

Quality Rice. Quality Life.



2017
National Rice R&D
Highlights

RICE BUSINESS
INNOVATIONS
SYSTEMS



Philippine Rice Research Institute
Central Experiment Station
Maligaya, Science City of Muñoz, 3119 Nueva Ecija

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PhilRice Los Baños

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Executive Summary

PhilRice Los Baños Station serves two of the largest and most geographically diverse regions in the country - CALABARZON and MIMAROPA by developing and innovating location-specific rice and rice-based technologies. It is home to a dynamic and technically equipped research and development staff ___ that conducts 15 division- and station-based research studies; 11 development studies and activities; and 10 externally-funded R&D projects.

The Station's Breeding group stakes the claim for producing the first three commercialized TGMS hybrids in the country--Mestiso 19, 20, and 73. They are also tasked to purify, maintain, produce, and distribute nucleus and breeder seeds of public released hybrids (Mestizo 1, Mestiso 19, and Mestiso 20) in support to the government's hybrid rice commercialization program. This year, they developed the hybrid seed production protocol for newly released hybrids that serves as guide for F1 seed growers in planting newly released hybrids. The protocol also serves as the Breeding Group's internal quality control when conducting grow-out test, viability testing, and other methods of purity assessment which are vital in ensuring that seeds produced in PhilRice are of high quality.

Another major accomplishment of the Station's Breeding Group is their developed innovation of incorporating purple-based trait to popular hybrids Mestiso 19 (NSIC Rc 202H) and Mestiso 20 (NSIC Rc 204H), as this could lead to better quality F1 hybrid seeds in the future. This also has the potential of speeding-up results of grow-out testing from season long (i.e. 3-4 months) to 15-21 days. Future testing of genetic purity using this technology is also found to be cheaper and simpler as no sophisticated laboratory equipment is needed.

Congruent to the Breeding activities of the Station, our Rice Chemistry and Quality Laboratory and Tissue Culture Laboratory continuously develop methods and techniques on grain quality characterization and mass propagation techniques through Anther and Tissue Culture in support to the breeding program.

As the Station that developed the Minus-One Element Technique (MOET), we continue to actively promote the use of MOET in analyzing farmer's soils in our area of responsibility. And to extend our reach and further our relevance, we continuously conduct dynamic development projects and initiatives that address the particular needs of our partners and

stakeholders in the Region through the conduct of on-station and off-station development researches and activities.

Our on-station development activities include multi-faceted field demonstration and activities that cater to a wide-range of stakeholders (i.e. farmers, students, researchers, and others). These include the Learning Farm, Lakbay Palay, 10-5 Challenge, Palayamanan Plus, One Stop Information Shop (OSIS), and targeted knowledge-sharing and learning strategies .

As part of its knowledge and sharing and learning strategy, PhilRice Los Baños conducts 4 quarterly thematic seminar series annually that aims to share the latest research information, technologies, programs and issues on rice from PhilRice and other R&D and academic institutions to staff, students, farmers, agricultural leaders, and professionals. This resulted in strengthened collaborations with different academe, government and R and D institutions such as the International Rice Research Institute (IRRI), University of the Philippines Los Baños (UPLB), Department of Energy (DOE), Laguna State Polytechnic University (LSPU), Central Luzon State University (CLSU), and PhilRice Central Experiment Station. Audience for this was not limited to station staff; other individuals and groups from Region IV and the National Capital Region were also invited over formal invitations and through social media.

Another accomplishment is the number of invitations (minimum of 50 per year) the Station receives for R and D staff to serve as Resource Speakers in several trainings and seminars from the Agricultural Training Institute IVA, BPI NSCQS IVA, Provincial and Municipal Governments of Oriental Mindoro, Palawan, Cavite, Laguna, Batangas, Rizal, and Quezon, Philippine Fiber Industry Region IVB, DA RFO IVA and IVB. Corollary to this is the conduct of seven in-house trainings for Station Staff aimed at enhancing their skills on creativity, processing, information technology, and rice S and T. The PhilRice LB OSIS acts as the node that connects most station activities as it involves 4 components: 1) Palay-aklatan, 2) exhibits, 3) database, and 4) visitors services.

The off-station initiatives address the needs of particular sector in the rice industry - establishment and showcasing the Rice Garden at the Luneta to promote and enhance rice awareness and appreciation of urban dwellers; transforming rice farming communities into rice-based enterprise hubs through clustering approach; and strengthening resiliency of rainfed and upland rice farming communities to climate change. All these initiatives have the ultimate aim of improving farm productivity and profitability of rice farmers in Region IV.

