

# PhilRice

A quarterly publication of the  
Philippine Rice Research Institute

# Magazine

# RICE FOR ALL

PART ONE

WHAT WE TALK ABOUT  
WHEN WE TALK ABOUT FOOD

CHASING BOUNTY: THE  
PHILIPPINES' JOURNEY TO  
RICE SELF-SUFFICIENCY

FIELDING SOLUTIONS

PUTTING UPLAND  
TRADITIONAL VARIETIES IN  
THE LIMELIGHT

POWER OF TWO OR MORE

DELIVERING SUPPORT  
AT HOME

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## ABOUT THE COVER

In the Philippines, one could easily equate food with rice. With more than 100M Filipinos eating rice at least three times a day, this comes as no surprise. Rice, to date, remains the staple food in the Philippines, making it one of the prized, highly debated commodities in the country. This issue showcases some of the government's research interventions under the Food Staples Sufficiency Program (FSSP) to help ensure availability of rice for all Filipinos. These undertakings constitute Part 1 of our special issue on FSSP.

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# the Rice Research Advantage



The Bureau of Agricultural Statistics asserts that Philippine rice production has jumped by 122% from 1987 to 2013.

Do you ever believe this just mushroomed from nowhere?

Research must have something to do with it!

Our older folks can vividly recall that before rice was of poor quality, not uniform, and yield was dismal. Farmers used to plant rice only once a year.

Today, farmers have hundreds of varieties to choose from— either long- or short-grained rices. Consumers and farmers alike can even choose the scent and color of their rice. Most importantly, farmers can choose to their satisfaction according to the yield potential of the varieties.

Do you think these things just mushroomed from nowhere? Or, with divine intervention perhaps?

Research and development must have something to do with them!

In 2013, the Philippines achieved the highest growth in milled rice production in all of Asia. We did not hear much about it, but we did it indeed!

Do you think this just mushroomed from nowhere? Research must have something to do with it! We reiterate. We stress.

Research and development. That's what the men and women of PhilRice do best. In this special issue of the PhilRice magazine, we feature the research projects funded under the *Food Staples Sufficiency Program* (FSSP) being implemented by PhilRice along with

partner institutions. These scientific studies are transdisciplinary in nature and cut across several dimensions of rice farming.

Under the FSSP, several studies on producing varieties that can sustain our increasing rice productivity have been funded and already they have yielded fruits. Many rice lines have advanced to the higher level of the breeding process.

The FSSP has also invested on studies to fast-track information delivery and retrieval. This takes advantage of the advances in information and communications technology so our rice producers are at par with the best in the world.

Investment on tracing the genetic identities of our rice varieties, especially the traditional ones, is also significant. Studies under this domain are extremely useful at a time when claims to life forms are at their peak—and this does not exempt rice varieties.

In this issue of the Magazine, we tell you how we are using the taxpayers' money for rice research and development. We explain to you the work that we do, and the results and impacts that we have thus far generated.

While we report success stories, we know better than to rest on our laurels. Like the clock, we keep going. We know that our numbers of success will pale as long as there are millions to feed, and that the threats to food production are not decreasing through time.

Geek work. Meticulous minds. Industrious bodies. We give it our all to unearth the secrets to producing more food and continuing on with it. Men and women of knowledge must not allow themselves to become people of inaction. ●

# New breed of extensionists graduate

A different kind of extension service can be expected from the pilot batch of 25 Luzon agricultural technologists and development officers who completed a 5-month training at PhilRice, 17 April.

Titled *Enabling the AgRiDOC: A new breed of rice extensionists*, the course did not only prime the AgRiDOCs (agricultural development officers of the community) as transmitters of technologies from research centers but as catalysts of farm community transformation.

The training program is a major component of the project *Improving Technology Promotion and Delivery through Capability Enhancement of Next-Gen Rice Extension Professionals and Other Intermediaries* (IPaD).

PhilRice's Dr. Karen Eloisa T. Barroga, project lead, explained that an AgRiDOC

has a broader and more active role in the development process, a renewed capacity and attitude in performing their usual roles, and a new set of knowledge and skills to deal with current and future challenges in agriculture.

"When they return to their offices and communities, we expect them to initiate projects that will make rice-farming communities competitive, sustainable, and resilient. That is why we have extended their knowledge on mainly rice to rice-based farming systems, with an entrepreneurial mindset," Barroga said.

Conducted at the PhilRice Central Experiment Station from 19 Nov 2014, the training was one of the steps being taken to help revitalize the devolved rice extension system. A second batch of trainees from the Visayas and Mindanao will start its program in June 2015.

Regular course offering is expected to start in 2016 and will target 5-7 AgRiDOCs in the major rice-producing provinces.

The training program is funded by the DA-National Rice Program through the Bureau of Agricultural Research, and is being implemented by PhilRice, IRRI, and Agricultural Training Institute. IPaD is a project under the *Food Staples Sufficiency Program - DA-IRRI* collaboration on Rice R&D.

| **CHARISMA LOVE B. GADO**

# Agri research gets more funds

The Department of Agriculture (DA), through the Food Staples Sufficiency Program (FSSP), has increased its investments on public agricultural research.

The program, which covers rice, white corn, *saba*, cassava, and sweet potato, implements projects aiming for adoption of yield-enhancing technologies, increasing income, and improving delivery of extension and research services.

Dr. V. Bruce J. Tolentino, IRRI deputy director general for communications and partnerships, said the rate of return to agricultural research in general exceeds 40%. Specifically, rice research worldwide gives a benefit of US\$1.46 billion per year, boosting rice yields by an average of 11.2%.

Since 2012, government budget for rice R&D had amounted to P800-900 Million or about 12% of the total budget of the National Rice Program.

FSSP initiatives include cross-country research, associated technologies, and rice crop manager, an ICT-based technology that provides a decision-support tool that can be accessed by computer and mobile phone to increase yield and income of farmers.

Project implementers are also monitoring rice-growing areas in Asia, developing next-generation rice varieties, raising productivity and enriching the legacy of heirloom rice, and enhancing the capacity of the next generation of farmer-intermediaries and rice extension professionals.

Recognizing the partnership between DA and IRRI since the first green revolution, Tolentino acknowledged DA's capability and the ability of scientists to communicate with PhilRice and other attached agencies as "unparalleled." | **MARY GRACE M. NIDOY**



# Rice agritourism site being developed

PhilRice, through its FutureRice Program, is tapping the potential of agricultural attractions in developing a rice agritourism site showcasing conventional and practical cutting-edge technologies in rice farming.

In the 14-15 April *Lakbay Palay*, farmers learned about the technologies used in the FutureRice farm such as nutrient diagnostic tools including the Minus-One Element Technique (MOET) calculator and Rice Crop Manager App; machines and monitoring systems such as Field Water Monitoring and Control System (FWMCS), and the Automated Field Monitoring Station (AFMS). The site also uses clean and renewable energy including the solar-powered water pump and biogas digester that provide alternative fuel from animal wastes.

The farm likewise showcases hybrid rice varieties such as Mestiso 19 and 20, rarely seen traditional varieties, aromatic, and submergence-tolerant rices, the farmers' variety called 'double diamond', and Korean varieties.

"Our objective is to prepare Filipino farmers and extension workers for the future rice farming scenarios and train them on clean, green, practical, and smart rice farming," said Roger Barroga, program lead.

The 5-ha farm site within the Central Experiment Station provides education, exposure, and experience to rice farmers and extension workers through training, site visits, and agricultural events.

"This year, in cooperation with the Project IPaD, we developed a portion of the farm as a rice boot camp and hosted the season-long training of 25 AgRiDocs or the new breed of extension workers. The rice boot camp included plots for rice production," Barroga added.

Although visitors have to travel 3-5 hours from Metro Manila, Barroga said they will be relaxed with agricultural adventures such as rice planting, harvesting, and recreational activities such as boating, fishing, and kayaking.

| **MARY GRACE M. NIDOY**

# Agri-scientist is Gawad Saka Awardee

PhilRice's Dr. Ricardo F. Orge, Scientist I and Coping with Climate Change Program lead, is the DA's 2015 *Gawad Saka* Outstanding Agricultural Scientist for Central Luzon.

Orge has been involved in applied research, particularly the development of engineering technologies, mostly machines that would help enhance the productivity of farmers and their resilience to climate change during his now more than 20 years of work. The agricultural engineering graduate from Visayas State University was conferred as Scientist I in 2009. He developed the Continuous-type Rice Hull (CtRH) Carbonizer, a machine used as an alternative and improved system of processing rice hull into biochar (carbonized rice hull), (cont. p4)



To go through a different "rice experience," visitors may contact the PhilRice Visitors and Conference Services Office for tour schedules and reservations (044) 456-0258 local 526/527 or email [prii.mail@philrice.gov.ph](mailto:prii.mail@philrice.gov.ph).



Agri scientist... (cont. from p3) together with various carbonizer attachments for recovering the generated heat: high-volume cooker, baking oven, sterilizer for mushroom fruiting bags, and Poultry Heating System that uses the CtRH-generated heat for brooding chicks, an alternative to the existing LPG-fueled heaters.

“Studies worldwide proved that biochar is a powerful tool to address some of the most urgent environmental problems

of our time: global warming, soil degradation leading to food insecurity, water pollution by agro-chemicals, and waste management,” Orge said.

The carbonizer-attached High-Volume Cooker is now being pilot-tested by farmers in Bulacan and Aurora.

“It was developed for farmers who want to sell cooked agricultural products (*nilagang mais*, *saging*, *mani*, etc.) along national/country

roads or for operators of carinderias. Blueprints are now being finalized for its commercialization together with the CtRH carbonizer,” Orge said.

Other machines co-developed by Orge include the Microtiller, Rice Flourmill, and Seed Treating Machine.

Orge, 54, a son of Merida, Leyte, finished MS Agricultural Engineering at UP Los Baños and PhD in Energy Engineering at UP Diliman. | **MARY GRACE M. NIDOY**



(Left to right) Dr. Ricardo F. Orge, Dr. Manuel Jose C. Regalado, and Engr. Eden C. Gagelonia receive awards during the 65th PSAE Annual Convention.

