Philippine Rice R&D Highlights 2013

SOCIO-ECONOMICS DIVISION

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SOCIO-ECONOMICS DIVISION

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The Socioeconomics Division (SED) implements socioeconomic and policy research and advocacy under the Office of the Deputy Executive Director for Development of the Philippine Rice Research Institute. Over the years, the national rice research and development has produced technologies and products that are expected to be beneficial to the Philippine rice-based farm households. SED is mandated to generate rice and rice-related statistics, measure the impacts of rice technologies, products, and services, and conduct policy research and advocacy activities. With these mandates, the division plays a crucial role in providing the necessary rice information to its stakeholders.

I. Rice Extension, Technology Awareness and Adoption in the Philippines: The RBFHS 2011 updates

Farmers' awareness toward rice farming practices is assumed to have impact on technology adoption. Hence, it is of interest to monitor the status of rice extension for farmers and the awareness it contributes to their rice farming practices. In March 2012, the Socioeconomics Division conducted the fourth round of the Rice-based Farm Household Survey (RBFHS) that covered information not only on social and economic profiles of farmers, but also on the reported technology awareness and adoption of 2,500 sample farmers from 33 major rice producing provinces in the Philippines.

Preliminary Findings:

Sources of information

- Providers are the primary source of information on rice farming from 2009-2011. Specifically, these are co-farmers (70%), LGU (48%), technician visits (38%), and DA-RFU (24%). But there are also 27% of farmers who are still using radio programs as their information source.

- On the other hand, information and communication technologies (ICT) are the least reported source of information. Less than one percent of farmers are accessing ICTs like internet (0.4%), videos (0.2%), CD/DVDs (0.2%), and OpAPA text messages(0.1%) as their sources of information.

- The most effective sources of information are co-farmers (23%), LGU (14%), technician's visits (13%), seminars/meetings (11%), and DA-RFU (8%). In Nueva Ecija, PhilRice is the most effective source of information as indicated by 36% of sample farmers (n=151) in the province. Figure 1 shows the most effective source of rice farming information as perceived by farmers in each province.

