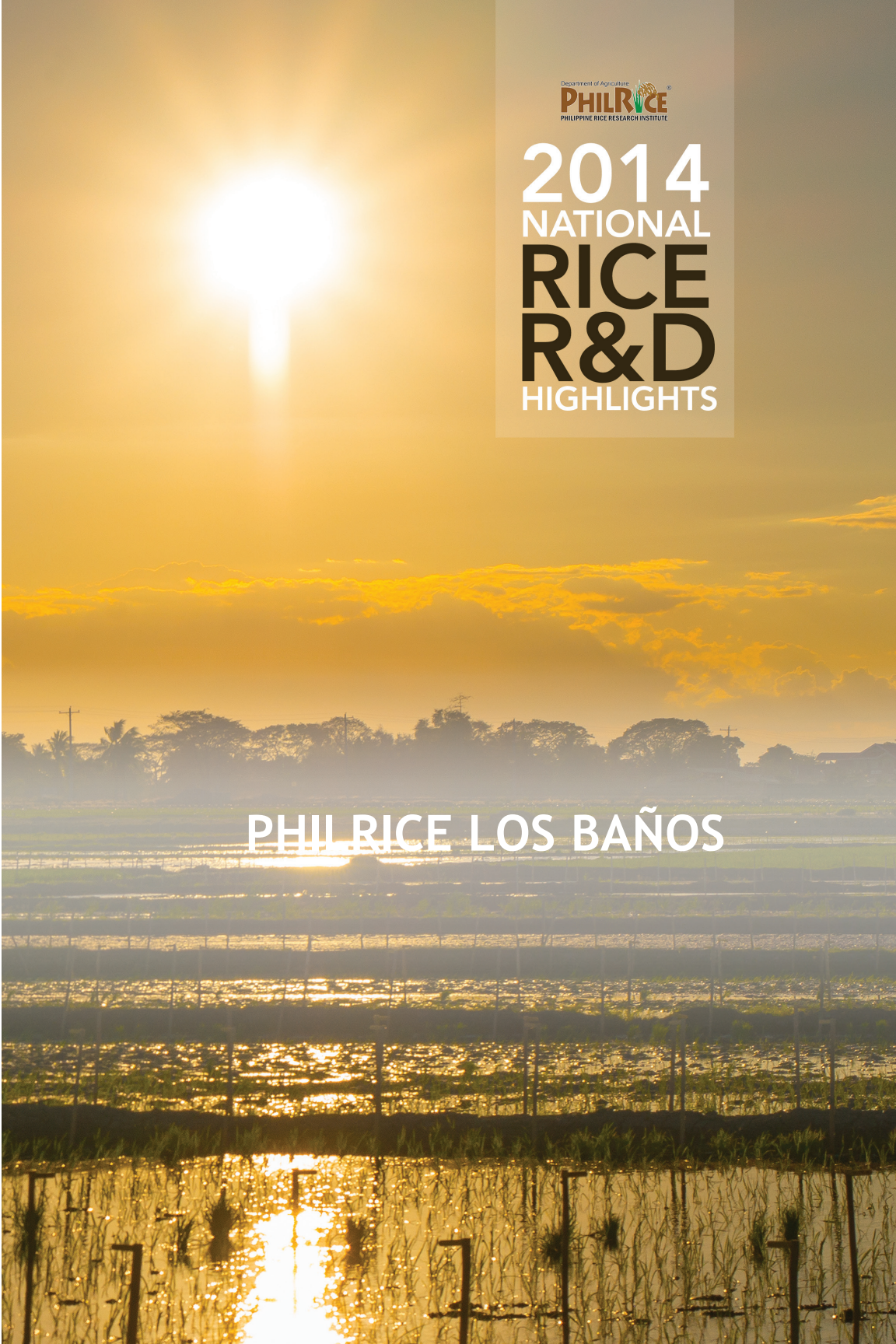

Department of Agriculture
PHILRICE
PHILIPPINE RICE RESEARCH INSTITUTE

2014 NATIONAL RICE R&D HIGHLIGHTS

PHILRICE LOS BAÑOS

TABLE OF CONTENTS

PhilRice Los Baños

Acting Branch Director: Diego Ramos

I. Harnessing the rice garden in promoting and enhancing rice awareness and appreciation in the urban setting

SP Razon and MM Movillon

Rice Garden is a simulated field showing actual rice plants of traditional and modern varieties at different growth stages. The project is envisioned to educate the general public about rice and its importance to Filipinos; its whole production spectrum from breeding to harvesting, recent technological improvements that can improve rice farming and enhance the quality of life of the Filipino farmer. The target audiences in particular are the youth, who are the country's future leaders, as well as the city dwellers that are less knowledgeable about rice farming and are often most vocal during rice crises.

The Rice Garden was established in 2001 at the Rizal Park in a 300 m2 terraced planting pad. This unique garden aims to increase awareness of urban dwellers, particularly the young on the significance of rice to the country's cultural heritage and way of life. The garden was inaugurated by the signing of Memorandum of Agreement among the Bureau of Plant Industry, DA-PhilRice, National Parks Development Committee, and the Asia Rice Foundation for its operation and maintenance.

For almost a decade, the rice garden is planted to traditional, modern and hybrid rice varieties. The ceremonial planting and harvesting are regularly conducted in which students, government officials and R&D people are invited.

Highlights:

- The Rice Garden was planted last July 2014 to three varieties with their respective yields, namely Mestiso 20 at 15 kilograms, PSB Rc18 at 8kg, and Inipot Ibon at 5 kg. Another batch comprising the same varieties have also been planted in December 2014.

- The year's highlight was a two-day activity, which included the Annual Ceremonial Harvesting at the Rice Garden on November 20-21, 2014, led by PhilRice Los Baños. Thirteen schools (9 elementary schools and 4 high schools) from District V of Manila and one pre-school from Pasig City as well as representatives from other organizations attended the ceremony. Around 500 students participated in the 2015 Rice Garden event.

- The two-part festivity consisted of three rice-themed competitions aimed at improving rice learning and appreciation among participating students, namely: Oil Painting and Rice Quiz Bee held on the first day, and Cultural Rice Dance held on the second day during the ceremonial harvesting program. The Ceremonial Harvesting is conducted yearly in support of the National Rice Awareness Month.