For 2017, two rainfed rice farming communities were established through community organizing approach aimed at strengthening their

resiliency to climate change in Mulanay, Quezon. This is being conducted in close partnership with DA-RFO IVA, Provincial Agriculture Office of Quezon, Local Government Unit of Mulanay, and Polytechnic University of the Philippines-Mulanay. Seventy-eight rainfed farmers from two barangays are participating in the project. Similarly, through the Rice Business Innovations System (RiceBIS) Program, a rice farming community in Barangays Morong and Antipolo, Sariaya, Quezon will be transformed into rice-based enterprise hubs through clustering approach.

Lastly, as the Station's contribution to the annual rice awareness month celebration, the Ceremonial Rice Harvesting at the Luneta was conducted where around 350 elementary and high school students and teachers from 10 schools (7 elementary, 3 high schools) participated.

In sum, it is the ultimate aim of the Los Baños Station to continue to be relevant and responsive to the rice science and technology needs of our partners and stakeholders, and lead in crafting and directing the rice science and technology program in Region IV.

I. Learning Farm, Palayabangan, and Trainings

CJM Tado, JLO Canilao, FS Aguilar, VD Ompad, and MM Movillon

For the regional implementation of the Clean, Green, Practical, and Smart On-farm Learning Center (Clean GPS On-farm Learning Center) for farmers, student-trainees, AEWs, visitors, partners/stakeholders, local, national, and international farming communities, to more intensive learning experiences in the field of sustainable and resilient agriculture, three (3) studies were locally implemented, as follows: 1) PALAY-Aralan: PhilRice Los Banos Learning Farm; 2) Palayabangan: The 10-5 Challenge-Los Baños; and 3) Training of PhilRice Los Baños Staff, that aims to develop a holistic and comprehensive technology package through the integrated and diversified rice-based production systems approach, capacity enhancement, and inclusion of other available technology components that maximizes the potentials of agriculture that are sustainable and cost-effective.

Study 1: The Learning Farm

The Learning Farm is a simulated field showing actual rice plants of modern varieties at different growth stages for the different rice-growing environments and for various consumers' needs and preferences. The project is envisioned to educate the general public about rice and its importance to Filipinos; showcase the spectrum from seeding to harvesting, and recent technological advancement that can improve rice farming and enhance the quality of life of the Filipino farmer. Furthermore, it served as venue for training with various government agencies, SUCs, farmer groups and

students.

In 2017, different growth stages of rice were showcased with the use of Mestiso 20 during the Dry Season and NSIC Rc 160. While the varietal demo component was planted with NSIC Rc 420, NSIC Rc 400; NSIC Rc 390 and NSIC Rc 300. Along with the establishment of the showcase of the growth stages and varietal demo the adopted technologies of PhilRice were also promoted, namely: Alternate Wetting and Drying, Minus-One Element Technique, and Leaf Color Chart.

It also highlighted the Palayamanan system and ecological engineering. A total of 16 groups were toured in the site in 2017. The visitors were categorized into: Farmers' Associations, staff of DA attached agencies (DA Region, DA Province and DA LGU), and students (college, high school, elementary and pre-school). It has also served as site and venue for Station's hands-on activities during trainings and workshops, specifically during the Rice Appreciation Training Course for new R&D Staff and Administrative staff last November 6-8, 2017, where the sixteen (16) participants of the training had hands-on training on Agro-ecosystem Analysis (AESA), land preparation, dike construction, transplanting, and harvesting.

Study 2: The 10-5 Challenge-Los Baños

The 10-5 challenge aims to raise the rice production standard to 10t/ha yield at P5.00 input cost for every kilogram of palay produced. Current average yield is about 4t/ha while input cost is about P11/kg of palay. This initiative likewise aims to provide opportunities for all players in the rice sector to show what they can do to improve yield and reduce production cost. It supports the country's goal of food security and help increase farmers' productivity for global competitiveness.

For the past years of the Palayabangan: the 10-5 challenge, it was observed that during the dry season of each contest was the favorable condition for the participants. It was during the 2016 and 2017 dry season where an average yield of 6.1 was attained with an average cost per kilogram of P10.58 and P13.42, respectively. This was attributed to the favorable environment and longer duration of sunlight and the absence of weather disturbance in attaining this average yield across the contest period. Data on the wet season average result on cost and returns are not yet available.

