces (e.g., specialization and mass production/consumption) associated with industrialization that created dysfunctionalities in the food system. It also means leveraging knowledge from years of scientific research about the food system to transform the system. We can no longer ignore the hidden costs that industrialization has exacted on society. De-industrialization is pushing back to enable Philippine society to move forward.

Brown rice or unpolished rice is more nutritious than white rice. It is a good source of fiber, magnesium, and lysine, a protein.

What are the pushbacks to achieve de-industrialization?

Diversification at the consumption end. Our current consumption trends, which are dominated by two species, namely rice and wheat, need to be reversed. A good guide for diversification is the Planetary Health Diet, an innovative science-based diet concept that can provide the health and nutritional needs of consumers, and stewardship of the environment at the same time.
The COVID pandemic has created a growing segment of prosumers (producers who are also consumers), a trend that will promote dietary diversification and restore the lost connection between food production and consumption. Even the urban dweller with little knowledge of farming can now easily grow his own food. Inputs such as seeds and fertilizers can be delivered to his/her doorstep. Controlled environment technology and artificial intelligence allow him/her to produce nutritious food without soil, only little space and time.

Diversification at the farm or community level will be the consequence of diversification at the consumer end. Farm diversification takes the form of more species of crops, livestock, and fish. Some of these may be sold for food; others for feed or industrial uses depending on market demand. In rice, diversification may mean more of the healthier options. But it can also extend to processing and value-adding of end-products, and recycling of waste- and by-products. Processing diversification may mean more brown rice, sprouted, and fermented rice products. Diversification creates opportunities for complementation and integration with the net effect of increased efficiency in using farm space, time, labor and capital, and consequently, higher farmer income. Farm diversification is also the key to environmental stewardship by farmers.

Digitalization creates novel opportunities for the farmers and consumers alike. The most important is empowering them by: (a) establishing direct connection between production and consumption, reducing marketing costs and losses; (b) creating more efficient and timely access to information, government subsidies, and inputs such as capital and technology, and (c) creating new combinations of technologies that can reduce direct and hidden costs of the food system.

Apart from de-industrialization, what are the important things to consider in transforming the agri-food system?

Another pushback is the shift from imported to local food – a decision that can only start with the consumers. This will have lasting impacts on consumer nutrition and health because imported foodstuff are usually ones that are selected by industry for durability during handling and storage, and/or highly processed/chemically treated to extend shelf-life, often sacrificing nutritional and health benefits. On the other hand, local food has evolved in synchrony with the local environment, human and gut microbiota physiology and epigenetics for optimal human and environmental health. Money used to pay for food imports will accrue to the local players in the food system, boosting the local economy.

A final ingredient in the transformation of the food system concerns the status of farmers. Farmers are currently the poorest sector in Philippine society with no stable social protection. This is doing injustice to their role of providing nutrition to society and stewardship of the environment, a role that is arguably more basic than national defense, education, and health care. For this reason, farming does not attract the best and brightest. Transformation of the status of farmers will require legislation on such areas as assuring farmers a comfortable basic income, and providing them with state-sponsored insurance and retirement benefits. If soldiers, teachers and doctors are provided these privileges, why not farmers? It will take an enlightened, bold, and secure national leadership to answer this difficult question. ▪

MAKING CERTIFIED SEEDS MORE ACCESSIBLE

Infographics by: Allan C. Biwang Jr., Charisma Love B. Gado-Gonzales, and Perry Irish H. Duran
Subject Matter Specialists: Dr. Flordeliza H. Bordey, Teodora L. Briones, and Dr. Glenn Y. Ilar

Rice seed production is a tedious process that starts with variety development, which usually takes 5-12 years. After the varieties are approved for commercial release by the National Seed Industry Council, the seeds are multiplied for the farmers to plant.

Easy access to, and availability of inbred certified seeds in every locality help increase farmers' adoption of high-quality seeds. To guarantee that farmers only receive or buy seeds that pass quality standards, DA-PhilRice, other breeding institutions, and the accredited seed grower cooperatives/associations (SGC/As) comply with the seed certification process of the Bureau of Plant Industry – National Seed Quality Control Services (BPI-NSQCS). This comprises the formal seed system.

For the seeds to be called high-quality, they must record a minimum of 98% purity; 14% moisture content; almost no mixtures, weeds, and other seeds (maximum of 0.04%); contain a tolerable 2% inert matter such as soil and stone fragments; and a germination rate of at least 85%. Grains of mixed varieties must not also exceed the maximum limit for each seed class.

Breeding institutions usually produce the breeder and foundation seeds that are used to produce registered seeds. Seed growers commonly buy registered seeds from DA-PhilRice or other DA-accredited SeedNet members to produce the certified seeds usually bought by farmers.

Seed class: **Breeder**

Parent: **Nucleus Seeds**

Tag color: **White**

Grains of mixed varieties/500g seed sample : **0**

Producer: DA-PhilRice, International Rice Research Institute (IRRI), UP Los Baños (UPLB)

Legend:
= pure grains
= mixed grains

Seed class: **Foundation**

Parent: **Breeder Seeds**

Tag color: **Red**

Grains of mixed varieties/500g seed sample : **2**

Producer: DA-PhilRice may supply foundation seeds (FS) to National Seed Network (SeedNet) members to help produce registered seeds (RS). Accredited seed growers and SGC/As with special accreditation may also be given FS to help produce RS if PhilRice and the SeedNet cannot supply the required RS in the area.

Seed class: **Registered**

Parent: **Foundation Seeds**

Tag color: **Green**

Grains of mixed varieties/500g seed sample : **5**

Producer: DA-PhilRice and DA-accredited SeedNet Members (Regional Field Offices, state universities and colleges, and select SGC/As)