- An on-the-spot survey was conducted on 100 student participants on their perceived knowledge gain from the Rice Garden with the following results:
  - 88% learned about how an actual rice plant looks like;
  - 68% learned about rice cultivation;
  - 50% learned about rice varieties;
  - 93% learned about the value of Rice to Filipinos; and
  - 69% learned about the Be Riceponsible Campaign.

- A follow-up group interview to participating students from 4 elementary schools and 2 high schools showed mainly positive feedback on the rice garden for its effectiveness in promoting rice awareness among tourists and city dwellers who visit the area but suggests a more intensive promotion of the Rice Garden;

- More than half of the students interviewed were able to recall the Be Riceponsible messages two weeks after the event, most particularly *kilalanin at pasalamatan ang mga magsasaka, konti-konting kanin muna, and kakaibang kanin naman*.

Figure 1. Front view of the rice garden, November 2014.

Figure 2. Rice quiz bee, oil painting contest, cultural rice dance competition, and ceremonial harvesting 2014.

II. Palay-aklatan @ PhilRice Los Banos: One-Stop Philippine Rice Information Hub

RD Romainllos, JED Leyte, and HHB Manalo

The PhilRice station located in Los Baños, Laguna is mandated to cater to the needs of the stakeholders in MIMAROPA and CALABARZON. One of these needs is the need for Philippine rice and rice-related information as reflected in the number of station's visitors such as students and farmers who want to research on rice. To meet the need for information among stakeholders, the Palay-Aklatan ng PhilRice LB is being proposed. This Palay-Aklatan ng PhilRice LB will serve as one-stop Philippine rice information hub making the information readily available to stakeholders.

The Palay-Aklatan ng PhilRice LB will contain PhilRice publications, which include books, technology bulletins, magazines, etc; and manuscripts or thesis of PhilRice staff. Technology posters will be posted on the walls of the Palay-Aklatan ng PhilRice Los Baños to serve as information prompt. It will also house a computer with internet connection will be installed to promote online information available in PhilRice official website, Pinoy Rice Knowledge Bank, PhilRice official FB fanpage, and tweeter account as well as the NYR-related websites. Audio and visual presentations will also be available and will be played in the Palay-Aklatan ng PhilRice Los Baños. Also, in this area, the visitors will be encouraged to register to the PhilRice's

Farmers Text Center to promote the access of information using the mobile phones. This study aims at providing accessible, comprehensive and updated Philippine rice information to stakeholders; increasing the number of stakeholders who want to research on rice in PhilRice LB; determining the information on demand of the stakeholders; increasing stakeholders' awareness about PhilRice most especially the LB station; distributing PhilRice publications to libraries and reading rooms in UPLB; and updating list of PhilRice publications and BS/MS/ PhD manuscripts of PhilRice staff.

Highlights:

- Designed, and established a funcional mini-library at the BDD Sales Office (temporary). Final plan for the PalayAklatan have been designed to be implemented in 2015 at BDD Sales Office complementing the BDD products/machinery at BDD exhibits room;

- Requested 5 sets of books and other materials needed for the mini-library from DevCom, PhilRice CES;

- Established mini-library and distributed 3 sets of reading materials/knowledge product materials at the project sites in Balayan-Batangas, Magdalena,-Laguna and Genera Nakar/ OPA-Quezon;

- Inventory of the existing knowledge products and other reading materials (BS/MS/PhD Thesis and scientific publications) were conducted.

III. Palay-aralan para sa may patubig at katihan (Farmers' learning center for irrigated lowland and upland)

RD Romanillos, JED Leyte and MM Movillon

The "Palay-Aralan" is a simulated rice 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 study is envisioned to educate the general public about rice and its importance to Filipinos; 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 will serve as venue for training with various government agencies, SUCs and farmer groups and students.

The demonstration farm is located in AgriPark, IPB road, UPLB. This showcased the technologies developed by Philrice such as the PalayCheck System, leaf color chart and minus one element technique. Inaddition, it includes the demonstration of farming operations such as proper land preparation and different crop stages fromseedling until maturity (80-85%). To understand the technologies demonstrated, a monthly interval of planting/ crop establishment will be done to showcase the different phases of the rice crop. The demo farm's objective is to showcase and teach farmers, students and etc. about the different stages of the crop and location specific farming technologies and practicesin rice production. This in turn will enhance their knowledge in addressing issues in the farm and improve decision making skills in management. Moreover, students and other stakeholders will have awareness about the importance of rice as a daily staple and propose conservation measures to reduce wastage.

Highlights:

- The Palay-aralan demo farm for wet season showcased the different rainfed varieties (Figure 3 and 4). These varieties are found to be the important part of the demo due to the delay of rainfall and shortage of water supply in the rainfed and irrigated areas in CALABARZON.

- The major problem in the Palay-aralan is the continuous cropping which harbors pests and diseases. Leaf blight and tungro is found to be the most prevalent disease this season, however, there is no significant yield loss observed. Tungro virus is common in the area due to its previous history of being an experimental field for many decades. It is recommended to stop the infestation by planting a resistant variety for the next season, specifically a stop-gap variety. The Matatag lines can be used to stop the cycle of the disease but it should only be planted once to prevent the pest and disease resistance

breakdown of the line.

- The demo farm has low number of visitors. This can be attributed to the remote location of the area. It was only used during the on-station-training where participants did the actual land preparation, seedbed preparation and transplanting of seedlings. Inaddition, it was hard for the participants to do the early monitoring of pest because of the transportation constraints. In comparison, the upland area infront of the station has been used intensively by the UPLB students for rice awareness and performed the actual harvesting of rice and planting of munggo.

- To increase the number of visitors and to serve the purpose of the Palay-Aralan, it is recommended to formally invite schools and farmers to visit the learning center. This is part of the technology promotion that needs to be refurbished. Furthermore, active collaboration with different schools and farmer groups is needed so that the learning center can be continuously improved.

- Among the varieties planted PSB Rc72H yielded as high as 5.5mt/ha with a net income of PhP44,000.00.