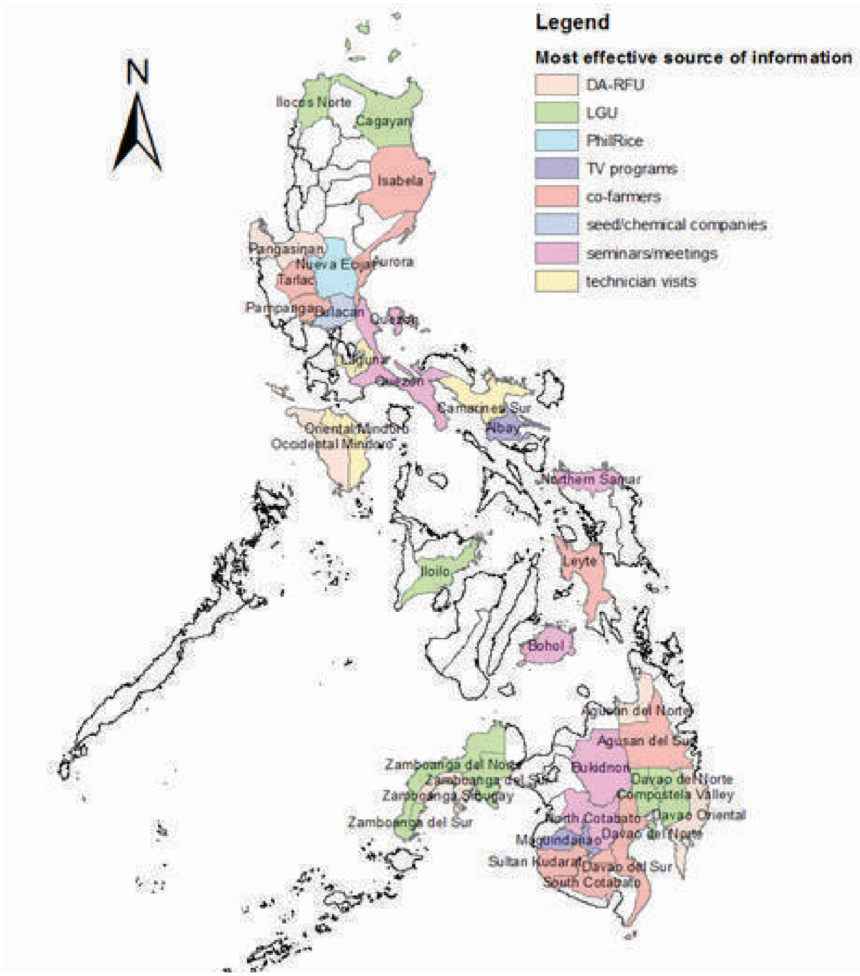


Figure 1. Most effective source of information on rice farming from 2009-2011

Information and Technologies on Rice

More farmers have access to information technology like cellular phone (79%). Most of them are willing to acquire rice information through text messages (74%) and internet (36%). But access to rice information seemed to be affected by their awareness of what certain sources or organizations are extending rice information through these media. In the case of PhilRice' service of providing rice information through text messages and internet, less than 30% of the farmers were aware of these services, and less than 10% had tried acquiring information through PhilRice text messages and OpAPA website.

Awareness and perception towards some rice farming issues

- Climate change and land conversion are known for majority of sample farmers and are perceived affecting rice farming negatively.

- More than half of the farmers (53%) know the rice self-sufficiency program. Among those farmers who are aware of this program, 74% perceived that it has positive effect in rice farming.

- Apparently, golden rice is notknown for majority of sample farmers (84%). But among farmers who are aware of golden rice, 46% perceived it has positive effect; 11% said it has negative effect; and 20% believed it has both positive and negative effect. Out of 409 farmers who are aware of golden rice, 227 (56%) said that they will consider planting golden rice.

Awareness and adoption of recommended rice farming practices/technologies

- Among the 26 recommended rice farming practices/ technologies listed in the RBFHS questionnaire, the most popular practices are as follows: thresh palay 0-1 day after harvest (95%), harvest palay when 80% of grains are ripe (89%), organic fertilizer application (88%), no high/low soil spots after leveling (87%), and straight row planting (84%).

- In contrast, the least popular technologies are minus-one element technique (24%), community trap barrier (32%), drumseeder for direct seeded rice (32%), rice hull carbonizer (33%), and agroecosystem analysis (33%).

- The most adopted rice farming practices/technologies are as follows: thresh palay 0-1 day after harvest (95%), harvest palay when 80% of grains are ripe (73%), no high/low soil spots after leveling (76%), synchronous planting (50%), and not burning of rice straw in the field (49%). It is observed from this result that the first three mentioned practices are also included in the most popular rice farming practices for farmers.

- On the other hand, the least adopted technologies are minus-one element technique (4%), drumseeder for direct seeded rice (3%), rice hull carbonizer (5%), carbonized rice hull (6%), and reaper (7%).

- For other technologies not mentioned above, awareness does not necessary imply adoption. Like in the case of riding-typehandtractor, almost half of the sample farmers (46%) are aware of it but only 8% are adopting the technology. For basal fertilizer application, 81% are aware but only 27% are practicing it. While 88% of the farmers know organic fertilizer application, only 27% of them used to apply organic fertilizer. Leaf color chart (LCC) is known for 36% of farmers but only 11% are using LCC. Reaper, one of the harvest management practices listed, is known for 40% of farmers but only 7% reported that they are adopting the technology.

- Table 1 shows the list of recommended rice farming technologies and the correspondingpercentof aware farmers and adopters.

Updating Rice and Rice-Related Statistics
GO Redondo and RF Tabalno

This study, in collaboration with the Bureau of Agricultural Statistics (BAS), intends to produce an updated edition of the Rice Statistics Handbook to include data from 2003 and so forth and present yearly updates of selected rice statistics in small booklet for use of researchers, planners, and policy-makers.