Based on the results of the contest for the past 4.5 years, the highest yield was attainable if a farmer would adopt most of the Palayabangan protocol's best practices documented all throughout the contest period. Bayer Cropscience and Dupont Pioneer attained significant yield of 7.1 tons and 8.2 tons, with production cost of Php 6.68 and Php 7.97, respectively.

Study 3: Training of PhilRice Los Baños Staff

An organization can be more productive if staff members are exposed to trainings, workshops and seminars. Latest technologies and issues on rice and rice-based farming should be consistently updated to PhilRice staff, involving researchers, development leaders, labor groups and the administrative staff. This study specifically aims to: 1) formulate specific objectives for various training/seminar/workshop for different station units; 2) evaluate the effectiveness of the trainings; and 3) formulate recommendations for the improvement of the trainings.

A total of seven trainings were conducted by the station in 2017 which were the following: 1) Basic Adobe CS5 Photoshop Tutorial Workshop for Staff; 2) Re-echo Training Workshop for the Rice-Based Farm Household Survey (RBHFS); 3) PalayStat Hands-On Demonstration; 4) IT Productivity Seminar Roadshow; 5) Seminar/Training on Land Preparation for Rice Production and Farm Credit Assistance for RiceBIS Farmers in Sariaya, Quezon; 6) Briefing and Hands-on Activity for Work Immersion for Rice Mechanization Operations for K-12 students of the Nicolas Galvez Memorial Integrated National High School (NGMINHS); and 7) Appreciation Course on Rice Science and Technology for Non-Technical Staff Members of PhilRice Los Baños. The trainees' skills on creativity, processing, information technology, and rice S and T were enhanced through different trainings set. Training collaborations with PhilRice-CES' different development divisions were effective in managing and producing the training activities. Overall, the evaluation of the trainings ranged from good to excellent. Positive feedback on these trainings were also given by the participants.

II. Harnessing the Promotion and Enhancing Rice Awareness and Appreciation in Urban Setting

CJM Tado, VD Ompad, and JN Puerto

In urban areas, the public are not familiar with the rice plants and different rice production activities. Hence, the Philippine Rice Research Institute (PhilRice), Asia Rice Foundation, National Committee for Parks and Development, Bureau of Plant Industry, and Local Government of Manila City collaborated and established the Rice Garden with the following objectives: 1) Increase and sustain the awareness and knowledge of the participants and general public on the importance of rice and rice technologies as well as banner programs and campaigns; 2) Proactively reach more target clients, stakeholders and key players in the rice industry continuum and bring relevant rice information closer to a wider and varied audiences (especially students in the NCR and general public) visiting the Rice Garden at the Rizal Park in Luneta; and 3) Successfully conduct relevant

activities promoting rice awareness such as Rice Quiz Bee, Palay Indakan, Palay Bigkasan and Riceponsible Nation Comic and Cartoon Competition. These would be participated in by high school and elementary students from NCR and target areas. The objectives were achieved through the establishment of demo set up of traditional, modern high-yielding, and hybrid varieties, and Palayamanan.

The Rice Garden facility is open to the public for two cropping (2) seasons per year. For the 2017 dry season it was planted with Pinalawan (Traditional Variety), NSIC Rc 300 (Modern High-Yielding Variety), and Mestiso 20 (Hybrid variety). In addition, the Palayamanan was maintained by showcasing different vegetables, herbs, and spices. For the wet season, it was planted with Pinilit (Traditional Variety), NSIC Rc 222 (Modern High-Yielding Variety), and Mestiso 20 (Hybrid variety). And to highlight the National Rice Awareness Month celebration, the 2017 Ceremonial Rice Harvesting at the Rice Garden was conducted last November 24, 2017. It was attended by three hundred fifty (350) students and participants, most of whom participated in the ceremonial harvesting—where they get to have first-hand experience of harvesting rice. Also highlighted during the event were the allied contests--Palay Indakan and Palay Bigkasan, where Padre Gomez Elementary School and Tondo High School emerged as champions, respectively. While the Station's One Stop Information Shop (OSIS) and Business Development Division (BDD) exhibited and displayed appropriate IECs' materials and PhilRice products.