Seed class: **Certified**

Parent: **Registered Seeds**

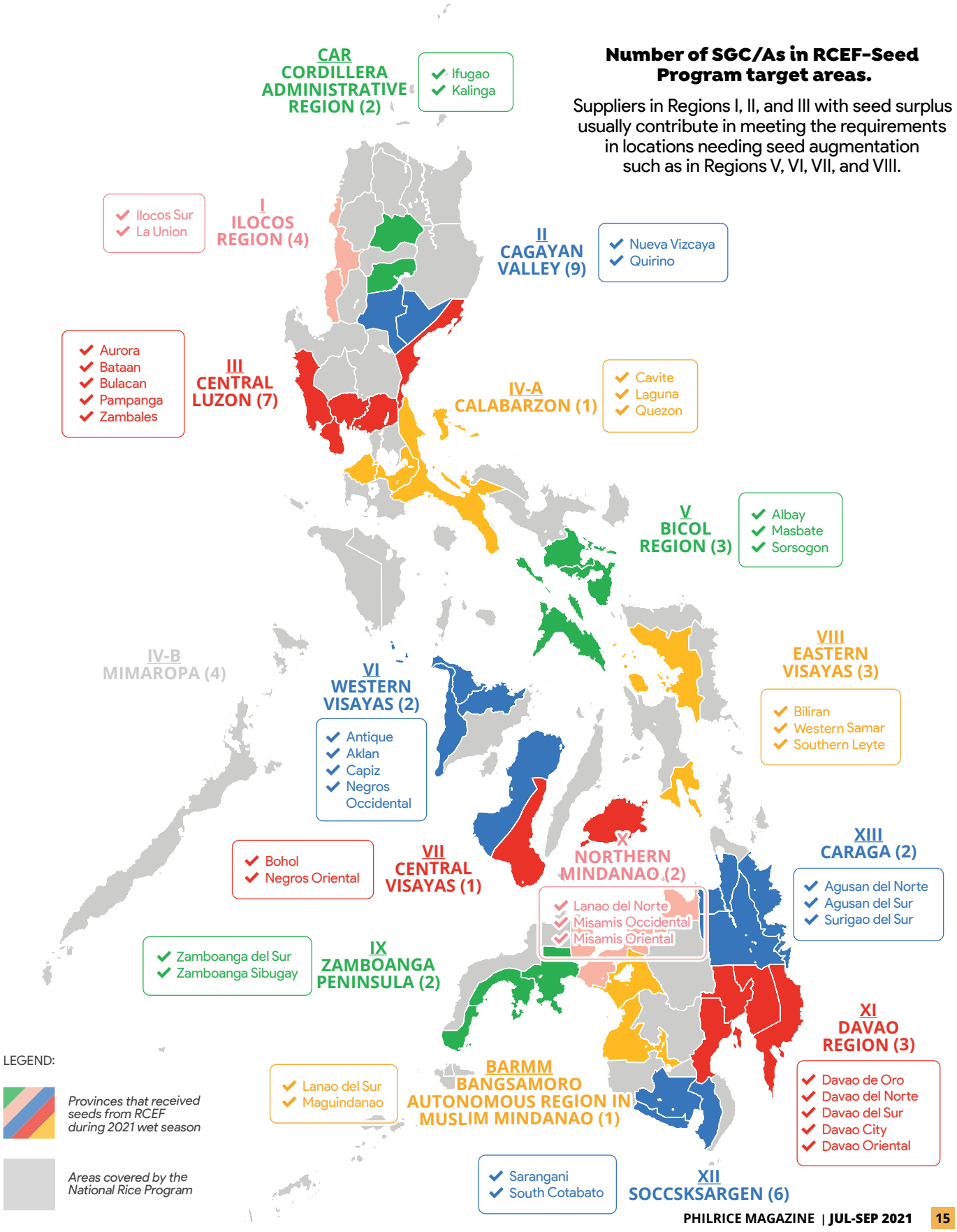
Tag color: **Blue**

Grains of mixed varieties/500g seed sample : **20**

Producer: BPI-NSQCS accredited seed growers/associations/ cooperatives, private seed companies

*Breeder and Foundation Seeds may be downgraded to registered or certified seeds if certification standards based on seed class are not met.

Government programs such as the National Rice Program and the Rice Competitiveness Enhancement Fund (RCEF)-Seed Program provide free certified seeds to the farmers. As of June 2021, the RCEF-Seed Program has distributed 6.5M bags of free certified seeds to over 1.2M rice farmers after four planting seasons of implementation since 2020 dry season. Seeds were procured from well-reputed and BPI-NSQCS-accredited SGC/As.



Informal Seed System

Written by: Aldrin G. Castro
Infographics by: Perry Irish H. Duran
Subject Matter Specialist: Dr. Glenn Y. Ilar

In the informal seed system, farmers themselves produce, store, disseminate, and access seeds directly from their own harvest through exchange and barter among friends, neighbors, and relatives; and through local seed businesses. It is flexible and accessible as farmers have total control. However, they are also responsible for the quality of the rice seeds as these do not undergo the formal certification process.

Community Seed Banking - it is the process of storing seeds shared by the community. In a farmers' cooperative/association, for example, the members can store, sell, borrow, share, and buy seeds from the bank. The president or chairman manages and controls the seed bank.

Farmers save good seeds and store every after harvest to be used for the next planting season. They often share, sell, or give among their relatives, neighbors, and friends for planting. Other seeds are kept for personal use while the rest are sold for commercial purpose (e.g., milled rice). The problem in this system is that the viability of seeds may deteriorate through time.

Some farmers receive certified seeds from local or national government projects, which they can use as starter seeds to produce their own high-quality seeds for the next cropping season.

Some farmers would sometimes visit nearby areas to purchase (non-certified) seeds from other farmers.

Some seeds multiplied through the informal system may have originally been bought from accredited growers selling certified seeds.

COMMUNITY SEED BANKING WORKS

ALDRIN G. CASTRO

Iloilo upland farmers including Pedro L. Franco get their continuous supply of rice seeds from a community seed bank.

The Blaan tribe, in which Maribeth S. Ditan belongs, preserves their traditional seeds through the informal seed system.

Rice farming, particularly in uplands where it is done only once a year, cannot be postponed to a later year for whatever excuse there might be. Upland farmers depend much on their limited rice produce, supplemented with other staples.

The community seed banking (CSB), a good practice under the informal seed system leads farmers into producing, saving, and sharing their seeds. They each retain from their harvest a certain amount of seeds for the next cropping season, ensuring an adequate supply of good seeds in communities without commercial seed centers. Equally important, this system helps farmers conserve their traditional varieties, which is a significant item in the agenda of the UN Food Systems Summit in September 2021.

In their 2005 book titled, "The rich but little known chronicles of community seed banks," Vernooy et al. said that such banks, which have been around for about 30 years [in some countries], were designed to "conserve, restore, revitalize, strengthen, and improve local seed systems, especially, but not solely, focused on local varieties."

Let us go through stories from farmer-leaders who have been doing CSB for years already.

Seeds assured

For Pedro L. Franco, 56, one of the founding members and the current president and chairman of the Barangay Impalidan Upland Farmers' Association (BIMUFA) in Calinog, Iloilo, CSB has saved their community from the uncertainties of the COVID-19 pandemic.

"Our farming activities continued, thanks to CSB. Without it, we wouldn't have a place to go," the farmer for three decades said.

This practice in the upland areas, Franco said, was introduced to them by DA-PhilRice and their local and provincial governments through the then Upland Rice Development Program in 2013, which was funded by DA-Bureau of Agricultural Research.

"We had a season-long training on rice and high-value crops that lasted for 20 weeks. We learned a lot particularly the proper way of storing our seeds for the next planting season," Franco recalled.

Franco explained that under the system, association members can avail of seeds on condition that they will return 50% more of the seeds after harvest to replenish the group's available seeds. If a member borrowed 40kg, he/she will return 60kg as payment.

Members bank seeds of Malido, the traditional rice that the people of Calinog are proud of. The variety has two types, red and white, which both emit aroma and mature in 120 days.

Franco admitted there's nothing special about how they store their seeds. They assure quality by merely keeping the seeds clean and dry, disposing undeveloped grains, and properly packing and labeling them.

Tradition breathes on

In the outskirts of Datal Tampal, Malungon, Sarangani, we find the Lamlifew Tribal Women's Association where the Blaan tribe survives with their culture and traditions.

Maribeth S. Ditan, 47, member and treasurer of the association for a decade now, testifies to these living traditions - one of which is the way the community stores their traditional rice varieties.

"Every after harvest, we know which panicles/grains to choose for consumption, for celebration, and for storing just by picking them manually," the seasoned farmer said.

After selecting the grains for storage, 4kg of it will be properly sealed in bamboo tubes then stored in the corner ceilings of their houses.

"Seed banking helps us a lot, we can share and lend seeds to our members. If we borrow one bamboo tube of seeds (4kg), we'll return two cans of biscuit full of seeds (5kg/can) in the harvest season," Ditan said.