This study is very crucial as basis to support goal 1 in which to attain and sustain rice self-sufficiency and as data-base to serve as guide for policy-makers in their decisionmaking activity. The handbook has 3 volumes and includes the following data: 1 - Palay/Rice Supply and Demand; II - Input use, Production Costs and Returns, and Production Losses; and III – Palay/Rice Marketing.

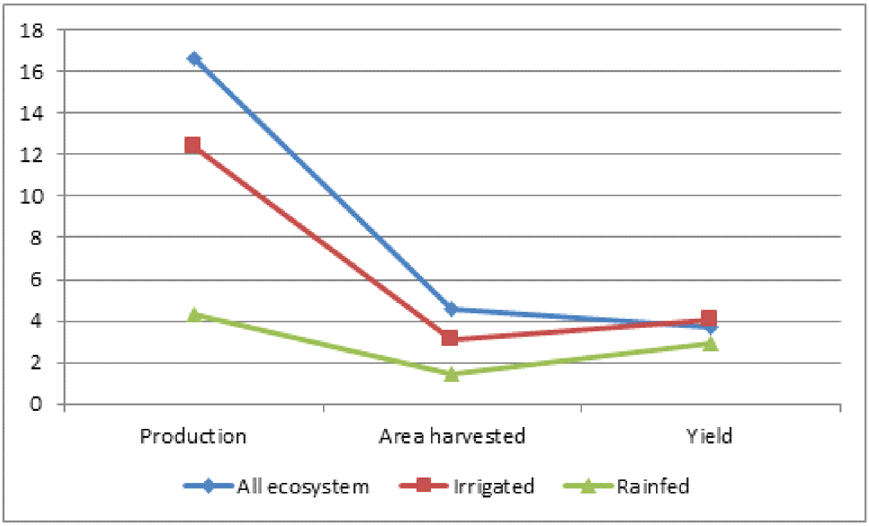
Primarily, this aims to continuously provide rice and rice-based statistical data and information to development planners, RD&E researchers and policy-makers, which will serve as a guide to sound decision-making on rice-related matters.

The study will be using secondary data. Existing data set on rice production and other related data will be tabulated and disaggregated at the provincial level. Compilation involves retrieval and organization of these data, estimated and validated by BAS. For data that are not available at BAS, these are requested and coordinated to other agencies.

SED staff will do the validation, editing and reviewing of output tables, which will be accompanied by a write-up. An electronic copy of the compiled data will be available at SED and these data will be published at the PhilRice website through DBMP.

Highlights:

Palay production in 2011 was 16.68 mmt. The irrigated area has a total production of 12.36 mmt and 4.33mmt for lowland rainfed. Due to favorable weather condition, our production increased by 5.78 percent over last year's production. Area harvested in 2011 was 4.54 mha, 4.35 mha in the irrigated, and 1.46 in the rainfed areas. Total yield per hectare was 3.72 mt, 4.22in the irrigated area and, 2.97 in the rainfed area.



The top 5 producing provinces were Nueva Ecija (1.31 mmt), Isabela (1.07 mmt), Iloilo (0.98 mmt), Pangasinan (0.98 mmt), and Cagayan (0.78 mmt).

Figure 2. Estimated production, area harvested and yield, Philippines, 2011.

Half of the farmer's produce were sold (50.65%) and only 23% were left for home consumption. Twenty percent were utilized for other purposes such as the harvester and thresher's share (14%), feeds, seeds, loan pay, irrigation fee, and wastage.