Table 1. Rice Production Cycle of the Palay-Aralan in Agri Park 2014 Wet Season

Stages	Area (sq. m)	Variety	Yield (mt/ha)	Cost of Production (PhP/ha)	Gross Income (PhP/ha) (based on P18 /kg)	Net Income	Remarks
Harvesting	2,500	PSB Rc72H	5.5	55,000.00	99,000.00	44,000.00	
Flowering to Milking	2,500	NSIC Rc282	4.9	55,000.00	88,200.00	36,800.00	
Panicle Initiation to Flowering	2,500	NSIC Rc218	1.8	55,000.00	32,400.00	(22,600.00)	RTV Infected 40%
Tillering to PI	2,500	PSB Rc82	1.5	55,000.00	27,000.00	(28,000.00)	RTV Infected 60%
Ratoon	2,500	PSB Rc72H	1.5	8,000.00	27,000.00	19,000.00	

Figure 3. Palay-Aralan for Irrigated at AgriPark UPLB CES, 2014WS.

Figure 4. Plot 2 planted with NSIC Rc282 at AgriPark, UPLB CES, 2014WS.

Figure 5. Plot 3 planted with PSB Rc82 infected with Rice Tungro Virus.

Figure 6. Plot 4 planted with NSIC Rc218 infected with Bacterial Leaf Blight at AgriPark, UPLB CES, 2014WS.

IV. Palayabangan: The 10-5 Challenge in Los Banos

FS Aguilar and KCQ Saraos

The 10-5 Challenge aims to raise the rice production standard to 10t/ha yield at PhP5.00 input cost for every kilogram of palay produced. The participants are encouraged to use technologies and practices that can produce high yield at the same time low in production cost. The winner of the challenge has a chance to promote their technology using the prize of PhP5,000,000. The competition is open to individual rice farmer, farmer's group, Seed Company, Fertilizer Company, NGO or CSO, and state university.

The project supports the Food Staples Sufficiency Program and the advocacy of National Year of Rice which is to help the farmers increase their income and production.

The objectives of the study is to 1) Level up the rice production standard to 10-5; 2) Introduce and promote technologies and best practices on improving rice yield while reducing the production cost; 3) Boost the competitiveness of Filipino farmers; and 4)Put together key players in the rice industry.

Highlights:

- For dry season 2014, there are two competing entries composed of Fertilizer Company and Seed Company.
- Both Masinag and SL Agritech used SL-18H, variety produced by SL Agritech. The only difference is the technology used. Masinag used organic foliar with inorganic fertilizer while SL Agritech used purely inorganic fertilizer.

- Presented at the table below is the results for competing entries in dry season 2014:

Table 2. Technology and Results of Competing Entries for Dry Season 2014.

	Competing Entries for dry season	
	Masinag	SL Agritech
Category	Fertilizer Company	Seed Company
Seed Used	Hybrid	Hybrid
Variety Used	SL-18H	SL-18H
Maturity	115 DAS	115 DAS
Type of Planting	Transplanted	Transplanted
Age of Seedling at transplanting	17 DAS	18 DAS
Yield per Ha (fresh weight)	5.06 tons	6.45 tons
Cost/kg (Php)	14.12	11.41

- Given that the variety used for competing entries are the same, the yield is affected by the crop management, a 1.39t is the difference in the yield.

- For wet season 2014, the Palayabangan Monitoring Team in Los Banos Station coordinated with the office of the Provincial Agriculturist in Region IV-A to invite the rice farmers to join the challenge. But only Quezon Province had their representative. Batangas and Rizal Province are both interested but their concern is that the location of the demo plots is in PhilRice Station. It will be difficult for the farmers to travel from their province to Los Banos for the monitoring and operations. Therefore, only four competing entries composed of Fertilizer Company, Seed Company, and Gawad Saka Awardee participated.

- The fertilizer company, Zetryl.Chem Phils., Inc. has two entries as competing and non-competing entry. For the non-competing entry, the seed used is PSB Rc 82 that is transplanted at 21 DAS. The yield per ha is 2.92t with a cost/kg of PhP24.99.

- Presented at Table 3 are the results for competing entries during wet season 2014.

Table 3. Technology and Results of Competing Entries for Wet Season 2014.

	Participants			
	Bayer Crop Science	**Benedicto Malaluan**	**Syngenta Phils.**	**Zetryl Chem Phils., Inc.**
Category	Seed Company	Gawad Saka Awardee	Seed Company	Fertilizer Company
Seed Used	Hybrid	Hybrid	Hybrid	Inbred
Variety Used	Biqante Plus	SL-12H	Front Line Gold	PSB Rc238
Maturity	110-150 DAS	110 DAS	105-110 DAS	110 DAS
Type of Planting	Transplanted	Transplanted	Transplanted	Transplanted
Age of Seedling at transplanting	22 DAS	17 DAS	21 DAS	21 DAS
Yield per Ha (fresh weight)	4.93 tons	3.49 tons	6.58 tons	4.55 tons
Cost/kg (Php)	12.18	17.14	9.96	15.48

- Syngeta Phils. has the lowest cost in production, which is PhP9.96/kg of fresh harvest. Based from the mechanics of the game, the participant should at least achieved a 5 tons/ha harvest to be able to compete for the next season, lower than the set standard will be given another season to achieved it otherwise they can no longer compete for the upcoming season. Only Syngenta Phils. achieved the harvest more than 5t/ha therefore other contestants are given a chance to compete for the dry season 2015 but if the participants got lower than 5t, they are no longer allowed to compete for the next season.

- For PhilRice entries for dry season, four different technologies such as Nutrient Manager and MOET-Based under Research while Transplanted and drumseeded under BDD management.

- While for wet season, only BDD participate in the competition as non-competing entry. The technology used is transplanted using palay check system. The planned technology to be showcase is drumseeded but the weather condition at the time of crop establishment is not suitable.

- Presented at Table 4 are the results of all PhilRice entries for dry and wet season.

Table 4. Technology and Results of PhilRice Entries for Dry and Wet Season 2014.