III. PhilRice Los Baños One-Stop Information Shop

JLO Canilao, JN Puerto, MSM Canilao, and MM Movillon

The One-Stop Information Shop or OSIS of PhilRice Los Baños is an information hub that caters to the station's stakeholders, primarily the farmers, extension workers, students, and researchers, by providing accessible, comprehensive, and updated information about Philippine rice. It sought to increase awareness and knowledge of stakeholders on rice, agriculture, and the Institute's banner programs and campaigns; and encourage the youth to take rice S&T related courses, and enable them to appreciate their roles in the future rice industry and in helping feed a growing nation. In doing so, the OSIS adopted a multi-strategy approach through its 3 major components: 1) Palay-Aklatan (mini-library) with 40% increase in collection in 2017; 2) PhilRice database; and 3) exhibits (catered 4 major and 2 minor exhibits), and mini-museum. All these components utilized multimedia materials, exhibit collaterals and murals in delivering rice information. With the project's development, the extension of knowledge through OSIS was not limited to visitors alone, but had branched out to different functions such as: 1) venue for staff and visitors' meetings and media interviews; 2) venue for station events (LOA signing and other informal

programs of the station); 3) served as final stop for the 16 station tours from February to November 2017; 4) as lounge area for Business Development Division (BDD) clients; 5) gateway in accessing the different online accessions and PhilRice information web portals and agency libraries through a computer kiosk; and 6) lead in the establishment of satellite OSIS at schools. The OSIS evolved into a complex system that had favorable results to its staff, visitors, and OSIS partner agencies in the overall appreciation and learning about rice and agriculture.

IV. Strengthening Resiliency of Rainfed and Upland Rice Farming Communities to Climate Change

IDG Olvida, AJM Roa, JS Baldoz, GO San Valentin, MO Manalo, and NA Labor

Most rainfed and upland farmers live below the poverty threshold, located in marginal areas, and lack access to most services, and thus are considered highly vulnerable (Eriksen and O'Brien, 2007). Unfortunately, their situation is further exacerbated by changing climate that results in their further entrenchment in the economic margins. Through this project, PhilRice Los Baños, Romblon State University, and Romblon LGUs, identified four rice ecosystems that are considered vulnerable to climate change--upland, favorable and unfavorable rainfed, and salt water intruded rice areas. It aimed to develop the capacities of these farming communities through development of location-specific technology recommendations per ecosystem.

After three years of project implementation, specific climate adaptation capacities among the communities have been enhanced--adjustment of planting calendars based on weather condition; adoption of diversified and integrated rice-based farming system; judicious use of appropriate rice varieties based on ecosystem; planting of suitable high-value crops based on local condition; and keen climate awareness. Results also showed that developing the FFS curriculum with the community; and developing its content based on their identified needs through community meetings, key informant interviews (KIIs) and focus group discussions (FGDs) are effective ways of ensuring their committed participation. However, engagement of local partners from project planning to implementation, and monitoring and evaluation should also be given equal emphasis. It can also be established that a tripartite partnership among national agency, a state university, and LGUs is important when implementing similar development project.

V. Lakbay-Palay - LB

CJM Tado and KC. Saraos

Philippine Rice Research Los Baños (PhilRice LB) conducts field days and technology forums to update the rice farmers to the new technologies, campaigns and other R&D activities of the station. It serves as venues for the rice farmers and other stakeholders to meet with the experts and key persons under the rice industry. PhilRice LB serves the rice farmers from CALABARZON and MIMAROPA Regions. Around 400 participants for the 2017 wet season Lakbay-Palay are from CALABARZON and other representatives from MIMAROPA composed of rice farmers and other stakeholders. The theme of the activity was “Binhing Angkop at Sapat, Itaguyod Natin!” which focused on public hybrid and inbred seeds toward increased productivity. The field tour showcased the different matured technologies of PhilRice (Hybrid Yield Trial, SXP and AXR Hybrid Seed Production, Inbred Seed Production).

VI. Palayamanan Plus: Intensified Rice Based Agri Bio System – LB

FS Aguilar

As one of the program thrusts of PhilRice, the Intensified Rice Based Agri Bio System (IRBAS) or Palayamanan Plus, every station is mandated to be transformed into one nuclei to serve as the model in different crop management practices in diversification and intensification of rice based products. It is also aimed to showcase maximum utilization of biomass such as rice straw for use as substrates in mushroom and vermicomposting to help farmers improve their productivity and income.

Engaging into special quality traditional rice production for brown rice is an advantage at PhilRice Los Baños because the station is housed at the prime scientific community wherein many people and stakeholders are health conscious. PhilRice business development division as the marketing arm of the station is the one in-charge of marketing and selling the Palayamanan Plus products of specialty quality traditional rice such as brown rice, red rice and black rice priced at 45 and 65 pesos.