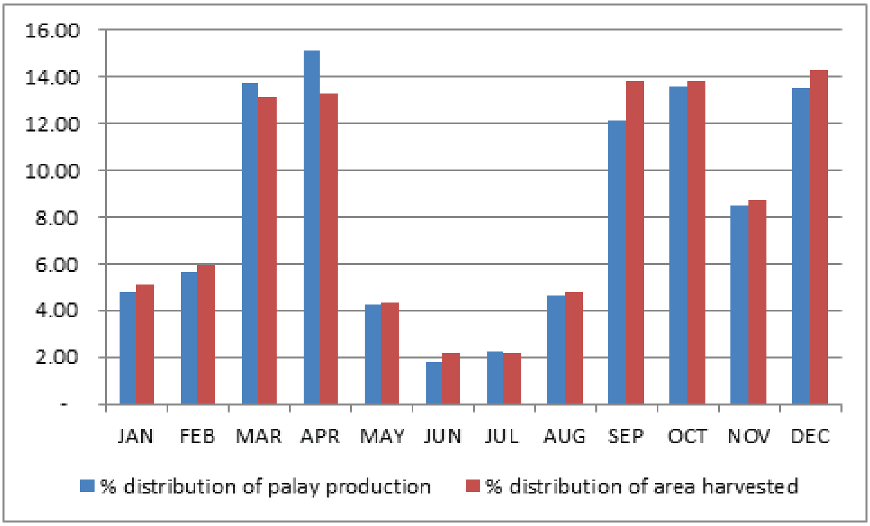


Figure 3. Monthly relative distribution of production and area harvested (%), Philippines, 2011.

Big volumes of rice were produced in April (15.13%) and, March (13.74%) for January to June harvest and September (12.10%), December (13.52%) and October (13.60%) for July to December harvest. During these months, there is increased in area harvested.

In 2011, the estimated physical area was 2,713,369 ha and its effective area was 4,536,642 ha with a cropping intensity of 1.67. Irrigated area occupies 37% of the total physical area. Effective area is twice bigger than the physical area where bigger lands were planted twice a year.

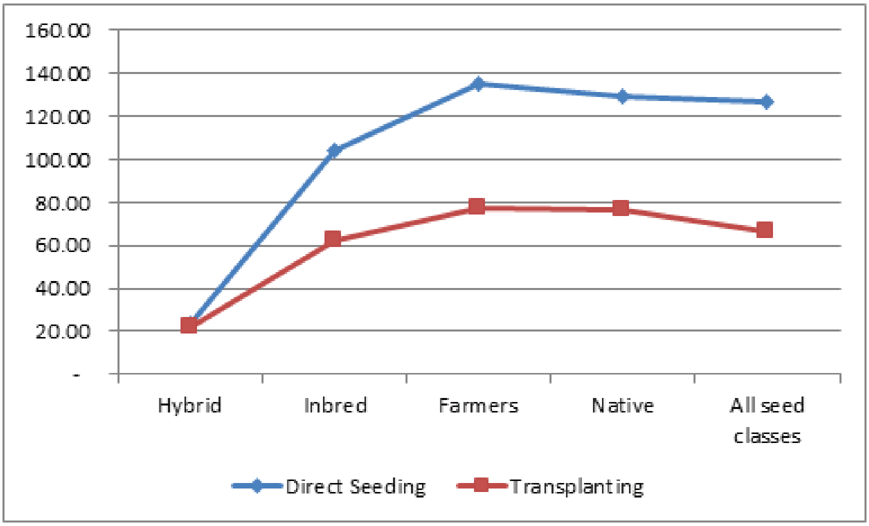


Figure 4. Estimated seed use by seed class and type of crop establishment per hectare.

There is no difference on the use of hybrid seeds either as direct seeding or transplanting. However, for other seed types, seed use was low using transplanting method than direct seeding. Using both methods, average seed use was 83.37, 66.24 for transplanting and 126.63 for direct seeding.(Note: kilograms per hectare?)

Overall, area affected was 763,722 ha and most of these were due to flashfloods and typhoons. Totally damaged was 136,223ha with production of 540,802 valued at 8,220,692 PhP.

Table 1. Estimated production losses, value, area affected and damaged by cause.

	Area Affected (ha)	Totally damaged (ha)	Production losses (mt)	Value of Production ("000PhP
All causes	763,722	136,223	540,802	8,220,692
Flashfloods and typhoons	747,797	134,094	530,216	8,059,950
Pests and diseases	15,116	1,696	8,850	138,972
Other causes	809	434	1,736	21,769

Total labor used in palay farms was 58.72 man-days and farm operation which has bigger labor for planting and transplanting (11.15 md), and harvesting (14.09 md) and crop care (7.83 md).