	PhilRice Entries				
	Nutrient Manager	MOET Based	BDD Transplanted	BDD Drumseeded	BDD Transplanted
Season	Dry	Dry	Dry	Dry	Wet
Seed Used	Hybrid	Hybrid	Hybrid	Hybrid	Inbred
Variety Used	M 20	M 19	M 1	M 1	NSIC Rc218
Maturity	110 DAS	111 DAS	125 DAS	115 DAS	119 DAS
Type of Planting	Transplanted	Transplanted	Transplanted	Drumseeded	Transplanted
Age of Seedling at transplanting	21 DAS	21 DAS	22 DAS	-	29 DAS
Yield per Ha	5.96 tons	6.89 tons	5.49 tons	-	3.13 tons
Cost/kg (Php)	11.71	10.05	11.1	-	26.86

- For the past three cropping season no one hit the 10-5 challenge in PhilRice LB. As of now, only Syngenta Phils got the lowest production cost/kg which is P9.96 but the highest yield is still the MOET Based from research entry of PhilRice LB in dry season.

- Presented in Figure 7 are the documented activities during wet and dry season 2014.

Figure 7. Documented Activities A. Crop Establishment using Drumseeder B. Crop Establishment (Transplanting method) C. Pest Management (using power sprayer) D. Nutrient Management (1st Application of Inorganic Fertilizer) E. during Maturity Stage F. Hauling and Threshing of Palay.

V. Intensified Rice Based Agri Bio System (PhilRice Los Baños)

FS Aguilar, KCQ Saraos, DG Ramos and MM Movillon

Agriculture is a crucial sector for reducing poverty and attaining the Millennium Development Goals (MDG's), which includes halving the proportion of people in extreme poverty and hunger by 2015 (from its level in 1990). While the economy is growing, there may be a need to examine the agriculture sector more carefully; since official poverty statistics (dating as far back as 1985 up to the most recently released figures in 2009) show that the concentration of the poor has been in the entire agriculture sector. Many resources have been devoted by past administrations to agricultural modernization; the provision of agricultural inputs, and agrarian reform, but the Philippines continues to face a lot of challenges particularly to uplift the farmers out of poverty (NSCB 2012). Rice is a very important crop to every Filipinos. As an agricultural country, rice is the main staple and is being cultivated during dry and wet season which provides income and food to every Filipino people. CALABARZON region contributes 405,582 metric tons of the total annual palay production (PSA-BAS, 2014).

Innovative farming systems and farm management practices has been continuously developing all throughout the country. Success of these prevailing farming systems would be depending on the locality, whether it is adopted or not, whichever the society it serves might take depending on several factors that would affect each farming systems (Corales, 2013). Crop diversification and crop intensification is one way of farming technique wherein farmers can venture into. Maximum utilization of land use for added income and on the other hand, will help increase food supply that would be needed by the farming household. Another strategy would be the utilization of rice biomass just like rice straw in which many farmers would just burning them in the field not knowing of its benefits when being incorporated in the soil or used as substrates in organic composting procedure and use as beddings of substrates in mushroom production.

One of the program thrust of PhilRice, the "Intensified Rice Based Agri Bio System" or IRBAS, in which every station is mandated to be transform into one nuclei that will serve as the model in different crop management in diversification and intensification of rice based products as well as the maximum utilization of biomass such as rice straw for use as substrates in mushroom and vermiculture and vermicomposting production as nucleus components in order to help farmers in improving rice and rice based productivity and income and at the same time alleviate their status of poverty.

Highlights:

- Establishment of temporary mushroom production and vermiculture / vermicast production facilities at the station. Wet season rice production of NSIC Rc202H commonly known as Mestiso 19 were shown in Figures 8 to 10.
- Table 5 shows oyster and volvariella volvacea mushroom production and total vermicast and vermi worm production for two (2) production cycle of the project which was being utilized by the station in inbred rice production of BDD and rice production of the project. Some also being sold to the walk in farmer buyers.

Figure 8. Documentation of Vermicast and Vermiculture Production 2014.

Figure 9. Documentation of Osyter and Milky Mushroom Production 2014.

Figure 10. Documentation of NSIC Rc202H Rice Production Wet Season 2014.

Table 5. Vermicast / Vermiculture and Mushroom Production Output 2014.

PRODUCT (FIRST HARVEST)	QUANTITY PRODUCED	PRICE PER KILOGRAM	MARKET VALUE
AFRICAN NIGHT CRAWLER	116.50 KG	P350.00/KILO	P40,775.00
VERMICAST	1,719.00 KG	P7.00/KILO	P12,033.00

PRODUCT (SECOND HARVEST)	QUANTITY PRODUCED	PRICE PER KILOGRAM	MARKET VALUE
AFRICAN NIGHT CRAWLER	296.75 KG	P350.00/KILO	P103,862.50
VERMICAST	4,067.00 KG	P7.00/KILO	P28,469.00

PRODUCT	QUANTITY	AMOUNT
OYSTER	21.69 KG	P 3,550.00
VOLVARIELLA	0.55 KG	P 110.00

VI. Establishment of PhilRice Mindoro Satellite Office

MM Movillon, JM Fernandez, MFQ Austero

The proposed establishment of a PhilRice Satellite Station in Mindoro is eyed to increase the timely strategic distribution and production of high quality inbred-and hybrid rice seeds particularly in the MIMAROPA and CALABARZON regions. The Project proposes to establish a Satellite Station in Mindoro, which will involve rice R&D, with focus on the strategic production of high quality inbred and hybrid seeds, to cater to the needs and growing demands, particularly of the MIMAROPA and the CALABARZON. It serves primarily as a strategic production area, combined with rice-related studies and experiments and further showcasing new and modern rice- and rice-based technologies.

It will also showcase mechanized rice farming (practical usage/ application of hand tractors, mechanical transplanters, combine harvesters, sprayers, flatbed dryers and post-harvest facilities) among others. The station is geared to help enhanced farm productivity, increased farm income, increased volume of seeds and better accessibility of quality seeds to rice farmers and rice growers.

This Project will help strategize and accelerate the implementation of the Rice Sufficiency Program of the Department of Agriculture not only for the benefit of rice farmers/commercial seed growers and agricultural entrepreneurs, not only Mindoro, but also of those key players in CALABARZON and other MIMAROPA provinces.