To fully utilize the rice biomass as the by-product of harvesting and threshing, PhilRice Los Baños engaged in mushroom production as one of the model components of Palayamanan Plus in the station. Rice straw is being collected and used as substrates in producing mushroom. Rice straw is mixed with saw dust at 70-30 ratio. *Pleurotus florida* or commonly known as oyster mushroom is used since it is favorable and adapted to the temperate environment of the country. Also mushroom is rich in vitamins and minerals

that is good for the body and health. Usually, a single fruiting bag has an average yield of 150-175 grams per bag, in a duration of one month in a single cycle. Harvested mushroom was delivered to the BDD office for marketing with a price of 250 pesos per kilo. Initially, employees and visiting stakeholders were the customers who buy the mushroom produce.

Another component that is being implemented by the station is the vermicompost production. Production of vermicompost uses rice straw waste biomass as substrates. Wastes from mushroom spent is also being used as a substrate material, incorporated with carabao manure. Vermicompost costs P7 per kilo while African Night Crawler worm costs P150-250 per kilo. Most of the clients who buy these by-products were visiting rice farmers and other stakeholders. The vermicompost is also being used in the Station’s different experimental and production area. Another by-product of vermicomposting through the brewing process is the vermi tea which is used as bio control agent and organic foliar fertilizer when sprayed to the rice plants during seedling until maturity stage. Vermi tea is also used and sprayed at the vermicomposting bins to hasten the decomposition of the substrates.

VII. Rice Business Innovations System (RiceBIS) Community

CJM Tado, IDG Olvida, KCQ Saraos, RMO Tumanguil, MAC Torres, and CGP Fernandez

1. Strategic Communication

This study was conducted to promote better mindset, attitude and behavior that would lead to improved farmers’ well-being, and to mobilize public action or stakeholders’ engagement for policy change in Sariaya, Quezon. Communication activities under the three established phases were employed to achieve such objectives. These are as follows: (1) Pre-Implementation that includes Social Preparation and Social Reinforcement and Mobilization; (2) During Implementation that includes Action, Maintenance, and Documentation; and (3) After Implementation that includes Documentation of Early Adopters.

Stakeholders’ meeting and activities were conducted to brief the stakeholders including the farmers about the RiceBIS program during the Pre-Implementation phase. Reading materials for this included brochures, leaflets, and banners. During the implementation proper, several communication activities were initiated including the launching of PalayTambayan, conduct of mindsetting activities and values formation, and providing communication support for all activities conducted during the span of trainings and seminars. Event tarpaulins and field banners were also set up as references of the activities conducted and tools of information to supplement the trainings and seminars. In order to elicit feedback about

the effectiveness of the activities conducted, brief interviews and group discussions were employed to determine the topics or concepts learned, highlights, and suggestions for improvement.

It was observed that the farmers of MORAN Irrigators' Association were receptive in the launching of the PalayTambayan. Its establishment, however, was not fully utilized due to its location restrictions. It has then been decided to construct and set up a PalayTambayan at another location where it is freely accessible by everyone. Currently, initial plans have been made and coordinated with the stakeholders in pursuit of having an area for PalayTambayan and the rest of the activities that will be conducted such as trainings, seminars, and meetings. Mindsetting activities, on the other hand, were seen as an effective means of prompting meaningful discussions about the program and how it can positively affect their behaviors and attitudes. Meanwhile, methods of communication used for effective information dissemination included the use of SMS and PTC, as well as announcements after every activity. Due to the limitations in using PTC, SMS was used more often for its easy access and mobility.

2. Engaging Farmers Organizations for Sustainable and Progressive Rice-based Community

Organizational building was conducted to support the RiceBIS project. Building strong partnership between individual farmers through cooperatives or associations can help maximize our rice farmers' available resources. It aims to enhance the farmers' social capital through community engagement and strengthening of rice-based farmers' organizations to increase the income of farming households towards a sustainable and progressive farming community.

Site working group (SWG) were formed during the stakeholders' meeting. RiceBIS team conducted three stakeholders' meeting and two farmers meeting for site selection, planning of activities and clustering of farmers in the community. SWG is composed of representatives from the DA RFO-IVA, DA-ATI, OPA-Quezon, OPA-Quezon, LGU Sariaya, and RiceBIS Los Baños team. The involvement of each member were formalized through memorandum of agreement and memorandum of understanding. Fertilizers and machinery were and will be provided by DA RFO-IVA until 2020; seeds for roll-over were provided by PhilRice; trainings and other assistance needed during field days were and will be provided by OPA Quezon and LGU Sariaya; while a season-long Farm Business School will be provided by DA-ATI IVA in 2018.