## PhilRice engineers honored

The Philippine Society of Agricultural Engineers (PSAE) recognized PhilRice engineers for their outstanding contributions in their respective fields of expertise during the 65th PSAE Annual

Convention held in General Santos City, 19-25 April.

PhilRice Acting Deputy Executive Director for Research Dr. Manuel Jose C. Regalado

was the Most Outstanding Agricultural Engineer (Maramba Award), the highest recognition given during the event.

Dr. Ricardo F. Orge, Coping with Climate

Change Program lead, was Outstanding AE in Environmental and Waste Management.

DOST-conferred scientists Regalado and Orge also are Central Luzon's Gawad Saka Outstanding Agricultural Scientists in 2014 and 2015, respectively.

Regalado leads research studies on renewable energy, farm machine development, and wind-pump system. Orge, on the other hand develops machines that help enhance the productivity of farmers and their resilience to climate change.

Engr. Eden C. Gagelonia, Farming without Fossil Energy Program lead, was Outstanding AE in Postharvest and Agricultural Technology Processing.

The former division chief of the Rice Engineering and Mechanization division head is currently developing and fine-tuning the 8-row riding-type precision seeder. | **JOHN GLEN S. SAROL**

## Other winners

- *Development and pilot-testing of a local riding-type transplanter* (Arnold M. Juliano, and Joey P. Miano) **FIRST PLACE** - Machinery and mechanization category.
- *Energy efficiency, cost effectiveness, and productivity of rice under rainfed conditions with improved tillage and direct seeding method* (Regalado, Christian Paul M. Ariola, and Kristine S. Pascual) **FIRST PLACE** - Soil and water conservation category.
- *Water productivity and yield performance of rice under different irrigation regimes in irrigated lowland environment* (Arjay P. Sabasaje, Kristine S. Pascual, Filomena S. Grospe, and Evangeline B. Sibayan) **FIRST PLACE** - Irrigation and water management category.
- *Enhancing soil water productivity for upland rice through CRH application* (Noel D. Ganotisi, Meljoy R. Gappi, and Lester O. Quigao) **FIRST PLACE** - Technical poster presentation.
- *Influence of length of rice straw on gasification rate and producer gas heating value* (Paulino S. Ramos, Arnold R. Elepano, Jessie C. Elauria, Delfin C. Suministrado, and Manuel Jose C. Regalado) **SECOND PLACE** - Waste utilization category.
- *Development of a locally adapted and manufactured ride-on precision seeder* (Eden C. Gagelonia, Harvey V. Valdez, John Eric Abon, and Leo B. Moliñawe) **SECOND PLACE** - Machinery and mechanization category.
- *Evaluation of low-cost drip irrigation system (LDIS) for rice-based high-value crop production* (Noel D. Ganotisi, Moises G. Galera, Mark Lester O. Quigao, and Reynaldo C. Castro) **THIRD PLACE** - Technical paper presentation; **THIRD PLACE** - Best poster, Soil and water conservation category.

## 17<sup>th</sup> Annual Scientific Meeting and Symposium of the Mycological Society of the Philippines winners

- *Plant disease suppression by a plant-symbiotic fungus (*Epichloë festucae*) depends on its ability to produce an antifungal compound* (Jennifer T. Niones and Daigo Takemoto) **BEST ORAL PAPER**
- *Inhibitory Effects of Fungal Endophytes and Bacterial Isolates on Tubers of *Cyperus rotundus* L.* (Amelita T. Angeles, Femia R. Sandoval, Dindo King M. Donayre, and Nenita V. Desamero) **BEST POSTER**



## PhilRice researcher is 2015 Marcos R. Vega Memorial Awardee

Dindo King M. Donayre of PhilRice's Crop Protection Division is this year's recipient of Marcos R. Vega Memorial Award in Weed Science, given during the 46<sup>th</sup> Anniversary and Annual Scientific Conference of the Pest Management Council of the Philippines, Inc held at Grand Regal Hotel, Davao City, May 5-8.

Donayre and Lucille T. Minguez of Northern Mindanao Integrated Agricultural Research Center (NOMIARC), Malaybalay City, Bukidnon, also bagged the best paper award with their study — *Histopathology of Puccinia philippinensis Syd. & P. Syd., A Potential Biological Control that Causes Leaf Rust Disease to Cyperus rotundus L.*



WHAT  
WE TALK  
ABOUT  
WHEN WE TALK ABOUT  
FOOD

MARY GRACE M. NIDOY



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So much is at stake when we talk about the most basic need of humanity. Throw in the producers, consumers, stakeholders, and decision makers, and figure out the complex and elaborate process of providing food for everyone in a country with a ballooning population.

Food, after all, is entrenched in the agricultural, psychological, economical, and yes, even political consciousness of Filipinos.

The brains behind the *Food Staples Sufficiency Program* (FSSP) of the Department of Agriculture (DA) knew that it was a dynamite of a challenge and grand plan to undertake. Four years since its well-thought-out and coherent inception, with hits and misses along the way, where does FSSP stand now? Why did the government embark on a large-scale and ambitious agenda? We take you back where it all began.

### **FSSP'S FOUNDATION**

Agriculture Secretary Proceso J. Alcala recognized the need to "rethink development strategies and focus on agriculture development" after the food crisis in 2007-2008. The crisis caused exporting countries to ban exports, resulting in rice shortage and price hikes, which badly affected consumers in developing countries. Worse food crises erupted in 1972-1975 when a large-scale El Niño cast long dry spells all over Southeast Asia. Rice price then in the world market skyrocketed, Thailand banned rice exports, oil prices spiralled leading to more expensive production inputs, and the world rice market disappeared for 9 months.

Conspiring challenges are our growing population, rising per capita demand for staples, raising farmers' productivity, increasing technology adoption, ASEAN economic integration, enhancing economic incentives, delivering extension and research services, and many others.

In 2011, the DA launched its flagship FSSP anchored on the farmers' welfare – improving their farm productivity and making them globally competitive. Under the *AgriPinoy* framework, the program covered rice and other staples such as white corn, banana (*saba*), and root crops such as cassava (*kamoteng kahoy*), sweet potato (*kamote*), and traditional alternatives.

Proclaimed main target was to produce our domestic requirements by 2013. With FSSP, the national government opted for food self-sufficiency – "satisfying domestic requirements for food, seeds, processing, and feeds through local production."

To achieve self-sufficiency, FSSP strategies and interventions were to raise productivity and competitiveness; enhance economic incentives and enabling mechanisms; and manage food staples consumption.

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## RICE SELF-SUFFICIENCY

Without undermining the importance of other staples, rice as the country's main food became the focus of the program. Some 96 million of the more than 100M Filipinos eat rice at least thrice a day. The program targeted 100% sufficiency in rice – a goal feared by analysts and experts as “ambitious” and “unrealistic.”

With 2013 declared as National Year of Rice, DA claimed that the Philippines reached 97% sufficiency level despite the natural calamities including the strongest typhoon in history, *Yolanda*.

Just like any other program, FSSP had hits and misses along the way.

When the FSSP was crafted, 119 kg was the annual per capita consumption; in 2013, the Bureau of Agricultural Statistics (BAS) pegged it at a lower 116.48kg.

In 2014, according to BAS, total paddy production was about 19 M tons; harvested area was 4.7 M ha; and average rice yield was 4.0 mt/ha.

While the DA is fine-tuning its policies, the government's efforts toward self-sufficiency in rice remain.

So, why still target rice self-sufficiency?

PhilRice senior economist Dr. Flordeliza H. Bordey has answers.

“First, rice will stay as staple food in the Philippines. Its production and marketing remains an important source of income among rural households,” says Bordey.

She also points out that supply in the world market is volatile due to thin volume of traded rice. Only a few countries, including Thailand, control a significant chunk (80%) of the world's total export volume.

“This makes the importing countries vulnerable to the political trade decisions of the top five exporting countries. Export bans are common whenever there is a world crisis. It is therefore best for us to produce our own rice,” Bordey argues.

It was in 1979 that the Philippines, for one fleeting yet shining moment, attained self-sufficiency. Only 48 M people had to be fed

then. Only 2.4 M Filipino rice farmers are tilling an average farm size of 1.14 ha, as reported by Dr. V. Bruce J. Tolentino, IRRI deputy director general.

“So if you think about it, the problem ought to be worse. We're actually doing fine. Another 1% or 2% import is actually fine relative to the number of people we're trying to feed,” said Tolentino.

## FSSP'S RICE R&D COMPONENT

Challenges – new and continuing – need to be addressed now than ever before. Along this line, FSSP recently underwent a policy shift, refocusing the government's interventions on farmers' competitiveness, increase in income, and climate change resiliency.

What more could be done?

The DA has set new initiatives in the rice research component of FSSP in partnership with IRRI and public agencies to ensure food security in the Philippines. Anchored on shared objectives, the investment paved the way for seven research projects.

The Heirloom Rice project aims to enhance the productivity and enrich the legacy of traditional rice varieties by empowering indigenous communities in the Cordilleras, Arakan Valley Complex in North Cotabato, and Lake Sebu in South Cotabato.

To fast-track the development and field-testing of next-generation, high-yielding, and climate change-ready rices such as drought, saline, and flood-tolerant varieties, the Next-Gen project was born. It will use new methods of speeding up adoption through multi-environment testing.

For direct-seeded rice in irrigated and rainfed ecosystems, *Accelerating the development and dissemination of resource-efficient technologies for rice production* aims to develop and disseminate appropriate crop and water management technologies and mechanization to increase production.

New ICT decision-support tools are also being developed such as the Rice Crop Manager and PRISM or Philippine Rice Information System, to monitor rice-growing areas toward increased production. As of 2014, the

Rice Crop Manager and Rice Doctor have disseminated about 293,000 recommendations to individual rice farmers.

PRISM's monitoring system uses remote sensing, cloud computing, and smart phone-based field surveys to gather and analyze information on rice.

A new curriculum in agriculture for extension intermediaries is being pilot-tested under Project IPaD (*Improving technology promotion and delivery through capability enhancement of the next-gen of rice extension professionals and other intermediaries*).