Table 2. Average labor operation in palay farms.

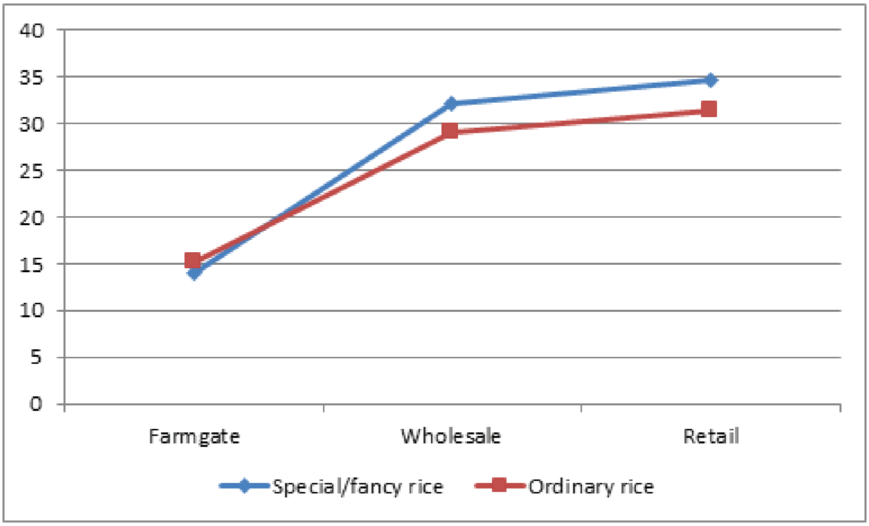
Activities	Man-days per hectare
Land preparation	0.38
Plowing	4.14
Harrowing	2.92
Levelling	0.32
Care of seedlings	0.01
Pulling & bundling of seedlings	4.85
Planting / Transplanting	11.15
Irrigation / Watering	1.98
Care of crops	7.83
Mechanical weeding	0.14
Manual weeding	4.44
Fertilizer application	1.59
Chemical application	1.66
Picking of snails	0.03
Harvesting	14.69
Threshing	4.50
Hauling	1.85
Drying	4.06
ALL ACTIVITIES	**58.72**

In 2011, total cost of palay production amounted to PhP41,179 per hectare with the irrigated area higher by 8%. Cash cost was computed at 58% of the total cost due to high cost in hired labor, fertilizer, pesticides, repairs and fuel and oil. Gross returns were PhP55,795 with the irrigated area higher by PhP5,309. Net returns were PhP14,616 with a net profit-cost ratio of PhP0.35. Cost per kilogram was PhP11.20 and the farmgate price is PhP15.17.

Table 3. Average palay production cost and returns, 2011.

	All Farms	Irrigated	Rainfed
Cash Costs	16,859	19,121	21,119
Non-Cash Costs	14,067	15,557	11,017
Imputed Costs	10,253	10,085	10,612
Total Costs	41,179	44,763	33,748
Gross Returns	55,795	61,104	44,812
Net Returns	14,616	16,251	11,064
Net Profit-Cost Ratio	0.35	0.36	0.33
Cost Per Kilogram In Pesos	11.20	11.13	11.42
Yield Per Hectare In Kilograms	3,678	4,022	2,954
Farmgate Price In Pesos Per Kilogram	15.17	15.17	15.17

For both rice type, retail price is higher than farmgate by one-half. In the case of the special palay, retail price is PhP34.93/kg while the farmgate price is PhP13.96 while the wholesale price is a little lower than the retail price. The same trend goes with the ordinary palay, the retail price is PhP31.31/kg, farmgate price is PhP13.16/kg, and wholesale price is PhP29.15/kg.



In 2011, our total procurement was PhP282,303 while our total injection was PhP977,479 which was lower than last year's palay procurement and injection.

Figure 5. Annual price of special/fancy palay/rice and ordinary palay/rice (PhP/kg), Philippines, 2011.