MORAN Irrigators' Association is composed of more than 100 rice farmers from Brgy. Morong and Antipolo. They were formed with the help of

NIA-Quezon for their communal irrigation system. There are four potential clusters from the organization with a total of 80 farmers with 73 ha irrigated rice area situated at Brgy. Antipolo, Sariaya, Quezon, other members were considered as a potential new clusters for 2018 WS.

Potential new members of the SWG are NIA, IPB and Cropital. They will help the rice farmers in their rice and rice-based production and social capital which can increase their income.

3. Capacity Enhancement for Agro-enterprise Development

This study was conducted to enhance the technical capacity of farmers to improve their productivity, profitability and competitiveness in rice production, processing and marketing. Specifically, it aimed: 1) to promote the awareness of the farmers on "PalayCheck" System; 2) to help rice farmers understand the recommended and appropriate rice crop management practices; and 3) to encourage rice farmers in engaging rice farming into business. The study involves four activities namely: localization of training modules; training on rice production and marketing; training on values formation; and training on processing of rice and rice-based products.

"PalayCheck" System was used and promoted in trainings to enhance the farmers' awareness in different rice crop management practices. Series of trainings on introduction of Rice Business Innovation Systems, Key Checks, and soil analysis methods such as Minus One Element Technique and Leaf Color Chart were done from September to November in 2017. Both clustered and non-clustered members participated in the trainings. Training kit which includes notebook, pencil, list of rice varieties, "PalayCheck" kit, and Leaf Color Chart were given to farmer-participants.

The Farmers' Field School (FFS) approach will be initiated on January 2018 with a minimum of 100 rice farmers who will undergo technical capacity enhancement in order to enrich their knowledge in rice production. This will be conducted in partnership with the local government units of Sariaya, Quezon. Training on marketing, rice processing and rice-based products will be conducted after the FFS to enhance the farmers' readiness for market expansion. The capacity enhancement includes series of trainings on rice production and marketing, rice processing and rice-based products and values formation.

4. Developing Rice and Rice-based Enterprises for Smallholder Farmers

Enterprise development was conducted to support the RiceBIS community in increasing the income in rice production by 25%. The study aims to develop a rice and rice-based enterprise that can increase

the income of the RiceBIS farmers. The study used stepwise process of agroenterprise clustering approach of Catholic Relief Services. Steps involved in the study are the following: supply assessment and market chain study, agroenterprise plan and mobilization, product supply organizing and processing, test marketing and sustained enterprises.

Farmers were clustered based on the enterprise identified, however all of the farmers in the RiceBIS community identified wet palay as their product due to lack of infrastructure for post-harvest activities. Initial market scanning was done around Lucena and Pagbilao, Quezon. Price of palay offered by the millers are the same with the traders in the community. There will be no increase in the income of the rice farmers if they sold their produce whether to traders or millers if the product is wet palay. It is recommended that they partner with organization with facilities and infrastructure for the production of their palay into other form such as dried palay, milled rice, or brown rice to increase the value of their produce.

5. Monitoring and Evaluation

This study was conducted to monitor and evaluate the effectiveness, relevance, and impact of the project in establishing rice and rice-based agro-enterprise(s) in the community. The monitoring and evaluation plan for the RiceBIS Community in Sariaya, Quezon focused on the seasonal assessment and performance on rice production in the area. Collection of the baseline information of the clustered and non-clustered members were done to properly visualize the current scenario of rice farming in Brgy. Antipolo. Results showed that only 11.25% of the participants know what agro-enterprise was and 31.25% have an idea on group marketing. On the average, the participants were willing to commit 66.67% of their gross harvest to the program. Most of the farmers sell their produce right after threshing due to limited postharvest facilities in the area. In terms of labor and mechanization, crop care and maintenance has the highest quantity of labor used (41.22 man-da ha⁻¹) due to the regular field monitoring activity conducted by the farmers. Since 97.50% of farmers were using Farmers' seed, it greatly affected the production of palay in the area. The average yield during wet and dry seasons were only 3483.80 kg ha⁻¹ and 3829.25 kg ha⁻¹, respectively which were relatively lower when compared to the national average yield. The cost of producing 1 kg of palay in the area was 14.30 PhP and was 13% higher with the average cost per kg in the province. In terms of technology adoption, farmers were still using the conventional way of rice farming. Farmers' perception on rice farming as a business was low (3.43) and treat rice as subsistence farming. Farmers in the area were not yet ready to expand their market and venture into another business.