With 25 participants from Luzon, the future AgRiDOCs (Agricultural Development Officers of the Community) are being primed to become catalysts of farm community transformation. They completed the course in April 2015. That for Visayas and Mindanao will start in June 2015. Other intermediaries, such as those in the private sector, are also being engaged and equipped to have more partners for extension services and advisories. Enabling mechanisms are being enhanced and facilitated to strengthen the rice extension system, such as access to non-degree scholarships and ICT-based tools and resources.

Another initiative involving cross-country research aims to assess the competitiveness of Philippine rice relative to those of selected rice-producing countries in Asia. The study aims to examine and compare government policies, rice yields, input use, marketing practices, costs of producing and marketing commercial rice, and hybrid rice seeds.

DA Assistant Secretary and PhilRice Officer-in-Charge Edilberto M. De Luna hopes the new investment in rice R&D will lead the industry to a higher level of competitiveness, climate change resiliency, and alleviate poverty in the farming communities, and make the Philippines food-sufficient.

What's clear with the current administration is that FSSP will keep on. Perhaps, with a new president in July 2016, what we will talk about when we talk about food will be entirely a different ball game. ●

# CHASING BOUNTY

## THE PHILIPPINES' JOURNEY TO RICE SELF-SUFFICIENCY

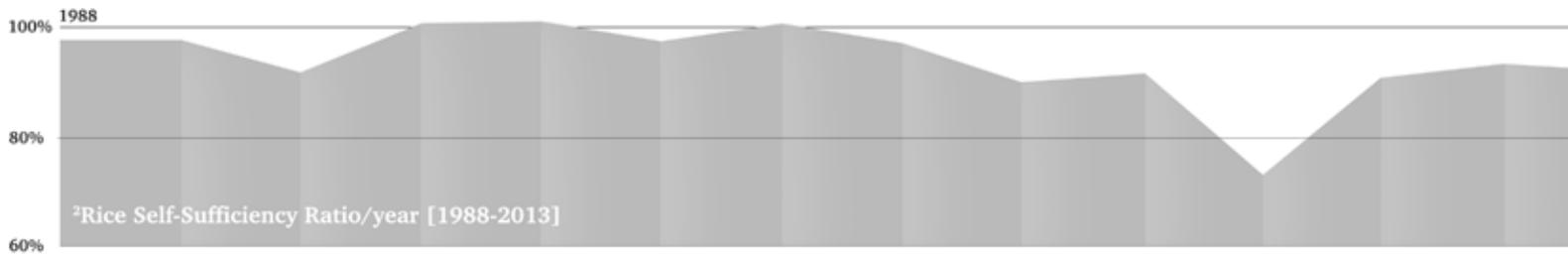
- MARLON M. PRADO -

This article is based on a paper titled "Understanding Rice Self-Sufficiency in the Philippines" by Dr. Flordeliza H. Bordey of PhilRice, which she presented during the 26th National Rice R&D Conference, 4-5 September 2013 at PhilRice Central Experiment Station in Nueva Ecija. The paper has more details on our strategies to achieve rice self-sufficiency.

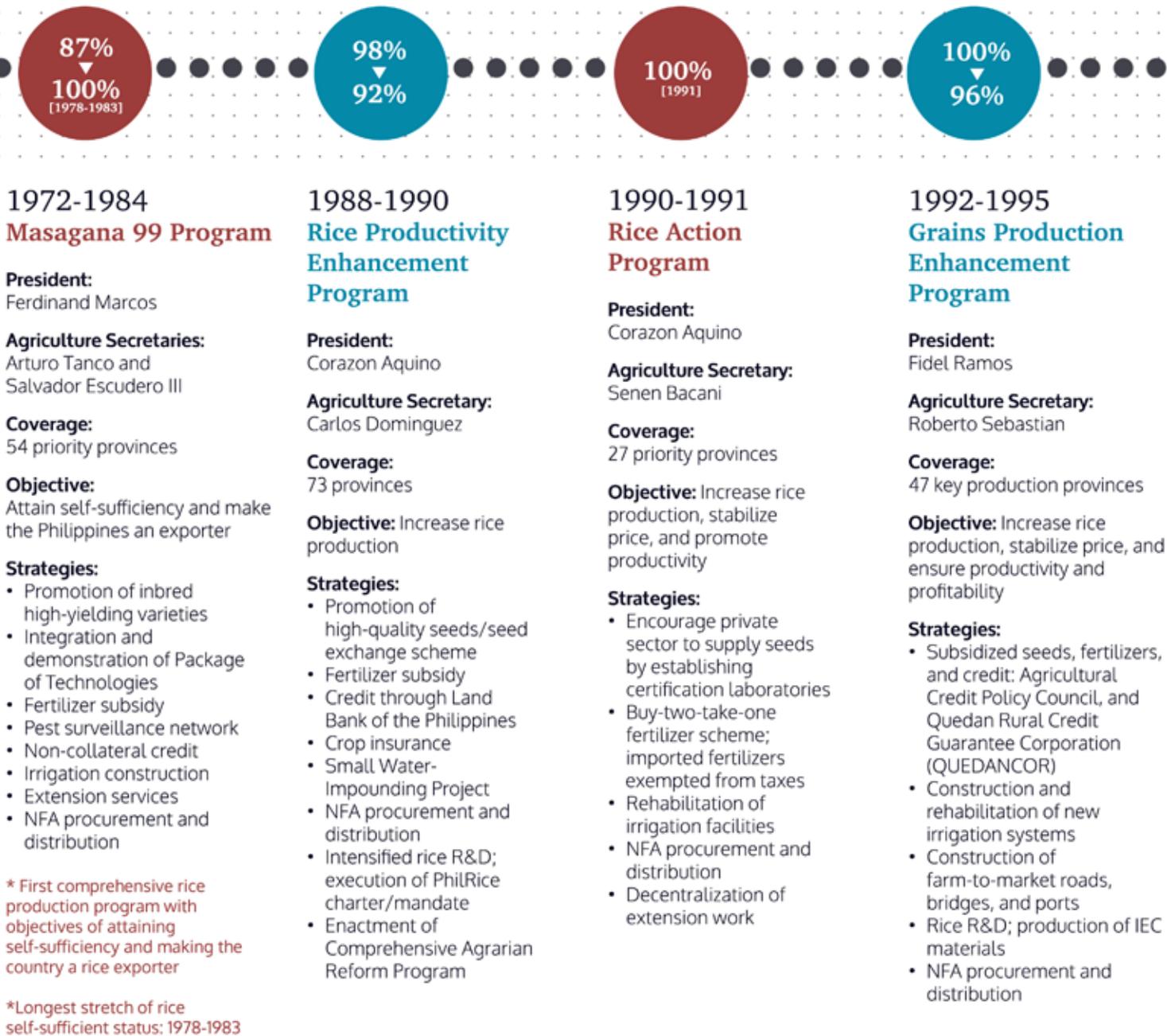
Food security has been top priority of the agriculture sector for decades; and rice, being a huge part of the Filipino's daily diet, has been given the utmost attention. In 2012, the government invested P61 billion in agriculture as its budget to secure food for every Filipino.

Over the years, the demand for rice increased: in 2012 more than 2 million families earned their household income from rice farming<sup>3</sup> and about 32% of the country's total agricultural lands were devoted to rice<sup>4</sup>; rice intake increased by about 26% from 92.53 kg per capita in 1990 to 116.48 in 2013<sup>2</sup>; and the volume of produced rice jumped by about 122% in 2014<sup>2</sup> since 1987.

The country hit 94% rice sufficiency in 2011, the highest sufficiency ratio since 1995 with 96%, and a 16% leap from 2010's 81% ratio<sup>2</sup>. Official population figure in 2010 was only 92.34 million, 2.01 M shy from the forecasted 94.35 M of the Food Staples Sufficiency Program<sup>5</sup> (FSSP). The data further correlated with the lower per capita rice consumption in 2010 at 115 kg/year. All these data were promising.



## <sup>1</sup>Philippines' rice production programs from 1972-present:



At the end of 2013, the Philippines was 97% rice-self-sufficient, 3% short from the FSSP target in 2010. Keeping it in perspective, this is a milestone in the rice sector. It is the best self-sufficiency status the country has ever reached since 1995, despite the 25 storms that thumped the country, including super typhoon Yolanda. Production was more than 18 million metric tons of palay – a

great feat nonetheless. Yet, well-milled rice price began to spike once again to as high as P39.34/kg by the end of 2013<sup>2</sup>.

The road to rice self-sufficiency has never been this vivid. The 12 celebrated years only prove that while rice self-sufficiency is elusive, it is no longer a dream. The better question now is, at what cost? •

89%  
▼  
91%

## 1996-1997 Gintong Ani Program

**President:**  
Fidel Ramos

**Agriculture Secretary:**  
Salvador Escudero III

**Coverage:**  
All rice-producing provinces

**Objective:** Stabilize price, transform farmers into entrepreneurs, and enhance farm income

### Strategies:

- Removal of seed and fertilizer subsidies
- Soil analysis
- Integrated Pest Management/Farmers' Field School training
- Construction of Small-Scale Irrigation Systems
- Promotion of postharvest technologies
- Credit and crop insurance thru Land Bank of the Philippines
- NFA procurement and distribution
- Enactment of the Agriculture and Fisheries Modernization Act (AFMA)

70%  
▼  
93%

## 1998-2000 Agrikulturang MakaMASA Program

**President:**  
Joseph Estrada

**Agriculture Secretaries:**  
William Dar,  
Edgardo Angara, and  
Domingo Panganiban

**Coverage:**  
All provinces

**Objective:** Reduce poverty incidence, increase farm income, ensure sustainability, and empower people

### Strategies:

- No seed & fertilizer subsidies
- Small-Scale Irrigation Systems
- Promotion of balanced fertilization
- Farmers' Field School and retooling of agricultural technologists
- Business information database
- NFA procurement and distribution

93%  
▼  
81%

## 2001-2010 Ginintuang Masaganang Ani (GMA) Rice Program/FIELDS

**President:**  
Gloria Macapagal-Arroyo

**Agriculture Secretaries:**  
Leonardo Montemayor,  
Luis Lorenzo, Arthur Yap,  
Domingo Panganiban, and  
Bernie Fondevilla

**Coverage:** All provinces

**Objective:** Achieve rice self-sufficiency and generate more employment

### Strategies:

- Seed subsidy (hybrid and inbred)
- Seed producer assistance
- Fertilizer subsidy
- Extension intensified (farmers, seed growers, agriculture technologists, trainers, and rice specialists)
- Construction and rehabilitation of national and communal irrigation systems
- Postharvest facilities and farm equipment provision
- Credit/loans to eligible irrigators' associations
- NFA procurement and distribution

81%  
▼  
94%

## 2010-Present Food Staples Sufficiency Program (AgriPinoy)

**President:**  
Benigno Aquino III

**Agriculture Secretary:**  
Proceso Alcala

**Coverage:** All provinces

**Objective:** Rice self-sufficiency by 2013 and sustaining it thereafter

### Strategies:

- Construction of quick-gestating irrigation systems
- No seed & fertilizer subsidies
- Community seed bank
- Distribution of postharvest facilities and farm machinery
- Intensified promotion of integrated crop management through training and IEC dissemination
- NFA procurement and distribution
- Staple diversification

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Farmers have the tendency to resist new technologies being introduced to them. But when it comes to variety, they seem to anticipate what's next to become available. As the farmers' curiosity and demand for rice shoot up, the persistent effort to develop new varieties remains a challenge to the rice R&D sector.