"We are not affected by the pandemic at all because our tribe has zero cases of COVID-19. Maybe, it has something to do with what we eat in the community. Our rices are Panumay and Fanifattan, and we eat vegetables and drink herbal teas every day," she added. ▪

> "Our farming activities continued, thanks to CSB. Without it, we wouldn't have a place to go."
>
> **-PEDRO L. FRANCO**
> Farmer

Profitable, risk-free shift for the ENVIRONM

MONICA L. CAB-AD AS TOLD TO ANNA MARIE F. BAUTISTA

For Marie Haga, associate vice-president for External Relations and Governance of the UN's International Fund for Agricultural Development, farming families can "break the vicious circle of hunger and conflict." These families are usually involved in small-scale agriculture, which is seen as key to "food systems that contribute to peaceful and healthy communities." As 2 billion people depend on the world's 500 million small farms, Haga said that farming families have great "potential to contribute more to well-functioning, sustainable food systems." She added that smallholder farmers tend to take better care of the environment.

In this farmer's account, a member of a farming family details their agricultural practices, which produce good crops without harming the environment.

I am Monica L. Cab-ad, 58, a rice and vegetable farmer for life.

Even as a child, I knew that I would stay in this kind of work. It was my family's identity. For years now, I had been managing a 1,500m² land that can be reached through a 30-min walk from our home in Sitio Tumpic, Labueg, Kapangan, Benguet. It is owned by my cousin but we agreed that I could farm there as long as I pay for the land tax. It is subdivided into three unequal parts.

Every August, I plant Wagwag, a traditional red rice, which I believe is native in Kapangan. We tried other varieties that didn't yield well. Wagwag matures in five months. In one part of the land, we could harvest 30 cans of rice (metal cans of oil). Every harvest, we set apart four cans of seeds for the next planting season. We produce rice for home consumption only. It is delicious and has good aroma.

During the other months, we plant fast-growing vegetables such as california bell pepper, french beans, ginger, and corn. This is where we get our family income. My main farm helpers are my children. I have 12 kids but five already have their own families. They help clean the farm surroundings, transplant and harvest, and prepare food for us.

Changing patterns

Our farm life gradually changed when I enrolled in training programs/courses and seminars on Good Agricultural Practices (GAP) sometime in 2017. The DA-Cordillera Administrative Regional Field Office (DA-CARFO) and our municipal agriculture office (MAO) invited us to join in these activities.

They also toured us in GAP-certified farms in La Trinidad, Mankayan, and Tuba towns. As I listened to the stories of these successful farmers, I began to believe that I could also do well in my own farm.

I applied the lessons gradually in my farm. In January 2019, I did it head on. My farm was GAP-certified in Sep 2019.

We started off by fixing the farm shed. When it was completed, we divided it into the dining, cooking, storage, and wash

> Income-wise, GAP-certified produce commands better prices.
>
> **-MONICA CAB-AD**
> Farmer

areas. My husband also built a wooden cabinet where we could properly store the tools and farm inputs. That cabinet was big and heavy. From our house, we transported it to the farm. People thought we were carrying a coffin! Some suspected we were not in our right minds for all the things we were doing in the farm. I would always answer them *pagsayaatan diyay* (it's for our own good).

We also secured a seedling nursery, a separate area for composting, and a mixing area for chemicals that is far from the rivers. We also designated entrance and exit points in the farm.

It's uncommon for us to have a proper comfort room near the farm. Before, we always ensured that we were all settled and relieved before heading to the farm. If we needed the CR, we had to go back to our house. But then GAP emphasized the need to have a well-situated CR in the farm that will not contaminate the water source or the crops we produce.

It took us a lot of time, effort, and resources but I saw how everything gradually made a difference. When we committed to undergo the certification process, DA also provided us with assistance such as vegetable crates, fertilizers, knapsack sprayer, drums, and plastic rolls for our greenhouse.

By the time my family and I finished the setup, I was pleased with the results. Since then, I felt I was home when I was in our farm. Funny enough, our farm looked more presentable than our house because it was more organized. You can see the farm tools in the kitchen, in the living room, anywhere in our house!

We were also taught not to use chemical inputs excessively, unless the pest infestation is extreme. That's actually the number one lesson that struck me. Even before we didn't spray chemicals on our rice crops. Rats infest once in a while. We just clean the surroundings and uproot the weeds to remove their shelter.

On the other hand, we used to apply chemical pesticides on vegetables, although it was not as excessive as the others. I tried to look for alternatives so I could follow the principle. Now, I only use in small amounts chemical inputs that are labeled green, unlike before when I used either blue, red, or yellow. These three colors actually have stronger poisons.

Good, pleasing results

It was difficult but worth it. Things are in their proper places. I am enjoying every minute in our well-organized farm. What more, when we have to relieve ourselves, we don't need to run home because we already have a clean CR nearby!

Income-wise, GAP-certified produce command better prices. Our buyers usually add P10.00 on top of the current market price. If french beans sell at P50/kg in the market, our produce is bought at P60.00/kg.

We experienced selling our bell pepper to Jollibee through an agreement they made with a farmers' association we know. Our group, the i-Kapangan Farmers' Entrepreneurship Organization also has a stall in the Benguet AgriPinoy Trading Center. My vegetables are also sold through acquaintances in the Baguio City and La Trinidad public markets.

This current pandemic affected our sales because of the limited mobility and travel of buyers. Good thing, we can exchange goods with our neighbors. Because of the abundant supply, my fellow farmers and I opted to support a community pantry in La Trinidad. We shared our rice and vegetable produce. Although our sales were low during that time, I am still thankful that we have enough food at home, and we are still able to share it with others.

Mayat ti GAP (GAP is good). I am sure that my family and my neighbors eat safe and healthy food. After all, I am accountable for what we eat. I have also minimized my farm expenses while securing a good harvest because I don't need to buy many chemical inputs. It's even more satisfying to know that I am helping conserve our environment by not using chemicals that can contaminate the rivers and our surroundings. ▪

Family farming is supported in a transformed food system because of its potential to produce quality, safe food without harming the environment.

EINAR M. DE MESA

JEHANEL V. SORIANO

ANTONIO T. SABANGAN

MARY GRACE M. NIDOY

revolution OF THE young

From igniting movements to catapulting global phenomena in technology, politics, and business, the youth has played a big role throughout our history. Armed with idealism, zeal, and passion, the world's young cohort continues to grow in terms of population.

According to the UN Population Fund-Philippines, our country now has the largest generation of young people in history with 30 million aged 10-24 years old, accounting for 28% of our population.

With a gamut of challenges facing the food systems, engaging the largest youth generation is inarguably necessary. This surfaced in a recent dialogue organized by the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) on ASEAN's food systems where the youth's perspective was taken into account to help transform higher agricultural education.

Toward the 2030 agenda and intensifying momentum leading up to the UN's 2021 Food Systems Summit, the world needs the youth more than ever. When the world is at a standstill, some take various pathways to transform food systems, starting in their own community. Here are the young people helping to make our food systems more sustainable, profitable, and resilient:

JEHANEL V. SORIANO, 25
Entrepreneur

This 2017 agribusiness graduate from Central Luzon State University immediately put up her own agriculture supply store in her birthplace in Ilagan City, Isabela.

"When I was young, I enjoyed selling goods from our sari-sari store. I've always been a business-minded person since then," Jehanel recalled.

Even before the pandemic stunned the world in March 2020, she had quit her job as a market inspector in a government-owned research center and enrolled in the Rice Competitiveness Enhancement Fund-Rice Extension Program's Training of Trainers to start her own farm school. While the process from applying as a learning site to farm school was rigorous, Jehanel said it was all worth it. Since its establishment in July 2020, her Jesla Integrated Farm has trained 200 farmers.

With her entrepreneurial mentality, she also availed of the DA-Agricultural Credit Policy Council Program for her layer production business worth P5 million.