VIII. Localization of Knowledge Products and enhancing KSL Activities

CJM Tado, JLO Canilao, and JN Puerto

Knowledge, sharing and learning (KSL) is crucial in the extension of information from development workers to extension workers and to our primary clients, the farmers. Each PhilRice station is unique and they cater varying regions as well. The location of PhilRice Los Baños is strategic, as it is part of an active science community and the regions it covers- Regions IVA and IVB are characterized as transitioning to urban areas and as archipelagic, respectively. The main objectives of this study include developing schemes to transfer information on rice technologies to varying stakeholders of the station and by reproducing and distributing informational materials localized in the station. To enhance KSL activities in the station, the following activities were conducted in 2017: 1) conduct of a thematic quarterly seminar series composed of 4 topics and speakers; 2) promotion of programs and technologies using a social media account; 3) 55 technical dispatch of staff for external trainings and consultations; 4) station and educational tours of 700 farmer and student visitors; 5) management of 8 interns for production of localized KPs in the station; 6) promotion of the Be Riceponsible and Brown Rice campaigns in 6 exhibits; and 7) production, distribution and tracking of KPs year-round. Overall, the schemes seemed to be effective based on the evaluation and feedback collected.

Abbreviations and acronyms

ABA – Abscisic acid
 Ac – anther culture
 AC – amylose content
 AESA – Agro-ecosystems Analysis
 AEW – agricultural extension workers
 AG – anaerobic germination
 AIS – Agricultural Information System
 ANOVA – analysis of variance
 AON – advance observation nursery
 AT – agricultural technologist
 AYT – advanced yield trial
 BCA – biological control agent
 BLB – bacterial leaf blight
 BLS – bacterial leaf streak
 BPH – brown planthopper
 Bo - boron
 BR – brown rice
 BSWM – Bureau of Soils and Water Management
 Ca - Calcium
 CARP – Comprehensive Agrarian Reform Program
 cav – cavan, usually 50 kg
 CBFM – community-based forestry management
 CLSU – Central Luzon State University
 cm – centimeter
 CMS – cytoplasmic male sterile
 CP – protein content
 CRH – carbonized rice hull
 CTRHC – continuous-type rice hull carbonizer
 CT – conventional tillage
 Cu – copper
 DA – Department of Agriculture
 DA-RFU – Department of Agriculture-Regional Field Units
 DAE – days after emergence
 DAS – days after seeding
 DAT – days after transplanting
 DBMS – database management system
 DDTK – disease diagnostic tool kit
 DENR – Department of Environment and Natural Resources
 DH L– double haploid lines
 DRR – drought recovery rate
 DS – dry season
 DSA - diversity and stress adaptation
 DSR – direct seeded rice
 DUST – distinctness, uniformity and stability trial
 DWRSR – direct wet-seeded rice
 EGS – early generation screening
 EH – early heading

EMBI – effective microorganism-based inoculant
 EPI – early panicle initiation
 ET – early tillering
 FAO – Food and Agriculture Organization
 Fe – Iron
 FFA – free fatty acid
 FFP – farmer’s fertilizer practice
 FFS – farmers’ field school
 FGD – focus group discussion
 FI – farmer innovator
 FSSP – Food Staples Self-sufficiency Plan
 g – gram
 GAS – golden apple snail
 GC – gel consistency
 GIS – geographic information system
 GHG – greenhouse gas
 GLH – green leafhopper
 GPS – global positioning system
 GQ – grain quality
 GUI – graphical user interface
 GWS – genomwide selection
 GYT – general yield trial
 h – hour
 ha – hectare
 HIP - high inorganic phosphate
 HPL – hybrid parental line
 I - intermediate
 ICIS – International Crop Information System
 ICT – information and communication technology
 IMO – indigenous microorganism
 IF – inorganic fertilizer
 INGER - International Network for Genetic Evaluation of Rice
 IP – insect pest
 IPDTK – insect pest diagnostic tool kit
 IPM – Integrated Pest Management
 IRR – International Rice Research Institute
 IVC – in vitro culture
 IVM – in vitro mutagenesis
 IWM – integrated weed management
 JICA – Japan International Cooperation Agency
 K – potassium
 kg – kilogram
 KP – knowledge product
 KSL – knowledge sharing and learning
 LCC – leaf color chart
 LDIS – low-cost drip irrigation system
 LeD – leaf drying
 LeR – leaf rolling
 lpa – low phytic acid
 LGU – local government unit