## HYBRID RICE

The DA first executed the hybrid rice commercialization program in 1998 to address the demand. Hybrid rice technology became a full R&D program of PhilRice afterwards. The technology has since provided Filipino farmers with higher yields, saved land for agricultural diversification, and created rural employment opportunities. With 15-25% yield advantage over superior inbred varieties, the technology has a very good potential to improve the rice sufficiency

level of the country despite the country's limited arable land, expanding population, and unfavorable or unstable climate conditions.

Balbino Alingalan of Banaybanay, Davao Oriental has been a hybrid rice farmer and seed grower since early 2000s. He says farming that generates better yield and income starts with better seeds. He was earning P20,000-P30,000 per ha in his early years of farming. After his shift to hybrid seeds, his earning has trebled.

"The excess from our income in hybrid rice farming enables us to diversify and venture into hybrid seed production," said Alingalan.

Hybrid rice is a product of two genetically diverse and superior parents as a result of crossbreeding. It has the so-called heterosis or hybrid vigor responsible for its phenotypic (observable traits or characteristics) advantages over inbred varieties. In some cases during its production, a certain divergence or phenomenon occurs often referred to as transgressive segregation.

Transgressive segregation results when the progeny or the descendant plant or plants contain new combinations of multiple genes with more positive effects (or more negative effects), for a



# NEXT

## THE Transgressive Segregation

quantitative character, than those present in either parent.

### TRANSGRESSIVE SEGREGANTS

In his research *Identification and selection of transgressive segregants from Philippine-released hybrid rice varieties*, Dr. Sailila

Abdula of PhilRice Midsayap identifies these segregants by comparing the mean performances of each progeny and of their parental lines in a similar environment or nursery.

"In this study, we are using F4 pedigree lines from the segregating nursery. The progeny seeds were carefully collected from the

selected plants of 2014 dry season and were advanced to the preliminary yield trials (PYT) at PhilRice Midsayap, Negros, and CMU," said Abdula.

The novelties of the progenies will be used to develop varieties that will produce equal or higher yields than F1. In fact, 7 of the 48 lines of PhilRice-released varieties selected for PYT in 2014 exhibited equal or better yields relative to the F1. More studies will be conducted.

The DA's *Food Staples Sufficiency Program* (FSSP) is faced with the challenge of responding to the increasing per capita rice consumption of the growing Filipino population. With it, the agriculture sector needs to step up on its R&D

investments to develop new rice varieties that will surpass the current average rice yield. The study on transgressive segregants poses a promising role on this concern and in making the rice industry a competitive venture.

"Our study on transgressive segregants is still in its early stages as evaluations for biotic and abiotic stresses of these lines are being undertaken. If the study succeeds, we will have future rice varieties that have better yields and stronger tolerance to stresses," Abdula said.

Under FSSP, rice self-sufficiency entails covering the annual per capita consumption of 115 kg while still providing for the 90-day buffer stock requirement. With 67 NSIC-approved hybrid varieties averaging 10 tons per hectare, the government is intensifying the usage of hybrid rice together with the private companies. ●

# TRANSgressive Segregants

ASHLEE P. CANILANG



# BRIDGING THE GAP

Hastening the development of and easing farmers' access to Next-Gen rice varieties

ANDREI B. LANUZA

How long does it take to conventionally breed new rice varieties? Three years? Maybe five? It can actually take 11 years. With 100 million or so population, frequent typhoons, erratic changes in temperature, aggressive and more potent rice pests, and other climate change-related challenges threatening food security, things just keep getting complicated for rice production. For farmers, 11 years is a wait too long just for researchers and scientists to develop a new variety that can cope with a few of these problems.

To bridge the proverbial gap between rice production, farmers, and consumers, PhilRice, IRRI, UPLB, and the DA-RFOs have joined efforts to fast-track rice development and accessibility.

This collaboration tackles two challenges, the first of which is shortening the breeding time for new and better rice varieties. Conventionally, it takes at least 6 years of breeding work, 3 years of testing, and 2 years of commercial seed production before farmers can plant a new variety. The second challenge is making the seeds accessible to rice farmers.

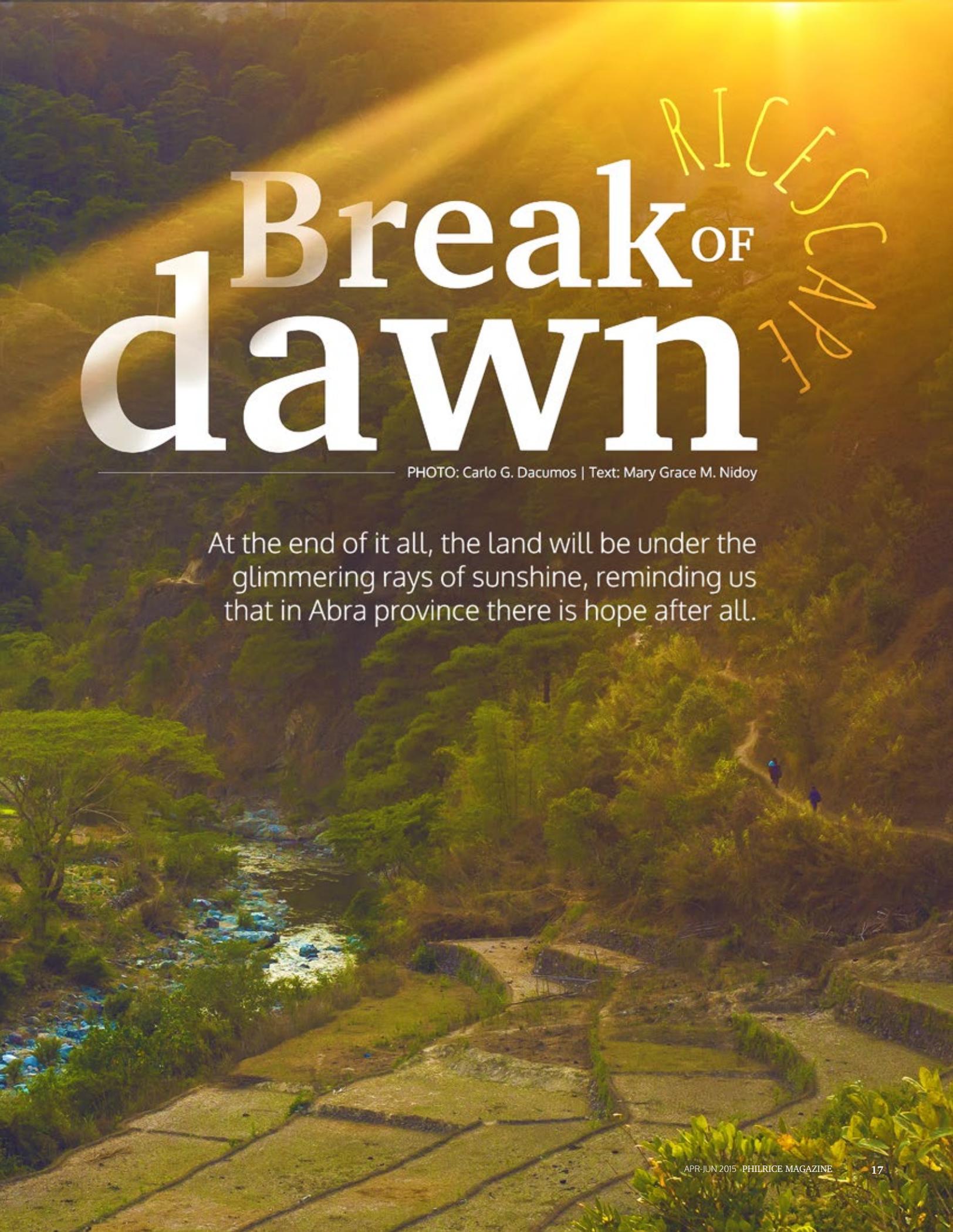
The project "Accelerating the development and adoption of Next-Generation (Next-Gen) rice varieties for the major ecosystems in the Philippines" aims to take on these challenges by producing new inbred and hybrid rice varieties faster. Among other goals, it also upgrades PhilRice's capabilities in plant breeding and molecular techniques, adaptive research, and seed production and health.

While most of the breeding work under the project is being done in Nueva Ecija and Laguna, the multi-location trials will be done in all major irrigated and rainfed rice-growing regions in the country under the supervision of DA-RFO's and state colleges and universities. Adaptation trials are to be carried out in farmer-partners' fields.

The first component of this project was anchored on the *Rice Self-Sufficiency Plan* (RSSP) in 2010-2013, while the second is under the *Food Staples Sufficiency Plan* (FSSP) from 2014 to 2016. In 2014, PhilRice strongly supported IRRI in the conduct of the multi-environment testing (MET) and national cooperative tests (NCT). The project wants to make available the seeds of next-gen varieties required in the PVS-techno demo trials under the FSSP.