EMMANUEL R. SALONGA

ANTONIO T. SABANGAN III

LAWRENCE L. CHUA

"The pandemic has made me realize the importance of food and our farmers. In agriculture, young people could engage in business and help the producers of our food at the same time," Jehanel said.

ANTONIO T. SABANGAN III, 30
Farmer-leader

Fondly called "Akim", he is a former overseas Filipino worker-banker in Saudi Arabia. In 2018, his uncle convinced him to go back to the country for good and manage their 2.5-ha farm.

"At first the farm was only intended for our own sustenance but the way we look at agriculture has changed. We realized that the farm can serve more people," Akim said.

He then availed of government's free training courses and established a farm school in Botolan, Zambales called Bukid ni Tatay, in memory of their grandfather who had always wanted a farm for his family.

For Akim, farming is a vocation that is "meant to serve others". He did so when he became part of the province-wide organization together with his classmates in the training courses. The members of the Pagasa Youth Farmers Association recently partnered with the Department of Trade and Industry so they could sell their products in various trade fairs.

"There are so many opportunities waiting for young farmers. I aim to bring these opportunities to them through our association," Akim declared.

> Every aspect of agriculture opens more doors for you.
>
> -LAWRENCE L. CHUA

LAWRENCE L. CHUA, 29
Farm mechanization advocate

It took many jobs in the corporate world and business ventures before Lawrence found himself planting rice in the farm.

In 2018, this civil engineering graduate from De La Salle University acquired an 8-ha land in Tumauini, Isabela and developed it into a farm school and integrated farm. Since then, he has been based in Isabela and enrolled himself in various training courses given by the government.

For Lawrence, everything starts with a mindset. He is, of course, speaking from his experience as he now sees farming as the most sustainable venture. He believes that farm mechanization is the way to go forward in terms of promoting agriculture to young people.

"The youth have this perception that farming is tedious but with machines now roaring and readily available, we can easily entice them to venture in agriculture. My advice to them is to try it first before condemning the sector," Lawrence explained.

"Every aspect of agriculture opens more doors for you," he added.

For instance, the youth could make a profit out of the many productions that agriculture could offer. Lawrence wants to reinvent the farmers' image and envisions many more of them in business suits in the future. ▪

VEGGIE DELICACIES

COMPILED BY: SARAH JOY N. RUIZ

In a Food Systems Summit public forum conducted to tackle action track on "ensuring access to safe and nutritious food for all" in November 2020, plant-based diet was placed forth as a theme. The forum was participated in by representatives from 10 countries including USA, UK, Italy, and India. Based on data, food is responsible for 30% of greenhouse gas emissions, whereby livestock or meat is responsible for the 25%. As such, reducing carbon footprints through locally sourced vegetables will not only make us healthy, but also result in a sound, robust environment.

In these recipes, the humble, ordinary vegetables are made more exciting and delectable!

MUSTASANG KIMCHI

Preparation Time: 4-5 days; Makes 1 Jar

Ingredients:

1 bundle	fresh mustasa
2L	water
6tbsp	sea salt
1tbsp	grated garlic
1tsp	grated peeled fresh ginger
1tsp	granulated sugar
2tbsp	fish sauce or soy sauce
3½tbsp	red hot pepper, powdered
4 pc	medium scallions, trimmed and cut into 1-in pieces

Procedure:

Mix Brine and Mustasa

1. Dissolve 6tbsp sea salt into 2L of water.
2. Sort and remove wilted mustasa leaves. Add leaves to brine and submerge using a plate or weight, and let them sit for 2h.
3. Rinse the mustasa under cold water 3 times. Set aside to drain in a colander for 15-20min.
4. Cut the mustasa into 1-2in and cut larger leaves lengthwise.
5. Add the garlic, ginger, red pepper, fish or soy sauce, 44ml water, and scallions. Stir into a smooth paste. Set aside until mustasa is ready.
6. Combine paste and mustasa.
7. Gently squeeze any remaining water from mustasa and add it to the spice paste and scallions.
8. Wear gloves and using your hands, gently mix the paste into the mustasa until it is thoroughly coated.
9. Pack and ferment the kimchi in a jar. Push down the kimchi until the brine rises to cover the mustasa leaving at least 1-in of space at the top. Seal the jar.
10. The mustasa will start fermenting a day or two at room temperature, depending on the temperature and humidity of the room. The warmer and more humid it is, the faster the kimchi will ferment. It will then smell and taste sour. Press the top of the kimchi with a spoon to release bubbles from beneath.
11. Check the kimchi once a day by pushing down the mustasa with a clean spoon to keep it submerged and soaked in the brine.
12. When the kimchi tastes good enough for your liking, transfer the jar to the refrigerator. You may start eating it right away, but it's best after another week or two.

PICKLED KANGKONG

Preparation Time: 45min/ Makes 1 Jar

Ingredients:

4c	kangkong stems and leaves, cut into 1-in pieces
1 pc	large garlic, peeled and sliced
2 pc	red bell peppers, sliced thinly
1 pc	small onion, sliced
1 pc	ginger, peeled and cut into strips

Pickling Solution:

1½c	cane vinegar
1½c	sugar
1tsp	salt

Procedure:

1. Cut the stems and leaves into 2-3cm. Wash thoroughly and drain.
2. In a pot, blanch the kangkong stems for 3-4min. Drain the excess water and soak the stems with ice water in a bowl for 3min.
3. Mix the vinegar, sugar, and salt and stir constantly to dissolve. Transfer in a sauce pan and simmer the mixture. Once it starts boiling, add the onion, garlic, red bell pepper, and ginger. Simmer the pickling solution for 2min. Allow to cool.
4. Mix the kangkong and the pickling solution in a bowl and transfer in a medium jar. Let it cool down before sealing the lids.
5. Refrigerate for three days to allow improvement of flavor before serving.

Power-up with clean machines

COMPILED BY: REUEL M. MARAMARA AND JERALD L. BERNADES
SUBJECT MATTER SPECIALIST: DR. RICARDO F. ORGE

Filipino rice farmers spend most of their production cost on labor. They devote more than 65 days for it—an exhausting feat that experts argue can be evaded through mechanization. However, most machines use fossil fuels, which prices are rising. When burned, fossil fuels produce lots of carbon dioxide (CO_2), a dominant greenhouse gas that traps heat in the atmosphere, causing global warming and leading to changes in weather patterns that negatively affect agricultural production. Hence, DA-PhilRice has developed machines that help farmers produce crops efficiently and preserve the environment, too. Some of these machines produce carbon-sequestering biochar as their by-product and can possibly be labeled as carbon-negative technologies, since their emission could be less than the amount of greenhouse gas removed by their fuel (biomass) through the process of photosynthesis. Let's meet these machines:

WIND PUMP

The wind has long been recorded in history as an efficient source of energy. At DA-PhilRice, the wind is being utilized for the wind pump-drip irrigation system that consists of a 24-bladed 10m-tall windmill, water pump, water tank, and a drip irrigation system that efficiently waters the plants. Research argues that this system can pump water enough for household use and irrigate 0.3ha to 0.5ha.

Energy source: Wind energy
Rotor diameter: 4.5m
Pump: 44mm (1 ¾in) deep well pump or 102mm (4in) jetmatic pump
Typical output: 250-500mL/s on pressure-compensating drip emitters or 10-20m^3 /day at 6-12m suction head

RICE HUSK GASIFIER STOVE

Unlike most rice husk-fueled stoves in the market today that produce more smoke, the gasifier stove has blue flame and cleaner emission. It is a cheaper alternative to liquid petroleum gas-fueled stoves and more environmentally friendly as it uses farm biomass as fuel, and has zero or even negative net carbon emission.