Highlights:

- After the arrival of 2 assigned staff (Senior Farm Operations Manager Jessie M. Fernandez and SRS II Marion Francis Q. Austero) in MIDF (MAPSA Integrated Demo Farm) last February 2014 (DS2014), the Station established different experiments, production and demonstration fields such as:
  - Pushing for High Yield Potentials of Hybrid in Dry and Wet Season
  - On-Farm Evaluation of Hybrid Parental
  - A x R Seed Production Demonstration of Mestiso 7
  - S x P Seed Production Demonstration of Mestiso 20
  - Establishments of Farmers Learning Showcase Model

  This was showcased to Occidental Mindoro farmers and stakeholders last June 20, 2014 in the 1st PhilRice Mindoro Satellite Office and MIDF Farmers' Field Day in cooperation with the PLGU Occidental Mindoro, thru the OPAg and assistance of PhilRice LB, attended by 800 participants.

- Station established production, experiment and demonstration fields in in MIDF site (4 ha) and in the new Alacaak site (3.6 ha + 20 ha newly acquired) wet season 2014.

  MIDF Site:
  a. Production of Inbred Registered Seeds (2ha)
  b. Production of Foundation Seeds of Hybrid Parental (1 ha)
  c. Evaluation of 12 different hybrid parental on the time and duration of flowering
  d. Farmers' Learning Showcase Model
  e. Pre-evaluation Test of Growing Garlic

  Alacaak Site:
  a. Production of Inbred Registered Seeds (3.6 ha)
  b. Development of the newly acquired 20 ha land
  c. Lay-outing of area for Rice-Fish-Duck-Azolla Integration (0.5 ha)
  d. Preparation of the area for IRBAS Demo Fields

- Conducted its Groundbreaking Ceremony last September 11, 2014 cooperation with DA-RFO 4B and PLGU Occidental Mindoro, thru the OPAg, and assistance of PhilRice LB and PhilRice CES. Sen. Cynthia A. Villar, Cong. Josephine R. Sato, and Sec. Proceso J. Alcala led the ceremonies. ASec. Edilberto M. De Luna, Gov. Mario Gene J. Mendiola, Vice-Gov. Peter J. Alfaro, Mayor Felimon M. Galsim, Sangguniang Panlalawigan member, representatives of Atty. Jesus Abeleda Jr., the Land

Owner, and other rice stakeholders of Occidental Mindoro also witnessed the event.

VII. Establishment of Farmers' Learning Center in Occidental Mindoro

MM Movillon, JM Fernandez, MFQ Austero

The first part of helping farmers is to make them aware of new possibilities. Field demonstrations are an effective way to raise farmer awareness about new technologies options. In turn, farmers may then seek more information about a technology if they wish to try it. A field demonstration is usually established by researchers and/or extension workers—preferably in collaboration with farmers—to validate and demonstrate new technologies. Often new practices may need to be validated under local conditions and thus are demonstrated to farmers in researcher-led field demonstrations to raise farmer awareness about "new" technologies. Based on the demonstrations and subsequent interaction with farmers, some farmers may then choose to learn more about the technology in order to trial it.

For many long years, different DA-like agencies, established different field demonstration trials and experimental fields all over the country which include varietal trails, nutrient trials, different crop establishment methods, and others. Some tried a demonstration fields which showcases all the technologies in every rice stages in just one field like IRRI. IRRI established The Rice Garden Concept or continuous year-round rice farming. Rice Garden, intends to intensify the production by weekly planting and harvesting in the field.

The Farmers Learning Showcase Model (FLSM) is where the matured technology is laid out in order that drop by farmers and visitors can see and look the demonstrated technology of various crops. This method is so called "One Stop Shop Knowledge Gain" to which the farmers will adopt in order to improve their income in their farming activities.

Highlights:

- Established in MAPSA Integrated Demonstration Farm (MIDF) as a component and project within the temporary field of the PhilRice Mindoro Satellite Station.
- Established one FLC with 4 plots (vegetative, reproductive and ripening phase) as continuous rice production and showcase for technologies in rice production.
- Aimed that the FLC also showcase Palayamanan Farming so

planted different kinds of crops, vegetables and fruit trees around the FLC field as vegetable and fruit integration.

- Repair the pond around the field, and part of it devoted to azolla (Azolla Pinnata) production.
- Integrated 9 head ducks (6 female and 2 male), as GAS control in the field.
- Converted the grass land part of the area to Upland Rice Demo field, where different variety of upland rice (Kamuros, Risco, San Francisco, and Inipot ibon) was planted.
- Collected rice straw in the nearby field and establish mushroom beds for the production of native mushrooms.
- Renovated the shed near the field and converted it to Learning Shed of the station, where visitors were entertained.
- Showcased the field in the 1st PhilRice Mindoro Satellite Office and MIDF Farmers' Field Day in cooperation with the PLGU Occidental Mindoro, thru the OPAg and assistance of PhilRice LB, attended by 800 participants.
- Intensified the field by planting more vegetables after the harvest of upland rice and around the field.

VIII. Rural Transformation Movement

FS Aguilar, MM Movillon, KC Saraos, SM Cuevas, and SP Razon

The Rural Transformation Movement (RTM) is an initiative that mobilizes various expertise, organizations, and resources to rally and catalyze rural transformation with PhilRice as the lead agency. By rural transformation, we refer to a process that enables positive and relevant change in farmers' perceptions, attitudes, practices, and life chances with rice-based agriculture as a driver of inclusive and sustainable growth in the rural, farming areas.

The movement's goal is to improve farmers' economic as well as social and environmental well-being. Carrying a tagline Gusto Namin, Milyonaryo Kayo, RTM particularly takes a challenge of achieving 1 million (1-M) gross income per hectare per year through a combination of best practices in rice-based agriculture. Specifically, it will perform the following R&D activities: development and promotion of rice-based enterprises, production and distribution of agricultural inputs, capacity enhancement,

market analysis, socio-cultural research, as well as product development and packaging.

Unlike the conventional agricultural development programs, this campaign is behavioral change driven rather than a mere technology transfer. It is an action research campaign that aims to assess clients' readiness and provide strategies to guide them go through the stages of behavioral changes towards rural transformation. By realizing the 1-M income goal from rice-based agriculture, RTM hopes to contribute to the realization of President Aquino's 'social contract' with the Filipino people, that is, to address rural poverty, unemployment, malnutrition, environmental degradation, and climate change. It will not only intend to make farmers economically well-off but it will also nurture them with good values, such as community sharing, working for a common good, and respect for the environment.