According to PhilRice's Thelma Padolina, yield trials in farmers' fields will help them see how improved varieties perform in their area. The second component of the project is implementing a new stratified MET for early generation to improve the quality of materials going through the NCT. As of December 2014, the PhilRice-IRRI breeding team has nominated 766 entries for MET. During the 2014 wet season, 10 of PhilRice's most promising entries for stage 2 MET were elevated to the NCT for the dry season in 2015. Eight lines are being tested under transplanted and direct wet-seeded irrigated lowland and two aromatic lines under the special rice category. •





# Break <sup>OF</sup> dawn

RICES CAPT

PHOTO: Carlo G. Dacumos | Text: Mary Grace M. Nido

At the end of it all, the land will be under the glimmering rays of sunshine, reminding us that in Abra province there is hope after all.

# PUTTING UPLAND TRADITIONAL VARIETIES

HANAH HAZEL MAVI B. MANALO

IN  
THE

LiM

Do Philippine traditional rice varieties (TRV) suffer from identity crisis, too? If these varieties cultivated by upland farmers are stuck in this crisis, exporting them could be a futile attempt.

“As Filipinos having a sense of history and heritage, we should know what TRVs we have and claim what we own,” said Loida M. Perez, the lead proponent of the 3-year project “*Profiling and seed purification/multiplication of selected traditional rice varieties in support of the Department of Agriculture’s initiative for exporting quality rice*”, funded by the DA Rice Program, which started in 2013.

The DA’s initiative on TRVs is one of the main interventions in harnessing the

potential of the uplands to raise farmers’ productivity and global competitiveness on which the *Food Staples Sufficiency Program* is anchored.

Perez, head of PhilRice’s Genetic Resources Division, explained that Philippine TRVs are known by their unique names such as *Milagrosa*, *Kamuros*, *Inipot-ibon*, *Kalinayan*. Across regions, some TRVs have similar names although their physical features and quality may differ.

For example, Perez said, it is possible that the *Milagrosa* in Palawan might be different from that of Albay’s. Furthermore, she said that from the 20 TRVs that her group collected, each variety showed 2-7 types based on physical grain features that

resulted in more than 100 types identified. The presence of mixtures in rice grains of one variety could be the consequence of farmers’ no access to technologies on high-quality seed production.

## FINGERPRINTING

Confronted with this dilemma, Perez said there’s a need to determine the genetic fingerprints of TRVs with the use of molecular markers to establish their true identity. In breeding rice, these markers are used to spot the position of a particular gene indicating the presence of a desired characteristic such as aroma and color.

According to Perez, profiling TRVs is geared toward the establishment of their Plant

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# MELiGHT



Variety Registry under the Plant Variety Protection Office (PVPO) of the DA-Bureau of Plant Industry (DA-BPI). Their characteristics will be used in 'defensive protection' against misappropriation under a competitive international market. This will help increase the profitability of upland rice farmers and make them globally competitive.

Thus far, 41 TRVs nationwide have been comprehensively profiled looking into their agro-morphological characteristics, reactions to pests and diseases, grain quality, nutritional value, health-promoting properties, DNA fingerprints, and sequence of grain quality genes. The PhilRice Genebank has 6,000 accessions of Philippine

TRVs but the project prioritizes the most preferred or popularly grown varieties owing to the costly profiling process.

## **EXPORT POTENTIAL**

Assistance to our upland rice farmers does not end with profiling. "We can encourage them to continuously cultivate TRVs through market and product development. We have initiated a market scanning research of premium TRVs to determine their traits and qualities in demand by the export market. This way, we will be able to identify which of our quality TRVs can compete in the international market," Perez said.

This endeavor is in response to farmers' inadequate knowledge of the local and international markets and their limited skills in producing, processing, storing, and marketing high-quality, and pure seeds. Once these gaps are addressed, the potential of TRV production as a lucrative livelihood will be recognized by the upland rice farmers. They have long experienced low crop productivity at 1-2 t/ha and low income, making them the most neglected in agricultural development and the most vulnerable to food insecurity.

"Once the genetic identities of our TRVs are established, there will be a stronger support to claims by Filipino upland farmers that their varieties indeed originated from here," Perez concluded. ●

## FROM THE BASIC

To meet rice demand, *palay* production is targeted at 22.73M mt by 2016 to feed more than 100 million people. Among the government's interventions is to sustain R&D of new varieties and crop management techniques. This strategy projects yield increase of 4-5 t/ha for inbred and 6-7 t/ha for hybrid rice in less favorable rice areas. PhilRice sees high-quality seeds as central to meeting the demands of food security and keeping pace with the fast-changing environment.

According to Emily Arocena, PhilRice plant breeder, high-quality seeds of good varieties play a huge role in achieving higher yield. With proper crop management they contribute 5-10% yield increase.

## THE COMBO RICE

According to the *Food Staples Sufficiency Program*, rainfed areas contributed 27%

increase in rice production in 2000-2010. Generally speaking, farmers working in rainfed areas are poorer than those in irrigated farms.

PhilRice geneticist Loida M. Perez and team, funded by DA-RFO 3, assessed the potential of varietal mixtures to enhance yield in rainfed lowland and upland rice fields in barangays. Umiray and Caragsakan in Dingalan, Aurora. The province has a Type II climate with no dry season, with very pronounced maximum rain period from December to February. Rainfall occurs in March to May.

Varietal mixture is defined as a combination of the seeds of two or more varieties that have closely similar characteristics. The mixed seeds are planted in any given area. Study shows that varietal mixture is an effective means of controlling the effects of biotic stresses such as tungro, bacterial blight, and blast. Perez's

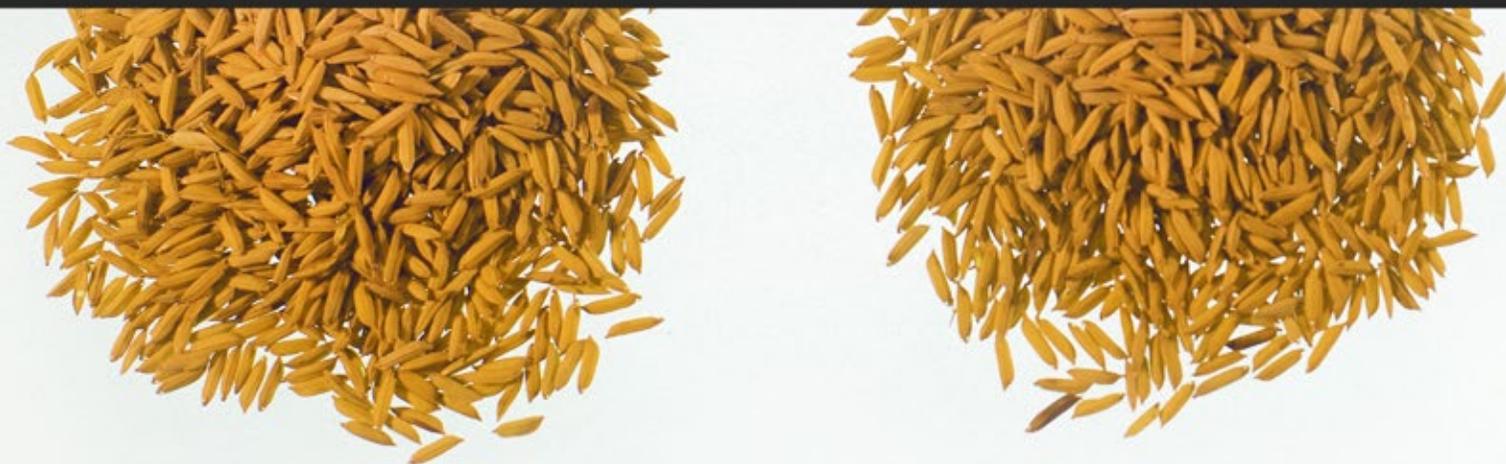
team gathered rice yield data and observed the response of rice mixture to some pests and diseases as well as drought stress that occurred during the experiment.

Most farmers hesitate to try rice mixtures for the fear of non-uniform growth, which will be a big problem during harvesting. Other farmers perceive planting different varieties will attract more pests especially in water-scarce fields.

But William Cuballes, farm cooperater of the varietal mixture demonstration area in Umiray, disproved this.

"I offered my farm for the rice mixture study in anticipation of the new information and technologies I will learn, which will be helpful to our community," Cuballes said.

Indeed, the experiment even exceeded Cuballes' expectations.



# POWER OF TWO OR MORE

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## NO EXPRESS COMBO

Varietal mixture is not as easy as mixing one variety with another. It requires close analysis on rice agronomic characteristics, eating quality, aroma, and even genetic make-up. Common rice mixture practices lack this critical process.

Perez's team first categorized the rice varieties into modern and traditional. For the modern varieties mix, the team assessed the top 20 popular and high-yielding varieties planted in Region 3 and in target experiment areas. On the other hand, farmers' preferences such as good eating quality, aroma, and pigmentation were used for traditional varieties. Among the 20 varieties, 6 were chosen based on their height, maturity, grain quality traits, and reactions to pests and diseases. The team analyzed the genetic similarity of the varieties using simple sequence repeats (SSR) markers to

help identify varietal distinctiveness and measure purity of rice seeds.

Selected rice varieties were planted and managed using the usual farm practices of farmers in Aurora. Perez said this will allow farmers to easily adopt the rice mixture technology. Performance of said varieties was also analyzed.

## COMBO RESULTS

When NSIC Rc214, Rc82, and Rc216 were mixed, the fields yielded an average of 6t/ha. But when these varieties were planted individually, they only produced 5.2, 5.3, and 5.6 t/ha, respectively. This translates to a 10-11% increase in yield!

"The increase in yield from rice mixture may be due to the genetic background stability of the varieties used against biotic (caused by living organisms) and abiotic (non-living factors) stresses,"

Perez said. The varieties complement each other in struggling against all stresses.

With the study's results, Perez is confident that rice mixture may potentially help increase yield particularly in stress-prone areas. She also added that this can be used as a stop-gap variety to help eradicate pest incidence. Such mixture, however, works only in commercial palay production, not for seed multiplication purposes.

Presently, the DA Rice Program is funding a similar investigation of rice mixtures in other rainfed or stress-prone areas in the country. The goal is to develop rice mixtures suitable to the environmental conditions in an area, improve tolerance to stresses, and enhance yield of rice.