The carbonized rice hull (CRH) produced during the process using this machine can be used as a soil conditioner.

Ignition time: burning starts after 1min upon dropping a burning paper
Fuel requirement: 0.8kg rice hull/load
Operating time: 30min/load
Fan: 9 watts, 12 volts
Water boiling time: 11min for 2L of water

RICE HULL GASIFIER ENGINE-PUMP SYSTEM

Developed particularly for rainfed lowland rice farmers, this water pump system utilizes the rice hull as an energy source and produces carbonized rice hull (biochar) as a by-product. It is made of several components such as a reactor, condenser, filter, scrubber, gas tank, engine, and water pump.

The CRH produced during the process using this machine can be used as a soil conditioner.

Fuel consumption: 8.5kg rice hull/h
Firing time: 5min
Startup time: 5min
Operating time: 120min
Water discharge rate: 8-10L/s
Pump size: 76mm (3in) diameter
Labor requirement: 1 person

CtRH CARBONIZER

The continuous rice hull carbonizer (CtRH) is a generally smokeless technology that converts rice hull into CRH that can be used as a soil conditioner. The machine also allows heat recovery for various applications like cooking, which conventionally uses fossil fuels.

Ignition time: <2min
Input capacity: 20-26kg/h rice hull
Operation: Continuous mode
Charcoal yield: 35-42%

For more information, please contact the DA-PhilRice Text Center at 0917-111-7423.

WOME

find new aspirations in RiceBIS

MERVALYN O. TOMAS

The RiceBIS community project helped women-farmers in Zaragoza including Merlita I. Ulip (1st from L) and Marites A. Benico (2nd from left) to become agripreneurs. They now sell brown rice and rice brew in their store in Macarse and through online: https://www.facebook.com/pnamc.store/.

Darkness starts to engulf the remaining light of the day but the rustles have not slowed down a bit inside the Pinagbuklod na Adhika Multipurpose Cooperative (PNAMC) facility in Macarse, Zaragoza, Nueva Ecija. The last sack of *palay* was poured into the brown rice milling machine. Several women can be seen filling plastic bags labeled "Macarse Brown Rice".

In a transformed food system that is gender-responsive, opportunities are given to women to help them become key players in the value chain; breaking from their usual roles as mere producers. Among the women working on brown rice trading are Marites A. Benico, 41, and Merlita I. Ulip, 51, who used to be only involved in rice farming.

Marites shared that she has been with the cooperative since 2016.

"We moved to this place from nearby Barangay Del Pilar in 2013 to try our hands at farming. My husband's grandparents have a 2-ha farm here," she said.

Merlita, on the other hand, grew up in Macarse. She has been helping in the farm since she was a child until she decided to work in Manila at 17 and eventually went abroad. She was an overseas Filipino worker until 2010 when she had to take care of her aging mother as her two siblings had their own families.

"After a year, I decided to take over the 3-ha rice farm my mother was managing," she recounted.

A step up with RiceBIS

It did not occur to both Marites and Merlita that there could be more to rice farming.

"I grew up contented with harvesting enough for our food, with a little excess that we can sell for other needs. It did not cross my mind that we can harvest more than we used to," Merlita said.

In 2017, both ladies participated in the training courses offered by DA-PhilRice's Rice Business Innovations System (RiceBIS) Community Program.

"Before RiceBIS, harvest from our 2-ha farm has been 180-200 cavans (58-59kg each). Now we harvest 200-230 cavans," Marites recalled.

PINAGBUKLOD NA ADHIKA MULTIPURPOSE COOPERATIVE

The same can be said of Merlita.

"We used to harvest around 200 cavans (58-60kg each). When we applied what we learned during our RiceBIS training activities, our harvest shot up to 300 cavans," she said.

She added that her expenses for agricultural inputs were also reduced.

"Before RiceBIS, we sowed too much seeds. Now, we learned to reduce it. We also learned to lessen pesticide application," she related.

More than production

Marites and Merlita are thankful that their produce is increasing. However, there was one problem.

"We were at the mercy of *palay* traders. We could only gain more if the price of *palay* increased. For us to sell our produce at a higher price, we should process them on our own," Merlita said.

With this observation, she remembered, their cooperative tried *palay* buying in 2019.

"We saw how our profit increased, individually and as a group. We are now trying to acquire a facility for *palay* storage so that we can continue this business. Now, our products are brown rice and rice brew," she narrated.

"We're still just starting to market our products, but we are thrilled that more customers are ordering in bulk," Marites cannot hide her excitement as she rejoiced at the achievement of their group.

She added that by processing part of their produce to brown rice, they are able to sell it at P50/kg compared with P16-P19 if sold as *palay* to the traders.

Learnings for life

For Marites, the impact of joining government programs on her life is more than their group's success.

"Joining RiceBIS made me realize that I can do more things as an individual for my family and community. When I got married at the age of 18, I thought my life would only revolve around staying at home and taking care of my kids and my husband. But now, I learned that I could achieve more," she disclosed her aspiration.

With her cooperative membership, she feels fulfilled.

"After I learned the basics of how to be an entrepreneur, I started my own business. I make espasol and leche flan so I gain additional profit," she said.

She confided that in her journey, she also encountered challenging times. "We struggle at first but if we make it prosper, we can help others to do better too," she stressed.

In terms of rice farming, she learned to be open-minded.

"We should not limit ourselves to producing and selling to traders. We can also process our produce, we can think of other ways and be smart in our decisions," Marites said.

Merlita also shared how she is delighted that they are also able to help other farmers in their community.

"I encourage other farmers to join farmers' groups or cooperatives and government programs because with this, they can learn and earn more than they used to," she said.

The hustles and bustles of daily life are not new to these women, but with this new endeavor, as the last pack of brown rice is sealed and the rustles fade, their cheerful voices chorus a new spark of hope and aspirations. ▪

> "We should not limit ourselves to producing and selling to traders. We can also process our produce, we can think of other ways and be smart in our decisions."
>
> **-MARITES A. BENICO**
> Farmer

WHAT IS WRONG
with the Philippine food system?

DR. FERMIN D. ADRIANO
DA Undersecretary for Policy, Planning, and Research

The Scientific Group of the UN Food Systems Summit 2021 defines "food systems" as the whole range of activities that "include the related resources, the inputs, production, transport, processing and manufacturing industries, retailing, and consumption of food as well as its impacts on environment, health and society." The definition goes beyond the traditional "farm to fork" (production to consumption) concept but extends to cover nutrition, sustainability of food production (environment including climate change and the provision of sustainable livelihood to food producers) and the governance (institutions) of the food systems.

A recent publication of the Organization for Economic Cooperation and Development (OECD), based in Paris, France, assessed how 54 developed and developing economies in the world responded to the challenges facing the food systems, particularly during the COVID-19 pandemic year of 2020. Its chapter 22 was specifically devoted to analyzing the Philippine agricultural sector's performance.

The 605-page publication titled, "Addressing the challenges facing the food systems," released this year highlighted three conclusions.

One is that, as expected, agricultural policy changes in 2020 were dominated by the responses to the COVID-19 pandemic, particularly on how to ensure that the food supply chains were functioning in ensuring a steady flow of food to the urban centers where the bulk of the population is concentrated.

Two, consumers and taxpayers actually provided substantial support to the agricultural sector across developed and emerging economies through market price support. Instruments used to achieve this were actual price subsidy and the imposition of high tariffs on agricultural and food imports.