The first phase of the research is social preparation, which entails opportunity and awareness-building during the first year of the campaign. Therefore, benchmarking, briefing activities and production, distribution, and installation of collaterals were the major activities undertaken from October to December 2014. A database of millionaire farmers as potential advocates has been generated and is continuously being built-up.

Highlights:

- Preparatory surveys and briefings from October to December 2014 were conducted among PhilRice Los Baños staff from the Administration, Research and Development Divisions, and other stakeholders including the Office of the Provincial Agriculturist, and leaders and members of the Puypuy Farmers' Association and Masaya Farmers' Association in Bay, Laguna.

- Two on-the-job trainees from PhilRice Central Experiment Station were deployed in December to the Los Baños branch to assist in the invitation, briefings, distribution of RTM collaterals, and establishment of stakeholder database for a week.

- Communication materials in the form of flag banners, t-shirts, posters, and other PhilRice-created knowledge products were installed and distributed to PhilRice Los Baños staff, partner local government units, farmers, and others.

- An interview and visit to a farmer-millionaire from Pila, Laguna was conducted.

IX. Farmer's perception, adoption pattern and constraint of using public and private released rice varieties in rainfed lowland ecosystems in Bicol region

FS Aguilar, JLO Canilao and MM Movillon

Research and development of modern high-yielding rice varieties in the Philippines is an important factor in achieving rice self-sufficiency, alleviating poverty and reduction of hunger. PhilRice, together with other public and private institutions, helps in the development of hundreds of modern high-yielding rice varieties with several crop management techniques and machines that are suited for local rice production agro ecosystems. Because of these initiatives, varietal released recommendations for rice for different agro ecosystems are made available. However, varieties cultivated may depend on farmer's preference in the adoption or non-adoption of these cultivars, particularly, in the different rainfed lowland environments. Depending on the preference, resources, and constraints that farmers face, a beneficial attribute for one farmer may be a negative one for another, or the balance between positive and negative traits may be acceptable for one farmer but not for the other (Bellon, 2001). Farmers' self-perception have gained more confidence in perceiving their knowledge in rice production increase, thus being able to provide better for their overall household needs.

Promotion of several rice varieties and varietal trials of public and private released rice varieties were widely done in Bicol Region. Documentation and benchmarking of these varieties as preferred by Bicolano rainfed lowland farmers needs further review. Examining the status of adoption of public and private released rice varieties and its contribution in rice production in rainfed lowland rice ecosystem in Bicol Region serves as this study's main objective.

Highlights:

- A total of 120 rice farmer respondents were surveyed in Barangay Poblacion in Pamplona, Camarines Sur; Barangays Villa Petrona and San Jose in Libon, Albay and Barangay Burabod in Castilla, Sorsogon disaggregated by municipality and province with the used of a well-structured questionnaire (Table 6). The survey activity collected information on farmers' socio-demographic profiles, basic farm characteristics, cropping patterns and farm yield, physical input utilization and input prices to come up with an assessment of farm level profitability.

- Documented rice varieties used across all sites are shown in

Table 7. Majority of farmer respondents in Barangay Poblacion preferred PSB Rc10 as planting materials for their rice production due to its availability and high yielding capacity. While in Barangays San Jose and Villa Petrona, farmers used PSB Rc18 mainly because of its high yielding capacity, resistance to pest and diseases and availability in the locality. On the other hand, farmers in Barangay Burabod preferred the traditional variety BPI 76, locally tagged as "Bulaw" because of its yellowish color, aroma, soft rice texture, good taste and resistance to pest and diseases.

- Completed analysis, tabulation and interpretation of study findings on the covered barangay sites in Barangay Poblacion in Pamplona, Camarines Sur; Barangays Villa Petrona and San Jose in Libon, Albay and Barangay Burabod in Castilla, Sorsogon.

- Completed terminal report for the study.

Table 6. Number of Rice Respondents by Barangay Site, by Municipality, and by Province, WS 2013.

Province	Municipality	Barangay Site	Number of Respondent
Camarines Sur	Pamplona	Poblacion	40
Albay	Libon	San Jose	19
		Villa Petrona	21
Sorsogon	Castilla	Burabod	40
TOTAL			120

Table 7. Frequency Count of Varieties Used by Barangay Site, by Municipality, and by Province, WS 2013.

Province	Municipality	Barangay Site	Variety Used	Frequency Count
Camarines Sur	Pamplona	Poblacion	PSB RC10	20
			BPI 76 (BULAW)	14
			NSIC RC222	11
			NSIC RC134	03
			NSIC RC112	01
			NSIC RC216	01
			NSIC RC238	01
			C4	01
			NSIC RC240	02
			RED RICE	02
			PSB RC79	01
			PSB RC18	01
			NSIC RC104	01
Albay	Libon	San Jose	PSB RC18	06
			RR4	01
			BPI 76 (BULAW)	02
			NSIC RC152	04
			PHB 77	02
			NSIC RC228	01
			NSIC RC222	04
		Villa Petrona	PSB RC18	07
			BPI 76 (BULAW)	02
			NSIC RC152	04
			LAGUNA	01
			SORSOGON	01
			NSIC RC122	03
			NSIC RC222	05
Sorsogon	Castilla	Burabod	BPI 76 (BULAW)	28
			MALAGKIT (PULUTAN)	05
			PSB RC10	07
			NSIC RC222	18
			SAMPAGUITA	01
			RED RICE	01
			PSB RC18	02

X. Upland palay-mayanan project (Upland Rice Techno-Munities)

RD Romanillos, JED Leyte, D Narvacan and A Jamorallin

PhilRice LB and DA-RFO 4A establish the PalayMAYANAN or Rice Techno-Munities in CALABARZON. The project serves as the upland model community supported with different interventions, community–based learning and research cum development activities. A development strategy that employs location-specific based learning approach as its foundation in promoting rice productivity, social advancement and transformation in selected rice producing areas. Farmers were invited to learn based on their own experience, evaluate, innovate and adopt the research generated technologies that will complements to effective, improve and enhance farmers resource based. It incorporates values enhancement and transformation to ensure farmer the full commitment of the farmers and other key development players in catalyzing the development in the countryside. Enabling the nucleus type of extension strategy of the DA-PhilRice where it follows a nucleic effect on the diffusion of rice technologies

Furthermore, it is also a venue where latest and updated technologies will be evaluated. The community will be provided with interventions such as seed support, mechanization, networking, and training as well as enhancement of policy, and credit access to enable farmers build business alliances.