With the ballooning population, planting rice mixtures may be a powerful tool to feeding more mouths in the future. ●



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"A chicken in every pot and a car in every garage."

Just like the famous campaign slogan of former US president Herbert Hoover, the Philippine government envisions a food-secure country where its people enjoy decent and rising standards of living.

The question is: will we ever experience this?

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- CHRISTINA A. FREDILES -

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The father works at the field; the mother takes care of the house while the children are in school — this is the typical household of a farmer — until recently.

The demand to improve crop productivity and ensure food security at the household level necessitates a paradigm shift among farming families. For instance, the father should now lead the rice-based crop production; the mother manages mushroom or livestock production, and their children are helping hands. This farm family setup is at the very core of *Palayamanan Plus* (Pal-Plus).

“The idea is to make sure that the farming knowledge is distributed to the members of the family so that they will be more productive. Farm tasks should not rest in just one member of the household,” Rizal Corales, Pal-Plus project lead, says.

## FOOD IN EVERY HOUSEHOLD

For more than a decade, PhilRice has been actively promoting the *Palayamanan* system to increase farm productivity and address food security and economic instability among farm families. The threats of climate change and fast population growth make *Palayamanan* a worthwhile venture all the more.

A 2011 PhilRice study saw that income in rainfed lowlands can be significantly increased by growing crops other than rice and integrating livestock and fish production in the farming system of farmers.

The project is related to the KABSAKA program, a pilot research and production program of DA-IRRI in rainfed lowland areas in Sta. Barbara, Iloilo, which

demonstrated that significant increase in productivity could be achieved by increasing cropping intensity, crop yields, and reducing cost of production.

Alexander Valenciano, an economic development specialist of KABSAKA reported in 1984 an increase in rice yield of about 1 t/ha with the use of higher-yielding varieties and improved cultural practices. Cropping intensity increased from 1.4 to 2.34 t/ha when two crops were grown after harvesting rice.

People within the community corroborated the increase in production citing the more numerous transactions in the sale and stocking of palay in local warehouses. The project also created more job opportunities for the community — technicians became busier helping farmers create farm plans and budgets, and more people were hired while others started their own businesses.

# Delivering support at HOME

JAYVEE P. MASILANG



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The project envisions communities being “on the same page” as far as rice-based farming system (RBFS) is concerned. Once RBFS is successfully integrated in a community, strategies on increasing income and marketing will follow suit.

#### **UPGRADING TO PALAYAMANAN PLUS**

Building on from the *Palayamanan* in 2001, Pal-Plus widens the scale, tapping more competitive, sustainable, and resilient large-scale farming solutions beyond the *bahay-kubo* concept.

The project envisions communities being “on the same page” as far as rice-based farming system (RBFS) is concerned. Once RBFS is successfully integrated in a community, strategies on increasing income and marketing will follow suit.

From here, food production will be more localized since the community acts as a unit. Pal-Plus focuses on five components — crops, livestock, mushroom, and organic fertilizer production, and mechanization and custom services provision.

One of the strategies is providing seeds to the farmer-partners.

“We have provided the farmers seeds to establish deep partnership. Through this, their rice areas serve as a demonstration farm to determine the varieties that work well in their environment,” said Corales.

Also, to intensify production, mechanization of farming activities is promoted, including custom services for primary or initial tillage, use of mechanical transplanters and combine harvesters through farmer-partners’ associations when necessary.

Women, out-of-school youth, and landless service providers can be organized and trained to venture into livestock or mushroom production and processing.

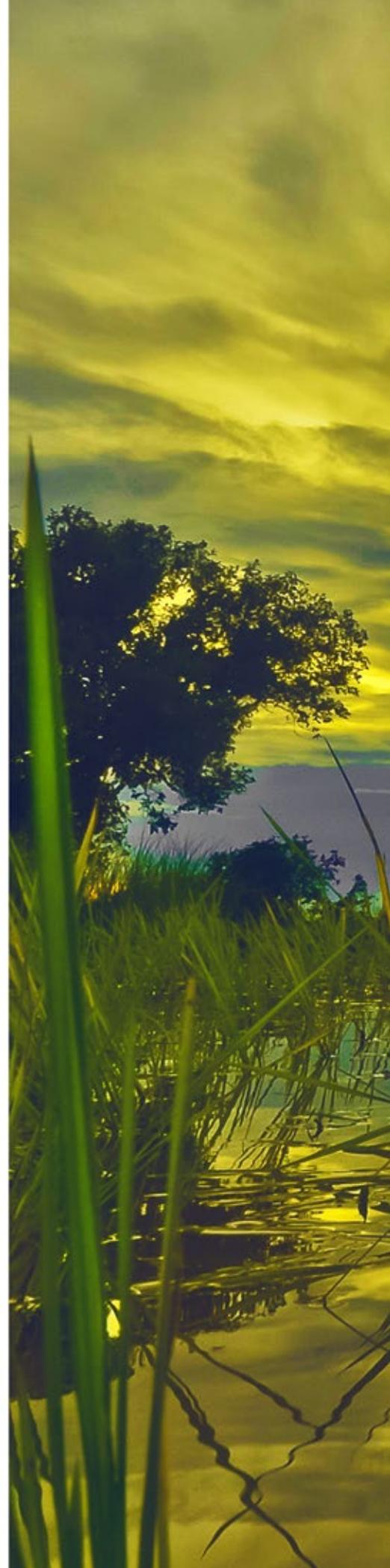
#### **NEXT STEPS**

In its initial project stage in 2014, Corales and his team have so far worked with farmers in Aurora, Bulacan, and Pampanga. New sites this year are in Nueva Ecija, Pangasinan, Isabela, and Agusan.

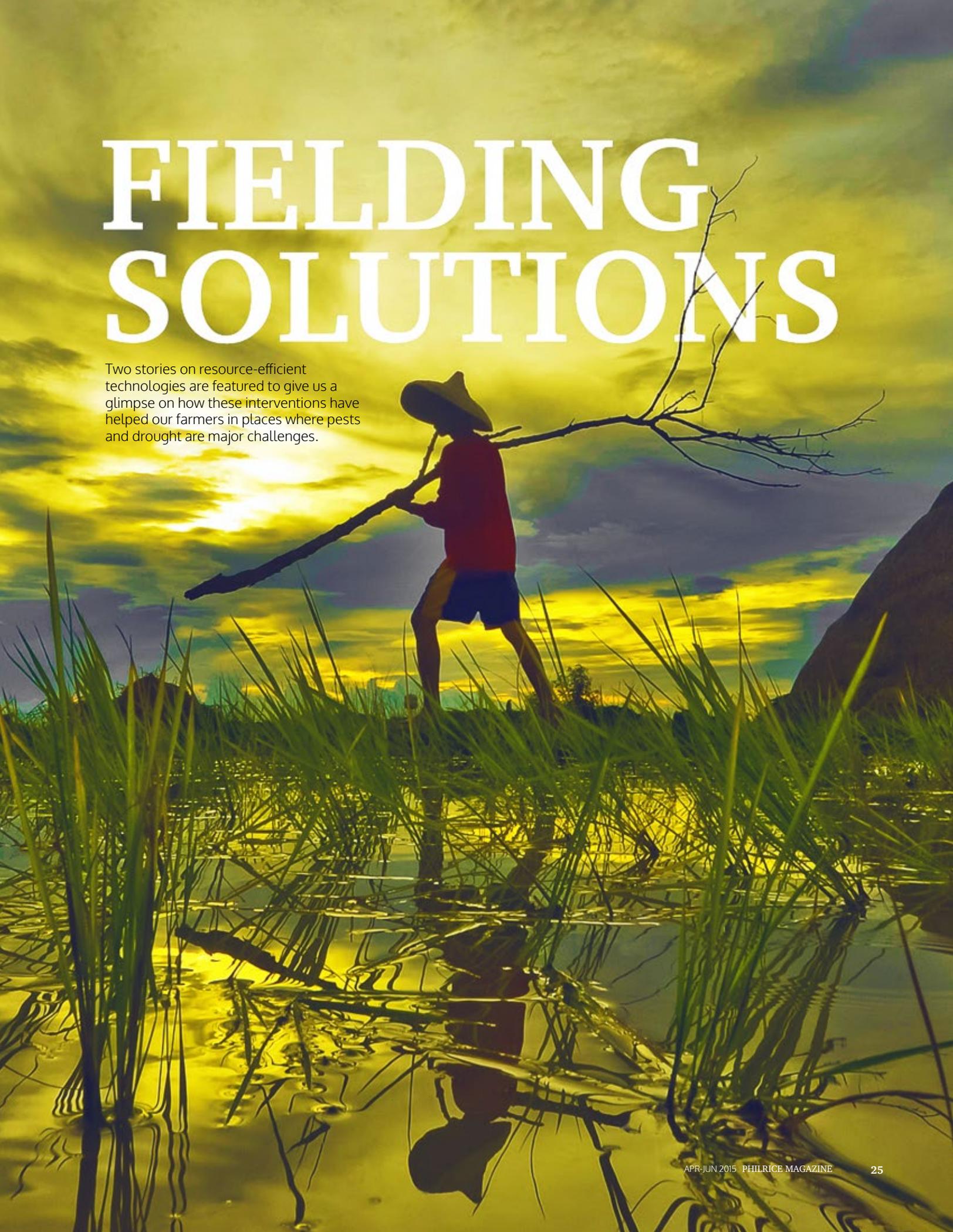
“We have been doing benchmark studies, site validation, and participatory planning in the first three study sites. Results will determine the design of the Pal-Plus model in the expansion sites. We have also identified farmer-partners to be engaged in a series of training programs and seminars,” said Corales.

To sustain Pal-Plus, the inputs are initially shouldered by the project. “Farmers will still have to pay for the input costs but the payment will go to their organization. The payment will serve as seed fund to purchase other inputs in the future,” said Dr. Aurora Corales, Pal-Plus co-project lead.