And three, it concluded that overall, the current support policies are not serving the wider needs of the food systems because the bulk of the assistance should have been devoted to research and development (R&D) that will dramatically raise productivity and minimize losses, biosecurity to ensure protection of human, animal and plant health, and infrastructure to lower transport costs and minimize post-harvest losses.

The report adds that such a shift in policy and support will be able to address the triple challenges facing the food systems, which are: (a) delivery of food security and nutrition for the growing population (b) provision of adequate income and livelihood to millions of production and processing workers, and (c) contribution to achieving sustainable development (reduction of greenhouse gas emission, and climate change adaptation and mitigation).

Philippine agriculture's performance

Examining the Philippine agriculture's performance on challenges confronting the food systems, the report noted that the support to Filipino farmers from 2018 to 2020 averaged 20.7% of gross farm receipts. It added that this is up by 22% at the beginning of 2000s, and higher than the OECD average and one of the highest levels among all the developing emerging countries assessed by the report.

Most of the support, the report continued, went to rice productivity enhancement measures in line with the previous goal of attaining rice self-sufficiency. It observed that Philippine agricultural policy on rice runs in contrast to the trend elsewhere in Southeast Asia wherein the targeted goal for the agricultural sector is toward diversification into higher-value commodities.

Moreover, the report stressed that the Philippines is particularly vulnerable to climate change and natural disasters. Unfortunately, the response to these twin threats is highly inadequate.

The OECD report recommended that to improve the Philippine agriculture's response, "the government should develop clear and measurable objectives on climate adaptation and ensure a coherent set of measures to implement across policy programs and public agencies."

Implication of the OECD report

What is the significance of the OECD's report to ordinary Filipinos? Its value lies in its affirmation that the economically illogical protectionism at all costs by the government across agricultural commodities yielded greater costs than benefits to ordinary Filipinos. Instead of investing in programs and projects to improve productivity of our farmers and fishers, expenditures were devoted to subsidizing prices that producers receive, the costs of which were eventually shouldered by the consumers. This explains why despite the decreasing supply of certain commodities (i.e., pork, chicken and fish), their total values (costs) are increasing.

Protectionism is a lazy man's policy instrument. Instead of thinking of ways of increasing the productivity of the producers and funding these activities, all one has to do is to issue an edict to prevent entry of imports that compete with the local produce. Protectionism induces one to be indolent because it assures producers high prices for their products regardless of whether they introduce technological innovations to increase their farm yield. The overall result of such a policy framework, if implemented for decades, is noncompetitive and inefficient agriculture sector.

Dr. Ramon Clarete, former dean of the UP School of Economics, in a recent article noted that the lackluster performance of our agricultural sector can be traced to its low participation level in global agricultural trade because of protectionism. Because it was not exposed to competition, there was no urgency on the part of our agricultural producers to innovate and increase their productivity per unit of labor and per unit of land.

Recommended measure

It is within this purview that the OECD report stressed that agricultural support should be focused on R&D, biosecurity and infrastructure that reduce agricultural production and logistical costs. These are public goods that warrant government support.

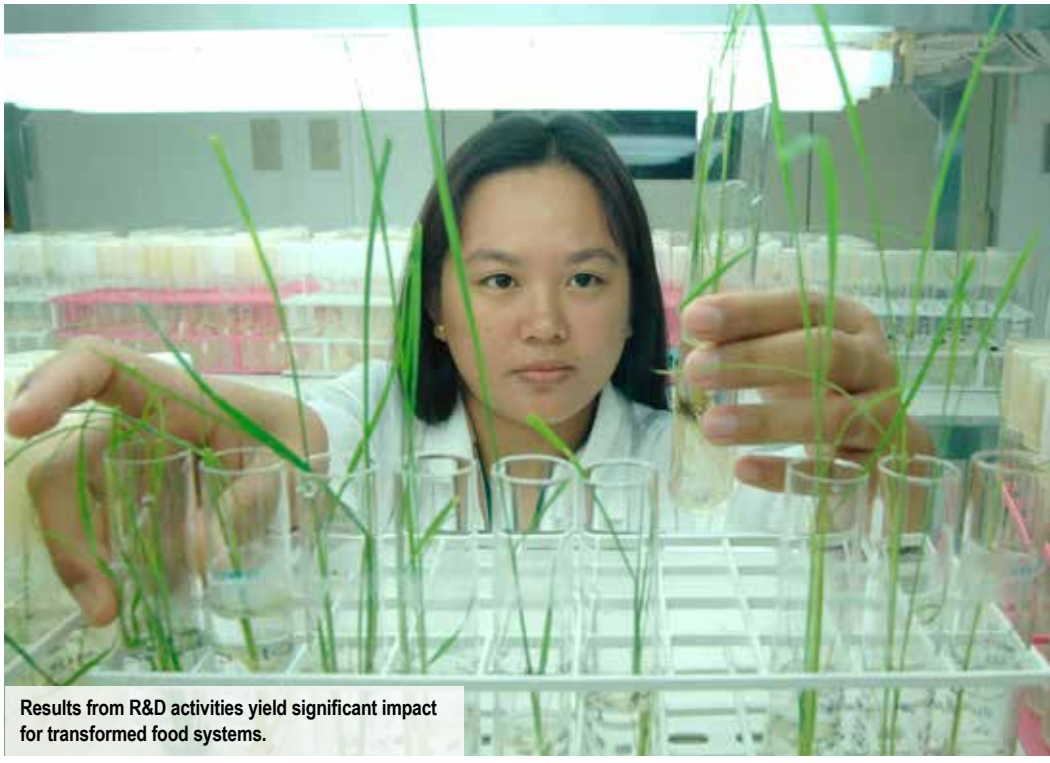
Politicians may be apprehensive that good economics might not necessarily be good politics. They may think that implementing sound economic measures may not win them votes in the next election.

However, the two are not mutually exclusive. Adopting good economic measures can lead to a stronger economy, and in particular a robust agricultural sector, and win votes at the same time. What is critical is the formulation of a development plan that pinpoints where those assistance are needed most and provide the corresponding funding support for them. This will be the best use of scarce government resources.

Dole out-type of assistance only yields short-term gains. It does not build a strong economy and nation. It might win votes but sooner or later the bankruptcy of this approach will be exposed because it is not sustainable given limited government resources.

This is the reason why traditional politicians come and go because they never attempt to build a strong nation but look only after their or their family's welfare though pretending to serve the public. ▪

(First published in The Manila Times on July 1, 2021.)



Results from R&D activities yield significant impact for transformed food systems.

HELP SLOW DOWN GLOBAL CLIMATE CHANGE!

WAYS TO REDUCE GHG EMISSION FROM RICE PRODUCTION

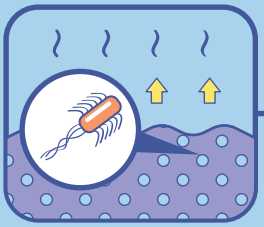
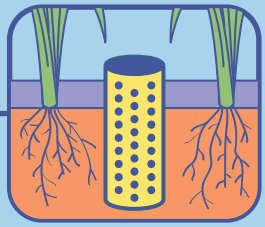
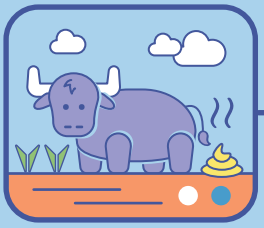
Infographics by:
Mervalyn O. Tomas
Perry Irish H. Duran

Subject Matter Specialist:
Dr. Elmer G. Bautista,
Supervising Science Research Specialist, Scientist I, DA-PhilRice

Farmers now suffer the brunt of climate change as it negatively impacts agricultural productivity. It's not only the farmers who are affected but also the entire food system. The UN Food Systems Summit 2021 is calling for a transformed system that is not harmful to the environment, and can reduce the impact of climate change.