Highlights:

- Courtesy call and project briefing was conducted in LGUs were the project will be established.
- There were four upland rice varieties planted with NSIC Rc23, Kinadyang, Ininot Ibon and Pinalawan in General Nakar and Magdalena.
- Established and maintained three (3) Pilot Demo Farm or Palay-MAYANAN model farm (Figures 11, 12 and 13).
- There were four upland rice varieties planted with NSIC Rc23, Kinadyang, Ininot Ibon and Pinalawan in General Nakar and Magdalena; Plants exhibited drought symptoms since no rain for almost 1 month.
- There were 20 farmers enlisted in Brgy Alipit, Magdalena, Laguna; 20 in Duhat, Balayan, Batangas; 18 in General Nakar, Quezon.

- Conducted weekly monitoring of the model farm, data on the daily Rainfall, air and soil temperature, agronomic data and yield, pest and disease incidence were also collected.

- Based on the initial variety demonstration trial conducted, it is found that no significant yield difference among traditional and modern upland varieties. Of the four (4) varieties planted almost all varieties performed well, especially NSIC Rc23 and Inipot-Ibon, with yields of 2.5 and 2.1t/ha, respectively (Figure 12) in Brgy. Alipit, Magdalena, while other two upland varieties yielded only 1.5 and 2.0, Kinandang and Pinalawan, respectively.

- No pest infestation and disease incidence was noted in the variety trial plots during the wet season cropping except for drought stress (Figure 12)

Figure 11. Site selection and validation Brgy. Duhat, Balayan, Batangas.

Figure 12. Upland rice affected by drought, 2014WS.

Figure 13. PalayMAYANAN model Farm at Minahan Norte, General Nakar, Quezon.

Figure 14. Upland Varietal Trial at Brgy. Alipit, Magdalena, Laguna, 2014WS.

XI. Establishment of Palayamanan Model Farms in Mindoro, Marinduque and Palawan

IDG Olvida, RC Veloso, KAMP Balingit, SMM Cuevas, MTB Carido, and RB Miranda

A frontier that has not been given focus is the development of the upland rice eco-system. It is community-based and mainly relies on farmers' local knowledge, particularly on the production protocol and planting calendar of the traditional rice varieties. The development of the upland rice eco-system is an opportunity to augment the country's rice supply as this production eco-system is located in the fringes of the rural areas. It is the source of rice, as a staple food, in communities where development is nil.

The Palayamanan System is selected to be the ideal form of intervention in order to uplift their socio-economic condition, address their issues of malnutrition, but still complementary to their traditional way of living. The Palayamanan Model farm showcases rice based farming technologies that will help improve the productivity and profitability of their farms.

Highlights:

For Occidental and Oriental Mindoro

- The uplands of Mindoro is the home of the of the indigenous people (IP) called the Mangyans whose subsistence–level livelihood is based on swidden cultivation of upland rice and root crops. The few with low lying farm land in rainfed areas have ventured into lowland farming, planting cash crops. Mangyan settlements are not accessible by road during rainy season thus depriving them of social services like education and health. Farming is the only livelihood they know. They live in poverty and malnutrition is high.

Sitio Sinagtala, Sta. Cruz, Occidental Mindoro

- The community of Iraya Mangyans composed of 15 families living together at the foot of Mt. Pibuto in So. Sinagtala, Brgy. Barahan, Sta Cruz, Occidental Mindoro truly needs assistance in developing their community, thus the establishment of a Palayamanan model farm in their area. The tribe is being led by their council of elders, led by Kuyay Roxas and Jose Lorenzo. The whole community owns a 3 hectare rainfed area. According to them, although they have such area, they still couldn't produce enough food from rice farming which they attribute to lack of inputs like seeds and fertilizers and the lack of knowledge in rice production. The problem is also

compounded by the scarcity of water during dry season which limit the cropping intensity and productivity of their farm.

The Palayamanan model farm was initially established in a 0.8ha area of their community, with the assistance of the Provincial Government of Occidental Mindoro through their Provincial Agriculture Office, and the Local Government unit of Sta Cruz through the Office of the Municipal Agriculturist.

- Initial field activity was started in 2013. Initial site validation and focus group discussions (FGDs) yielded the following observations
- Farm description: Total area of about 3 ha rainfed lowland farm for rice production. Yield is low at 0.9 ton per ha.
- Limited opportunities for development due to: extreme poverty, very limited farm inputs and implements, lack of access to arable land, need for enhancing technical agricultural knowledge, underemployment, and lack of education
- Community development and capacity enhancement project is strongly supported by both Provincial Local Government Unit, Municipal Local Government Unit, and the Office of the Mangyan Affairs.
- Six traditional (i.e. Pinungo, Buladlad, Dinorado, Azucena, San Fransisco and Camuros) and 3 modern varieties (PSB Rc272, Rc278, and Rc280) were planted on the site.
- Aside from the rice crop, vegetables like pole sitao and lady finger were also planted on the bunds to maximize the utilization of the area.
- The figure below shows the Palayamanan in Sinagtala several days after the establishment.

Figure 15. Palayamanan site establishment in Sitio Sinagtala.

During its first year of implementation, project implementers encountered the following challenges in project implementation such as: stakeholders' demand for food before participating, lack of tools, lack of initiative and drive to participate, and fluctuating attendance.

Due to this, the proponents of the project conducted a three-day capacity enhancement training with special focus on confidence building. The year 2014 sees the delivery of the different stakes of partners in the project implementation.