LSTD – location specific technology development
 m – meter
 MAS – marker-assisted selection
 MAT – Multi-Adaption Trial
 MC – moisture content
 MDDST – modified dry direct seeding technique
 MET – multi-environment trial
 MFE – male fertile environment
 MLM – mixed-effects linear model
 Mg – magnesium
 Mn – Manganese
 MDDST – Modified Dry Direct Seeding Technique
 MOET – minus one element technique
 MR – moderately resistant
 MRT – Mobile Rice TeknoKlinik
 MSE – male-sterile environment
 MT – minimum tillage
 mtha¹ - metric ton per hectare
 MYT – multi-location yield trials
 N – nitrogen
 NAFC – National Agricultural and Fishery Council
 NBS – narrow brown spot
 NCT – National Cooperative Testing
 NFA – National Food Authority
 NGO – non-government organization
 NE – natural enemies
 NIL – near isogenic line
 NM – Nutrient Manager
 NOPT – Nutrient Omission Plot Technique
 NR – new reagent
 NSIC – National Seed Industry Council
 NSQCS – National Seed Quality Control Services
 OF – organic fertilizer
 OFT – on-farm trial
 OM – organic matter
 ON – observational nursery
 OPAG – Office of Provincial Agriculturist
 OpAPA – Open Academy for Philippine Agriculture
 P – phosphorus
 PA – phytic acid
 PCR – Polymerase chain reaction
 PDW – plant dry weight
 PF – participating farmer
 PFS – PalayCheck field school
 PhilRice – Philippine Rice Research Institute
 PhilSCAT – Philippine-Sino Center for Agricultural Technology
 PhilMech – Philippine Center for Postharvest Development and Mechanization
 PCA – principal component analysis

PI – panicle initiation
 PN – pedigree nursery
 PRKB – Pinoy Rice Knowledge Bank
 PTD – participatory technology development
 PYT – preliminary yield trial
 QTL – quantitative trait loci
 R - resistant
 RBB – rice black bug
 RCBD – randomized complete block design
 RDI – regulated deficit irrigation
 RF – rainfed
 RP – resource person
 RPM – revolution per minute
 RQCS – Rice Quality Classification Software
 RS4D – Rice Science for Development
 RSO – rice sufficiency officer
 RFL – Rainfed lowland
 RTV – rice tungro virus
 RTWG – Rice Technical Working Group
 S – sulfur
 SACLOB – Sealed Storage Enclosure for Rice Seeds
 SALT – Sloping Agricultural Land Technology
 SB – sheath blight
 SFR – small farm reservoir
 SME – small-medium enterprise
 SMS – short message service
 SN – source nursery
 SSNM – site-specific nutrient management
 SSR – simple sequence repeat
 STK – soil test kit
 STR – sequence tandem repeat
 SV – seedling vigor
 t – ton
 TCN – testcross nursery
 TCP – technical cooperation project
 TGMS – thermo-sensitive genetic male sterile
 TN – testcross nursery
 TOT – training of trainers
 TPR – transplanted rice
 TRV – traditional variety
 TSS – total soluble solid
 UEM – ultra-early maturing
 UPLB – University of the Philippines Los Baños
 VSU – Visayas State University
 WBPH – white-backed planthopper
 WEPP – water erosion prediction project
 WHC – water holding capacity
 WHO – World Health Organization
 WS – wet season
 WT – weed tolerance
 YA – yield advantage
 Zn – zinc
 ZT – zero tillage



Philippine Rice Research Institute

Central Experiment Station
Maligaya, Science City of Muñoz, 3119 Nueva Ecija

We are a government corporate entity (Classification E) under the Department of Agriculture. We were created through Executive Order 1061 on 5 November 1985 (as amended) to help develop high-yielding and cost-reducing technologies so farmers can produce enough rice for all Filipinos.

With a "Rice-Secure Philippines" vision, we want the Filipino rice farmers and the Philippine rice industry to be competitive through research for development in our central and seven branch stations, coordinating with a network that comprises 59 agencies strategically located nationwide.

We have the following certifications: ISO 9001:2008 (Quality Management), ISO 14001:2004 (Environmental Management), and OHSAS 18001:2007 (Occupational Health and Safety Assessment Series).

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