Climate change cannot be stopped overnight but it can be slowed down by reducing greenhouse gas (GHG) emissions responsible for the increase in global temperatures.

A study on GHG emissions from rice production in the Philippines by Dr. Elmer G. Bautista of DA-PhilRice and Masanori Saito of Tohoku University in Japan pinpointed the sources of emissions and how these can be reduced.

SOURCES OF GHG EMISSIONS	WAYS TO REDUCE
 *Flooding creates an ideal condition for bacteria that emit methane to thrive.*	*Any farming method that reduces or interrupts the period of flooding like the alternate wetting and drying irrigation technology can reduce methane.* 
 *Excessive application of nitrogen-based fertilizers causes the emission of nitrous oxide.*	*Apply only the right amount and kind of fertilizer.* 
 *Use of carabaos/cows contributes to GHG emissions. Animals and their manure are methane sources.* *In the study, emissions from rice production carried out with both hand tractors and carabaos totaled 13.3 Tg CO_2 eq./year. If hand tractors were to take over, emissions could be reduced by 0.19 Tg CO_2 eq./year.*	*Field operations that use animals could instead employ agricultural machinery.* *This speeds up work, which reduces emissions from soil organic decomposition between work periods.* 
 *Incorporating fresh grass and rice straw in wet land preparation.*	*Decompose grass and rice straw first before incorporating into the soil.* 

References:

Bautista, E., and Saito, M. (2016). Greenhouse gas emissions from rice production in the Philippines based on life-cycle inventory analysis. WFL Publisher. https://www.researchgate.net/publication/273636139_Greenhouse_gas_emissions_from_rice_production_in_the_Philippines_based_on_life-cycle_inventory_analysis

Searchinger, T., and Waite, T. (2014, December 16). More rice, less methane. World Resources Institute. https://www.wri.org/insights/more-rice-less-methane

Sustainability, food security and climate change: three intertwined challenges. Food and Agriculture Organization of the United Nations. http://www.fao.org/climate-smart-agriculture-sourcebook/concept/module-a1-introducing-csa/chapter-a1-1/en/

Choose Riceponsibly

Infographics by: **Mervalyn O. Tomas and Perry Irish H. Duran**

Being responsible in our food consumption helps address problems that cut across different areas in our food system, such as food security, nutrition, and provision of adequate income and livelihood to production and processing workers.

How riceponsible are you?

Follow the arrows you agree with.

I always make sure that the rice I buy is from our local farmers.
- Yes → I only cook the amount of rice my family can eat.
- No → I only eat white rice.

I only cook the amount of rice my family can eat.
- No → I finish off the rice I put on my plate because I only get what I can eat.
- Yes → I make sure that the rice I cook does not get burned.

I only eat white rice.
- No → I finish off the rice I put on my plate because I only get what I can eat.
- Yes → I like imported rice better.

I finish off the rice I put on my plate because I only get what I can eat.
- Yes → It's alright to burn rice a little bit when cooking. Only a small portion would be wasted anyway.
- No → I prefer to eat healthier rice, such as unpolished or brown rice and pigmented rice, and healthy rice-based products.

I like imported rice better.
- No → It's alright to burn rice a little bit when cooking. Only a small portion would be wasted anyway.
- Yes → It's okay to leave a little rice on my plate.

I make sure that the rice I cook does not get burned.
- Yes → I tell others to consume rice responsibly like I do.
- No → It's alright to burn rice a little bit when cooking. Only a small portion would be wasted anyway.

It's alright to burn rice a little bit when cooking. Only a small portion would be wasted anyway.
- No → I tell others to consume rice responsibly like I do.
- Yes → It's okay to leave a little rice on my plate.

I tell others to consume rice responsibly like I do.
- No → I respect farmers for producing the rice we eat.
- Yes → I prefer to eat healthier rice, such as unpolished or brown rice and pigmented rice, and healthy rice-based products.

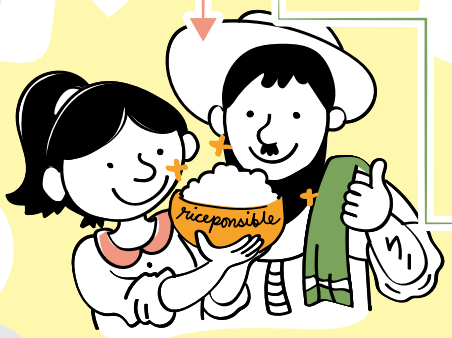
It's okay to leave a little rice on my plate.
- No → I prefer to eat healthier rice, such as unpolished or brown rice and pigmented rice, and healthy rice-based products.
- Yes → I prefer to cook more than what the family usually eats just in case someone wants to eat more. More is better than less.

I prefer to eat healthier rice, such as unpolished or brown rice and pigmented rice, and healthy rice-based products.
- Yes → I respect farmers for producing the rice we eat.
- No → I buy whatever rice is available in the store. It doesn't really matter whether it is imported or locally produced.

I prefer to cook more than what the family usually eats just in case someone wants to eat more. More is better than less.
- No → I buy whatever rice is available in the store. It doesn't really matter whether it is imported or locally produced.
- Yes → Everyone can be riceponsible.

I respect farmers for producing the rice we eat.
- Yes → Thank you for being riceponsible!
- No → I buy whatever rice is available in the store. It doesn't really matter whether it is imported or locally produced.

I buy whatever rice is available in the store. It doesn't really matter whether it is imported or locally produced.
- No → Thank you for trying to be riceponsible!
- Yes → Everyone can be riceponsible.



Thank you for being riceponsible!
Keep up the good work!

Thank you for trying to be riceponsible!
However, you might have to try harder.
We're rooting for you!

Everyone can be riceponsible.
You can be one, too!

Diversifying farms

PHOTO ESSAY BY JAYSON C. BERTO

Farm diversification has been a buzzword in promoting higher income and enhanced household food security for farmers, and sustainable and healthy food supplies for consumers. It has been more than a year since communities were on quarantine due to the infectious corona virus, yet Lupao Vegetable Growers Association (LVGA) farmers are non-stop in their farming activities.

The PAG-AHON or "Sa Palay at Gulay – May Ani, Hanapbuhay, Oportunidad, at Nutrisyon" project of DA-PhilRice, local government unit (LGU), and the East-West Seed company, under the DA's Plant Plant Plant Program, has educated more than 100 farmers and home gardeners on rice-vegetable production.

This is Lupao, Nueva Ecija today: the rising "pakbet" town in the province.

Jaime, 57, with his ready-to-plant Thai sili seedlings, is one of the recipients of shed, plastic mulch, seedlings, among other farm materials provided by the PAG-AHON project. LVGA farmers plant based on consumers' demand. For instance, NutriAsia, which is a new market link for them, requested supplies of Thai sili and sweet pepper.

Through the continuous support from the LGU and DA-PhilRice, more farmers were encouraged to diversify their farms. Henry Dela Vega Ramos, LVGA President, said that about 70 farmer-members were active in 2020 and around 40 new members have joined the association this year.