Sitio Lamak, Manaul, Mansalay, Oriental Mindoro

A 0.7 hectare Palayamanan model farm was also established in Sitio Lamak, Brgy Manaul, Mansalay Oriental Mindoro. It is also community-based as the upland farmers of the community helped in its establishment and maintenance, however it is being managed by farmer cooperator, Nahom Ihoy. Crop establishment in the site also started in 2013. Six

traditional rice varieties were planted in the area (i.e. Risco, Camuros, Pinungo, Pinolares, Azucena and Inipot Ibon), while vegetables like tomato, patola, eggplant and sitao were also sown.

- After the establishment, 25 farmer stakeholders have undergone a season long Upland Farmers Field School (FFS) conducted by the Agricultural Technicians from LGU and the newly trained local farmer technicians (LFTs).

- The Palayamanan served as their learning field.

XII. Anthropological and socioeconomic characterization of Bicol's Agta indigenous peoples: Phase 1 of enhancing the capabilities of Bicol's Agta IPs through Palayamanan approach

JLO Canilao, SMM Cuevas, FS Aguilar, MFQ Austero, IDG Olvida, MM Movillon

Poverty incidence is very high in Bicol's marginalized sector, which includes Indigenous Peoples (IPs) ethnolinguistically classified as Agta. To help the IPs be more food secure, this project aimed to enhance the productivity and income of the IPs through Palayamanan approach or diversified rice and rice-based farming system. Canilao et al. selected 4 IP study sites namely, Barangay San Pedro in Iriga City and Barangay Gatbo in Ocampo, Camarines Sur, Barangay Danao in Polangui and the clustered Barangays of Misibis, Joroan, and Mayong in Tiwi, Albay. Determining the anthropological and socioeconomic characteristics of Bicol's Agta IPs involved in upland and unfavorable rainfed lowland farming was done as part of the first study of the project. The characterization served as baseline information for researchers and development extension workers in the formulation of the project's second component, the Technical Phase.

Highlights:

- The last data validation was conducted on June 2014 in Barangay Danao and Barangays Misibis, Joroan, and Mayong. Respondents made a few clarifications and suggestions on the findings and recommendations presented. The topics refined included the number of rice farming experience, available potential rice farm areas, and the willingness of the IP farmers in the uplands of Barangay Mayong to participate in the next project phase.

- The results of the anthropological and socioeconomic analysis in San Pedro, Gatbo, Danao, and clustered sites of Misibis, Joroan and Mayong showed that IP communities across all sites demonstrated various geographical conditions, rice and agri-based farm practices, disposals, and lifestyle (Table 8). Major findings were the following:
  - IP farmers in Gatbo produced rice for commercial purposes, performed 2 to 3 cropping periods per year, had the advantage of only a 3km proximity to the market, and their rice yield comparatively higher than the rest of the sites.
  - San Pedro's isolated location in the uplands limited their capacity to sustain resources for farming and technical know-how. They aimed to revive rice farming as a means to secure food and good health for their family, especially for their youth.
  - Danao's location in the uplands placed their high rice production potential on hold due to its limited resources. Rice production remained solely for home consumption and farmers resorted to crop rotation to secure food in the community.
  - Barangays Misibis, Joroan, and Mayong, had very low rice production in the uplands, most of the IPs migrated in the lowlands to cultivate rice and where water for irrigation is available. Rice harvests were for personal consumption and abaca production remained the main livelihood activity in the community.

- Recommendations formulated for the 4 sites were the following:
  - For San Pedro, to establish a varietal demo field for upland rice and community seed bank, trainings on organic agriculture, and linkages with the Department of Environment and Natural Resources (DENR) for tree planting initiatives.
  - For Gatbo, to participate in capacity enhancement trainings through PalayCheck field schools and seek linkages with agencies in support for farm machinery.
  - For Danao, to conduct hands-on field school on upland rice technologies and efficient farming practices, varietal trial/adaptability of new and promising varieties for the upland, training on vegetable production (high value crops) and efficient nutrient management techniques to revitalize upland fields.

- For Misibis, Joroan, and Mayong, to coordinate with the Fiber Industry Development Authority for the up-scaling of abaca fiber production within the Dapdap Arc Cluster, conduct of PalayCheck Field School for farmers with irrigated rice fields, and conduct activities to generate interest of the youth in agriculture.

Table 8. Summary of the anthro- and socioeconomic findings for the 4 sites, 2011-2012.

ITEM/ DESCRIPTION	SAN PEDRO, IRIGA CITY	GATBO, OCAMPO	DANAO, POLANGUI	MISIBIS, JOROAN, MAYONG, TIWI
1. **IP Classification**	200 Agta-Cimarron and Agta-Tabangnon families*	71 Agta-Tabangnons and "Pure" Agta families	370 Agta-Tabangnon individuals	375 Agta, Agta-Tabangnon, Agta-Cimarron families
2. **Mean rice area (ha)**	0.87	0.92	1.27	0.49
3. **Palay yield (kg/ha dried at 14% MC)**	672 (WS 2011) 1187 (WS 2012)	2583 (DS 2012) 2479 (WS 2012)	495 (WS 2012)	1341 (WS 2012)
4. **Ave. Planting Seed Densities (kg/ha)**	34(WS 2011) 65 (WS 2012)	139 (WS 2011) 142 (WS 2012)	50 (WS 2012)	84 (WS 2012)
5. **Econ. Carrying Capacities (Food and poverty) for rice, agri and total agri & non-agri sources**	Less than 1	Less than 1	Less than 1	Less than 1
6. **Main purpose for upland rice production**	For home consumption	Supplementary supply to rice produced from lowland fields	For home consumption	For home consumption
7. **Current farming practices**	Traditional	Modern	Modern	Modern
8. **Lifestyle**	Shift from traditional to modern lifestyle in transition	IPs in the uplands were highly traditional; while the IP lowlanders have been fully assimilated with the non-IP residents	Non-cultural differences with the non-Agta. resulting in no particular conflict	Adaptation to the mainstream culture
9. **Reasons for limited upland rice production**	Lack of inputs in palay seeds and manpower	Lack of knowledge and time resource	Lack of palay seeds and problems in soil nutrition	Minimal land resource for rice production

Abbreviations and acronymns

ABA – Abscicic 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 – cystoplasmic 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
DWSR – 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
IRRI – 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
$mtha^{-1}$ - 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

List of Tables

List of Figures

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