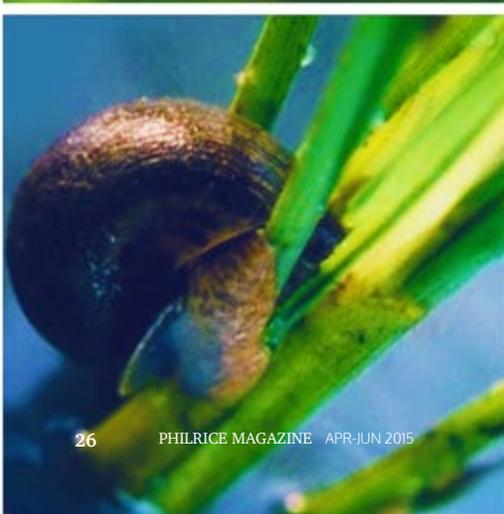
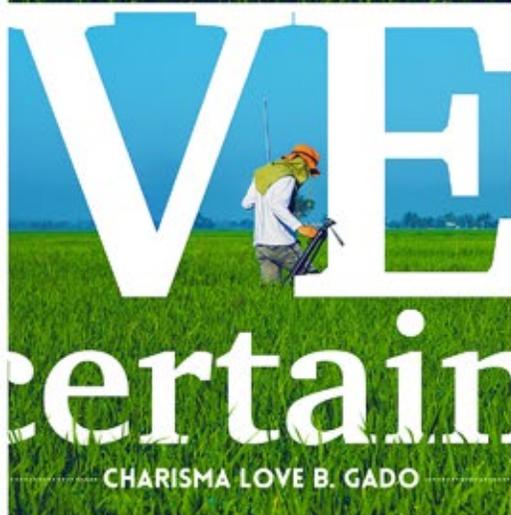
Palayamanan has been proven to help ensure food on the plate of every Filipino family, PLUS more. With problems on food security and productivity, one can now find solutions right in their very own backyard. Pal-Plus could be just the key for a more food-secure Philippines. ●



# FIELDING SOLUTIONS



Two stories on resource-efficient technologies are featured to give us a glimpse on how these interventions have helped our farmers in places where pests and drought are major challenges.



# HAND OVER

## Uncertainties

CHARISMA LOVE B. GADO

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Success may come with greater challenge. In 2013, the Philippines became Asia's fastest-growing rice producer registering the biggest improvement at 4% average increase in milled rice production. This may be appreciable, but pest occurrences and water inadequacy continue to threaten the rice industry.

As estimated by the Food and Agriculture Organization, plant pests and diseases threaten food production as global crop yields are reduced by 20 to 40% per year. With about 100 species of insect pests attacking rice, farmers lose an estimated annual average yield of 37%.

Farmers, however, can manage pests and diseases through good water management. Regrettably, water supply in some areas is dwindling while farmers have difficulty shelling out more money for irrigation.

Owing to the interrelation between pests and water, the *Food Staples Sufficiency Program* (FSSP) is "raising farm productivity and competitiveness through boosting the yield and overall productivity growth through better support mechanisms" on pest and water management.

#### **CLICKING THE PROBLEM AWAY**

Information gathered in a second can serve as farmers' aid in creating a better environment for the rice crop. Through a system being developed in an FSSP component called Philippine Rice Information System (PRiSM), information related to rice crop health will be available online through a web portal of the DA.

Probably the first in Asia, the portal is an indispensable tool for decision-makers at the regional and national levels in helping farmers reduce the occurrence and impact of pests by crafting policies, planning strategies and disaster-response activities based on the data uploaded in the website.

"In just a click, a DA regional director for example can easily monitor the pest incidence and injuries common in his/her area; thus immediately sending out recommendations to prevent an outbreak," PhilRice's Gertrudo Arida, a project component lead, said.

Targeted for a website launch within 2015, the portal will contain information on crop health recommendations, rice area estimates, and yield and production figures. Yield gaps and their causes, and crop damage from flood and drought will also be available online.

What's good in these information, Arida added, is that they will be integrated to improve pest monitoring activities in the country. A planning and monitoring tool, PRiSM contains data from surveys in different rice ecosystems conducted in 80 fields in every region.

The survey data, encoded in mobile phones, are directly transmitted to the IRRI databank, which then records plant injuries caused by pests, diseases, and weeds during the booting and ripening stages of rice.

Using the system, PRiSM had already submitted damage reports to DA after four typhoons in Nueva Ecija, Laguna, Albay, and Leyte.

To fast-track system implementation, 36 training batches on pest monitoring were conducted for partners in local government units from March 2014 to February 2015.

#### **WHEN IN DROUGHT**

Other than pests, water must be properly managed so farmers may have extra money in their pockets. However, the dwindling supply brought about by the ongoing mild spell of El Niño may leave the farmers with just a few coins.

In Sarangani, around 24,000 ha of farmlands have already been devastated by drought while North Cotabato has incurred P230 million crop damage. Farmers in Region 12 and the Autonomous Region in Muslim Mindanao had also lost P450 million worth of rice and corn crops.

The Alternate Wetting and Drying (AWD) technology being promoted under the FSSP's Associated Technologies project offers some hope. AWD, a water-saving technology that can reduce irrigation water-use without decreasing yield, is put to use through an observation well. A 30-cm-long plastic or bamboo pipe installed in a rice field, the well guides farmers on when to irrigate, usually only when the water level has dropped to about 15 cm below the surface of the soil.

Currently, project implementers nationwide had distributed 1,000 observation wells, which have helped save up to 35% on irrigation water-use. The use of AWD, now showcased in about 200 techno demo sites in 24 provinces, had decreased the frequency of water release by half without affecting yield, even increasing it in some areas. Farmers in the rainfed areas also benefited from the technology as supplemental irrigation is done five times during the vegetative stage. Unlike before, the field was continuously flooded.

Mechie Castillo, member of the Highway Katilingban Irrigators' Association in South Cotabato, increased her yield by 2 t/ha despite the reduced release of water from 12 to 6 times. She used to harvest 4.8 t/ha; 7.2 t/ha with AWD use. Field days are conducted to massively promote the technology.

The project is aiming to cover 500,000 ha and increase the irrigation-serviced areas under AWD by 5-10%, boost rice production, and reach 8 more regions by 2016 for nationwide coverage.

With the plethora of interventions for the rice sector, rice self-sufficiency is perceived as a buzz word. A perception lacking depth as rice self-sufficiency is a goal, in which mechanisms are embedded so farmers could live in certainties. The effort is not for them alone but for every Filipino. So everyone has rice to eat. ●

As the country strives for food sufficiency, the search for reliable water supply for rice production continues. It's about time though to realize that the crucial stage starts when water reaches the farmers' fields. Efficient water management greatly depends on farmers' practices and adopted techniques.

"The problem today is that farmers who have scarce water supply manage water more seriously while those who have abundant supply tend not to," Jovino L. De Dios, PhilRice soil and water management specialist, said.

It is estimated that up to 4,000 liters of water are used to produce a kilogram of palay in most Philippine rice farms.

Farmers tend to continuously flood their fields to maintain a paddy water level higher than 7 cm. This is because of their misconception that more water controls more weeds.

On the contrary, De Dios said the practice causes delayed growth, reduced tillering, and even environmental problems like global warming due to high methane gas emission. It also adversely affects fields at the tail-end of irrigation systems, as less water gets to them, if at all.

#### WHEN LESS MEANS MORE

"It is no longer a secret that we can produce more with less water," says Evangelina B. Sibayan, PhilRice Rice Engineering and Mechanization Division head and water management specialist.

"Too much water in rice production is costly," Sibayan said.

PhilRice actively develops and promotes technologies that can reduce water use in rice production without reducing yield. Proper irrigation techniques increase the efficiency of many farm inputs and help the plant grow healthier. The controlled irrigation (CI) technique has been developed for the purpose, which suggests simple but water-wise pre-planting farm practices. It uses an observation well to determine the right timing of irrigation when executing the alternate wetting and drying (AWD) method.

AWD is part of the CI technique, which helps reduce water use in rice production by 16-35%. It also conditions the soil for better root growth, balances soil nutrients, and enhances tillering capacity.

Based on actual field demonstrations and trials, yields of continuously flooded and AWD farms did not differ significantly.

"If 4 farmers practice AWD, they can save enough water for one more farmer. This is of great help for farmers who are at the tail-end of an irrigation system," Sibayan explains.



The problem today is that farmers who have scarce water supply manage water more seriously while those who have abundant supply tend not to.

- Jovino L. De Dios

Jesus Panes Jr. from North Cotabato proves this:

"I have been practicing AWD for 2 years now, and ever since, I never had problems managing our water supply. Best of all, my yield increased from 113 to 144 cav/ha," Panes said.

Apart from being a climate change adaptation strategy, the AWD method is also a mitigating technology. In fact, the United Nations Framework Convention on Climate Change has included AWD as one of the practices that reduce methane emissions by 45% annually.

#### CHANGE NEEDED

While yield-enhancing and cost-reducing technologies are available, the challenge is how to make more farmers adopt them.

"The question has always been on how our farmers will react to these changes because they haven't done these techniques before. People are afraid of what they don't know," Sibayan said.

Since 33% of the total water requirement goes to land preparation alone, Sibayan recommends the dry tillage and dry seeding technologies to save on water.

Dry-seeded crops require less labor and tend to mature faster than transplanted crops.

In this method, plants are not subjected to stresses such as being pulled from the soil and re-establishing fine rootlets. This way, weeds will be an issue.

Results of studies on water-saving irrigation techniques for transplanted and direct-seeded lowland rice also show that rice does not require continuous flooding to produce good yield.

Sibayan also recommends the use of early-maturing and drought-tolerant varieties.

Farmers like Teddy Cagurin of Iloilo had been using PSB Rc10, an early-maturing and drought-tolerant variety. "This method has been very helpful since I don't have to worry about my farm during the dry season. But I still want to learn more techniques to manage water," Cagurin said in Filipino.

"Collectively, all of these practices would result in better rice production in our country, thus help us in our rice self-sufficiency goal. However, this takes a very decisive and much disciplined management of our irrigation system and the cooperation of our farmers," Sibayan added. ●

# THE WATER MARK

JOHN GLEN S. SAROL



Machines, since the early times, were invented to make work less taxing to anyone. This could not be more true in rice farming, particularly during harvesting, where a hectare of land requires 15 people to finish it in 2 days. With machines today, not only can farmers save time, money, and labor but also improve their competitiveness in general.