An aerial view of a close to 3,000m² diversified farm in San Antonio Weste owned by Jaime E. Idago. Assorted vegetables such as bitter gourd (ampalaya), Thai sili, and tomatoes were planted in the middle of Jaime's 9-ha rice fields.

"[I] cannot escape from vegetable farming. It runs in the blood," said Anna Liza A. Carig of San Pedro. She grew up in a farming family where as a child she would always tag along her father to do farm chores. She now manages their 2,000m² vegetable farm. She plants bitter gourd, tomatoes, eggplant, and Thai sili, and transports her produce to the LVGA hub for marketing. She sells some of her produce in the local market while securing supplies for her household.

Anna Liza is one of the farmers trained on vegetable production anchored on the Good Agricultural Practices.

EAST-WEST SEEDS

Dizon Farms is one of LVGA's clients. In 2020, the association supplied the company with about 17 tons of vegetables, which were sold to supermarkets nationwide.

HENRY RAMOS

LVGA also supplied around 3 tons of vegetables to the Ateneo de Manila University in the first quarter of this year.

VOX POP

What are your ways of ensuring a quality, healthy, safe, and sustainable rice-based food system in your communities amidst COVID-19?

COMPILED BY: CHARISMA LOVE B. GADO-GONZALES

Mayor Ma. Josefina "Joy" Belmonte
Quezon City

Food Share Rice and Goods Program with Department of Social Welfare and Development (DSWD) and GrowQC-Kadiwa Partnership

In partnership with the Department of Social Welfare and Development–NCR, Kabisig, and Reckitt Benckiser Healthcare Philippines, the QC Food Security Task Force and QC Social Services Development Department conducted the Food Share Program for three chosen barangays in Quezon City.

Through the program, rice subsidies were provided by Kabisig and various goods were turned over to the chosen barangay with urban farmers to encourage backyard home gardening and community urban farming in support of food security. The program aimed to provide food assistance to the most in need and affected by the COVID-19 pandemic.

Quezon City promotes empowered communities to help fellow QCitizens during the pandemic. It encouraged communities practicing urban agriculture to share their harvest; and in turn, receive rice subsidies.

QC LGU top officials led the turnover of rice subsidies and various goods to the urban farmers from Barangays Payatas, Bagong Silangan, and Botocan.

Furthermore, through the GrowQC-Kadiwa ni Ani at Kita partnership with DA, we were able to bring locally produced rice from farmer cooperatives in the provinces to QC residents at the height of the lockdown. By doing so, QC residents were able to purchase local quality rice at affordable prices. ▪

Mayor Richard Gomez
Ormoc City, Leyte

Capacitating farmers
Ormoc City recognizes the need for high-quality and safe rice production. This is due to the fact that the COVID-19 pandemic hampered rice production, affecting the supplies, farmers, and general public.

In partnership with the Technical Education and Skills Development Authority (TESDA) and accredited farm schools like Tenpuesto Farms, farmers and farm workers were trained for 14 days on the production of high-quality inbred rice seeds, seed certification, and farm mechanization.

Empowered by TESDA, accredited farm schools in Ormoc were established in different barangays to reach more farmers. This improved farm practices and enhanced efficient farm operations. With this initiative, rice and rice-based food systems in the Ormocanon community is ensured and sustained despite restrictions and difficulties brought about by the pandemic. Reports have attested to the sustainability and effectiveness of Ormoc's efforts and on the safe and high-quality rice we produce. ▪

ALL THE BEST FOR OUR JULY RETIREES

SARAH JOY N. RUIZ

LEO C. JAVIER, 64

of Narvacan, Ilocos Sur
Director I, Isabela Branch
Length of Service: 43 years

Javier earned his BS and MS in Agri-Engineering from UPLB in 1978 and 1985; and MA (Public Management), Ateneo de Manila University, in 2016. He strengthened the station's regional and national networks on inbred and hybrid rice production to improve the competitiveness of farmers in Cordillera and Region 2. As an expert in technology promotion, he led various major projects related to hybrid seed production and commercialization in Luzon and Mindanao.

He was a Chief Science Research Specialist (SRS) from 1995 to 2018, managing techno-demo farms mostly on rice varieties in more than 2,000 sites nationwide. With his technical expertise, sterling personality, and good management skills, he holds the record as the only official who had led almost all of the PhilRice stations — Negros, Agusan, and Midsayap, which resulted in improved linkages among stakeholders. He also helped establish the Mindoro satellite station.

From 1978 to 1995, he worked at the Philippine Tobacco Research and Training Center, which later became the National Tobacco Administration.

EMILY C. AROCENA, 60

of Science City of Muñoz, Nueva Ecija
Supervising SRS, CES, Plant Breeding and Biotechnology Division
Length of Service: 36 years

Arocena has a BS Agriculture (1984) and MS Crop Science (1995) from the Central State University. She started as a Research Assistant in 1985 at the Bureau of Plant Industry-Maligaya Rice Research and Training Center (now PhilRice CES). At DA-PhilRice, she was Science Research Analyst in 1989, SRS I in 1991; SRS II in 1994; Senior SRS in 1999; then Supervising SRS in 2014.

She led various projects such as breeding of specialty rice, development of irrigated lowland varieties, pre-breeding and development, and evaluation and identification of high-zinc rice breeding lines.

She is the principal breeder of 2 aromatic, 5 glutinous, and 5 pigmented rices, and co-breeder of 2 high-zinc varieties released for special purposes by the National Seed Industry Council. She developed 3 pigmented elite lines registered under the Plant Variety Protection and co-developed 19 full-fledged varieties for irrigated lowland, and one variety for cool-elevated areas.

These varieties and her publications as co-author contributed to her repeated recognition as Most Outstanding Research Staffer Level 2 in 2004, 2005, and 2010.

She now would just like to stay at home, set up a small garden for ornamentals and vegetables, and enjoy her retirement with her family and friends.

FE A. DELA PEÑA, 63

of San Jacinto, Pangasinan
Supervising SRS, Crop Protection Division
Length of Service: 40 years

Dela Peña has a BS Botany (1979), MS (1985), and PhD Forest Pathology (1992) from UPLB. She began her career in February 1980 as a Research Assistant at UPLB. She taught at the Mariano Marcos State University from 1986 to 1997; joined PhilRice in June 1997 as Senior SRS up to 2000, and retired as Supervising SRS.

She handled various projects and studies, acquired funds from international agencies, authored and co-authored technical publications and award-winning papers, and served as consultant and resource person to different organizations. She was designated as head of the Crop Protection Division for four terms.

VIRGILIO F. MUYET, 65

of Davao City
Farm Superintendent II,
DA-PhilRice Midsayap Branch
Length of Service: 40 years

Muyet has a BS in Agri-Engineering from the University of Southern Mindanao. He started his career in 1980 as Tracer at the National Irrigation Administration and was promoted to Draftsman I in 1982. He later joined DA as Integrated Pest Management Technician from January 1987 to February 1988. He became part of the Midsayap team as Engineer Aide and retired as Farm Superintendent II.

He supervised the station's motorpool. He provided technical assistance to the Business Development Unit by helping to carry out field operations from planning to implementation. He contributed in the management of seed yields through the results of his studies on postharvest handling and facilities. He exerted enormous efforts in ensuring the interest of the government was not compromised in performing his duties.

GOOD AGRICULTURAL PRACTICES

help ensure an environment-friendly way of producing rice and guarantee that the food we consume are safe and do not harm our health. A sustainable strategy, Good Agricultural Practices (GAP) also increase farmers' income. Contact your municipal/city agriculture office for GAP certification.

DEPARTMENT OF AGRICULTURE
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