### ENSURING QUANTITY AND QUALITY

Postproduction is one of the most important processes in rice production. After waiting for 4 long months, contending with pests, diseases, and weather, farmers can't afford to lower yield at the very last stage.

Post-production is a give-and-take process. The quality and volume of yield greatly depend on how much and what kind of investment one is willing to provide.

Annually, the Philippines suffers from about P50 B worth of postharvest losses in agriculture, 14.84% (P7.4 B) of which is solely on rice. In 2010, the Philippine Center for Postharvest Development and Mechanization (PHilMech) and PhilRice reported 16.47% loss in postharvest operations alone. The loss could have increased the total palay produced that year by 2.5 M mt, or more than 18 M mt instead of only 15.77 M mt. These losses are due to early or delayed time of harvesting, shattering, processing factors, machine inefficiency, operator's inability, and deterioration during storage, thereby reducing the quantity and quality of the harvest.

With the country's bid to rice self-sufficiency, any loss could mean a step away from attaining the goal. PhilRice's Engr. Eden Gagelonia reiterated that proper and timely harvest, place, and machines must be well considered.

### EASIER, BETTER

A PHilMech survey in Nueva Ecija revealed a 50% increase in the level of mechanization from 2007 to 2012.

The rice combine harvester was introduced in the early 80s but it got popular just recently with problems on manpower, time, input cost, and climate change surfacing. This one-of-a-kind machine can harvest, thresh, clean, and bag grains in a

single-pass operation. What used to be a task for 15 people in 2 days is now done by 2 operators in 2 hours.

For farmer Benjamin Cuaresma from Pangasinan, shifting from manual harvesting to mechanical was a good decision. "I've been using the rice combine since 2014. It's my third cropping now and I realize that I really saved on labor and time. Using the combine, I can now harvest 120 cav/ha in just a little more than 2 hours!" he said.

Magnon Pascua, also a farmer from Pangasinan, agrees with Cuaresma. He fondly calls the combine harvester "buwaya" as it is a strong and fast worker. He used the combine last year in harvesting rice from his 10-ha farm.

I used my income from rice and corn to buy my combine harvester. Also, I'm making some money from it as I allow other farmers to rent the machine. This way, they, too, can benefit from it," Magnon said.

### THRESHING ADVICE

Threshing contributes 2.18% to total postproduction losses, PHilMech warns. PhilRice recommends types of threshers based on the method of feeding: Hold-on type — which strips the grain from the panicle without damaging the straw; and

Throw-in type — which has separating and cleaning mechanisms.

The pedal thresher, a hold-on type machine, is quite popular to farmers especially in the uplands. It works



when the farmer holds the harvested baylita against the wire loop of the revolving cylinder while one or two individuals feed the bales from behind the thresher. This is deemed

more effective and fast, and can be utilized moving from plot to plot to lessen labor in transporting the harvest.

Likewise, IRRI recommends the axial-flow thresher, a throw-in type, as it can handle wet panicles and can thresh 700-800kg per hour. It saves more than 2% loss when used. This

harvest in a dry and shady place to facilitate air circulation and prevent excessive heating.

"About 80% of farmers prefer to sell their freshly threshed grains than drying them. This implies that most farmers don't have an area for drying, or need immediate money to sustain their current needs," Gagelonia added.

Cuaresma, however, prefers to sun-dry his harvest during dry season as it sells higher than sold fresh.

could dry 1 to 6 t or up to 120 cav per batch and decrease moisture at 1% rate per hour. The drying temperature level of the reversible dryer is easy to control and is constantly drying the grains without manually mixing them.

Researchers advise farmers to maintain 43°C drying temperature for grains if they plan to replant them for the next cropping season. The temperature could go up to 50-54°C if grains are for immediate milling.



# Raising Farmers' Standards through MACHINES

JAYSON C. BERTO

## DRY WHAT FITS

According to the 2010 study of PhilMech and PhilRice, drying and milling respectively contribute 5.86% and 5.52% to losses.

Sun-drying is a common practice among farmers and traders because it is cheap and requires less energy. Grains, however, are prone to cracks, inert materials, and over exposure to heat.

PhilRice promotes mechanical dryers such as the flatbed or the reversible type, which

To increase rice productivity at the lowest production cost possible is one of the ultimate goals of DA under the FSSP. DA believes that making appropriate mechanization and postharvest facilities accessible to farmers will give them the extra push to be competitive and produce more rice.

With the ASEAN integration now happening, DA is focusing its efforts on preparing farmers to be competitive and boost farm mechanization in the country. ●

machine, however, needs proper adjustment and replacement once its peg tooth has blunted.

Gagelonia noted that if threshing is delayed, a farmer must keep the bundled

Mula sa kabundukan ng Iba, Zambales, sinisilip ko ang kaulapan sa karagatan ng West Philippine Sea pagsapit ng Marso. Dito sa amin sa Sitio Lupang Pangako, Brgy San Agustin, ang mga makakapal na ulap sa kanluran ang hudyat ng aming pagsasaka. Kapag namumuo na ang mga kaulapan, senyales iyon na malapit nang pumatak ang ulan. Mag-uumpisa na ang paghahanda ng lupa na aming pagtatamnan ng palay.

Lubhang napakahirap ang pagtatanim ng palay sa mga kabundukan, lalo na kung wala kang binhi. Karaniwang problema ito naming mga kulot. Kadalasan kasi nakakain na namin ang aming palay bago pa man dumating ang tag-ulan.

Kakaunti lang ang ani lalo pa't pinagbabawal ng Department of Environment and Natural Resources

(DENR) ang pagkakaingin. Ang iba sa aking mga kasamahan, napipilitang bumaba sa bayan at manghingi ng pagkain, di bale nang nagiging biktima kami ng panlalait. Bunsod marahil ng aming kahirapan, at ng pagiging kaiba ng aming pisikal na kaanyuhan.

Isa ako sa mga pinalad na mabigyan ng 2.5 kilong binhing palay noong 2012. Kakarampot, pero masaya ako sa aking natanggap. Masarap daw kasi ang binhing iyon at mas malakas umani kumpara sa aming nakasanayang itinatanim. Gaya ng karaniwang ginagawa, pinagbuti naming magpamilya ang pag-aalaga ng mga pananim.

Malaking tulong na may mga tao sa gobyerno na umaalalay

sa aming pagsasaka, kahit napakalayo ng aming komunidad sa kabayanan. Sinunod namin ang mga itinuturo sa amin, at naging maganda ang resulta. Kung dati ay dalawang beses lang kami magpunta sa aming taniman, ngayon ay tatlong araw na sa isang linggo. Nasubaybayan naming mabuti ang paglaki ng aming palay.

May tanim din kaming sitaw, kamote, munggo, kalabasa, patola, at mais.

Dumating ang Oktubre na sana ay panahon ng anihan. Sumabay naman ang mga bagyo at malalakas na hanging habagat. Nasira ang aming mga pananim. Apat na kilo lang ang aming naani. Aabot sana ng dalawang lata o mga 16 kilo ang aking aanihin kung hindi nasalanta.

Naghanap kami ng ibang pagkakakitaan. Mas sinipagan pa namin ang pagkuha



ng buho sa mga kabundukan na aming inilalako sa bayan. Pinayagan na rin kami ng DENR na mag-uling, basta't mga nabuwal na puno lamang ang aming uulingin.

Itinabi ko ang apat na kilong binhi at muling nagtanim noong 2013. Patuloy pa rin ang aming pag-aaral sa pagtanim ng palay, at halos lahat na yatang pamamaraan ay amin nang natutuhan. Aming isinagawa ang mga bagong kaalaman.

Salamat at walang malakas na bagyong dumating. Maganda ang tayo ng palay at hitik na hitik ang mga uhay. Subali't hindi lubos ang lahat. Mas naunang nahinog ang butil ng tanim kong palay kaysa sa mga katabi kong sakahan. Halos kalahati ang kinain ng ibon. Pero salamat pa rin dahil 15 kilo ang aking naani.

May ani man ako, hindi ko ito binabawasan. Tiniis naming kumain ng bigas NFA na binili sa bayan, na minsan ay may amoy at halong dilaw na butil. Nakakatawang isipin na kaming nagtatanim ng palay ay hindi makakain ng masarap na kanin.

Mayo 2014 ay muli kong itinanim ang aking binhi. Nagpahuli ako nang dalawang linggo sa pagtanim para makasabay sa pag-aani ng aking mga kasama. Naglagay ako ng mas maraming organikong pataba na galing sa binulok na mga dayami, dumi ng kalabaw, dahon ng madre de cacao, at parte ng mga gulay na hindi kinakain ng kambing at kalabaw.

Natutuhan na rin namin ang mga pamamaraan sa pagsugpo ng mga peste. Naglagay na rin kami ng organikong foliar para sa magandang bulas ng aming mga palay at gulay. Dumating ang anihan at

nakaani ako ng 2.5 kaban. Itinabi ko ang 1.5 kaban na aking gagamitin ngayong 2015 tag-ulan. Ang natira ay ipanghahalo sa NFA na bigas at nang sumarap-sarap namin.

Sabi nila, bukod sa pagiging tamad, mahirap daw turuan ang mga katulad kong kulot. Pero di nila alam, dito sa Lupang Pangako, isinasagawa namin ang aming mga natutuhan.

Kung magiging maganda ang panahon panigurado marami akong aanihin. Sobra-sobra pa siguro sa pangangailangan ng aking pamilya. Sa wakas ay makakakain na kami ng masarap na kanin. Marahil ay makakapagbaba pa ako ng palay sa bayan.

Siguro, kung makapagbaba kami ng masarap na palay, gulay, at halamang ugat ay mababago na ang pagtingin sa amin ng mga taga patag. Siguro... ●

# ISATAKA

**BUMABANGON  
SA LUPANG  
PANGAKO**

JULIAN C. MACADAMIA

**Kwento ni Roger Bagat, 48,  
farmer-cooperator ng Upland  
Rice Development Program**



While we report success stories, we know better than to rest on our laurels. Like the clock, we keep going. We know that our numbers of success will pale as long as there are millions to feed, and that the threats to food production are not decreasing through time...

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