II. Adoption and Impact Evaluation of Rice R&D Products and Development Projects

Socioeconomic evaluation of deepwell pump irrigation system used in rice-based farming in Tarlac

CCLaunio, RG Manalili, KBAvila, ROTabalno and PMoya

This study aimed to evaluate the farm-level impact of using deepwell pump irrigation systems (DPIS), taking the case of the DPIS constructed under the Tarlac Groundwater Irrigation Systems Reactivation Project (TGISRP) completed by the National Irrigation Administration (NIA) in 2005. Using the "with or without" evaluation framework, we conducted a household survey comprising of 325 respondents--users of DPIS, shallow tubewells, and other water sources like rivers or creek. Pure rainfed farmers, those who depend solely on rain, were also interviewed to serve as control group. The household survey covered the 2011 DS and 2011 WS.

Highlights:

- Preliminary results of productivity and profitability by source of irrigation for the 2011 WS (Table 4) showed that the mean yield for those who sourced their water from NIA Casecnan canal and from the DPIS appear to be almost similar at 3.72 and 3.74 t/ha, respectively. Compared with the control group which is pure rainfed, the yield difference is 0.90 t/ha. On the other hand, the mean yield of STW users is 0.5 t/ha higher than the pure rainfed farmers.

- On production costs, results for the WS showed that while those who use the NIS canal incurred much lower fuel cost, they incurred the largest costs, particularly for fertilizer and hired labor costs. On a per kilogram basis, however, purely rainfed farmers appeared to be the most costly at PhP10.45 owing to the lower yield. Using deepwell appeared to result in the lowest cost per kg during the WS. On profitability, using DPIS for the wet season in the case of Tarlac appears to result in the highest net profit, followed by those who used NIS canal. Further analysis using regression and other statistical tests will be done to confirm these results.

Table 4. Comparative cost and returns analysis of rice production in Tarlac, by irrigation source, 2011 WS

	NIS Canal	Deepwell	STW	Rainfed
N	13	55	107	79
Average Area Planted (ha)	1.39	1.64	1.59	1.36
Average Area Harvested (ha)	1.36	1.52	1.49	1.26
Returns				
Yield (t/ha)	3.72	3.74	3.33	2.82
Price (P/kg)	10.71	10.71	10.71	10.71
Gross Returns (P/ha)	39813	40031	35706	30208
Costs (P/ha)				
Seed	2854	2299	2541	1889
Fertilizer	6670	5639	5974	4709
Pesticides	1053	843	764	947
Fuel and Oil	1281	2451	2229	925
Hired Labor	13417	11036	11122	10502
Permanent Labor	634	1875	1022	560
Imputed Labor	1114	915	1007	1589
Other Costs	5155	4240	6402	8354
Total Production Cost	32178	29298	31061	29475
Cost per kilogram (P)	8.66	7.84	9.32	10.45
Net Profit (P/ha)	7635	10733	4645	732
Net Profit-Cost Ratio	0.24	0.37	0.15	0.02

Economics of using shallow tubewells and open surface pumps in rice-based farming

CCLaunio, RG Manalili, RB Malasa and GO Redondo

This study aimed to (1) investigate the current use and management of irrigation pump use, (2) examine the factors influencing private investments in irrigation pumps and tubewells, and (3) assess the farm-level impacts of using shallow tubewell (STW) and open surface pump (OSP) especially in rice-based farming and relative to canal irrigation. Using the "with or without" evaluation framework, we conducted a household survey in 10 top provinces using irrigation pumps based on the results of the 2002 Agricultural Census and the Rice-Based Farm Household Survey.

Table 5 shows the number of farmers interviewed. The information gathered includes: sample farmer characteristics, farm profile, cropping patterns, technical information and characteristics of pump sets and tubewells used, pump-use and water management, input-use and costs and returns data.

Table 5. Sampling for irrigation pump survey, 2012-2013

Province	STW	STW/OSP	OSP	Rainfed	Total
Cagayan	43		17	15	75
Camarines Sur	11		49	15	75
Ilocos Norte	50	1	9	15	75
Iloilo	26	1	33	15	75
Isabela	50		10	15	75
Nueva Ecija	47	3	10	15	75
Oriental Mindoro	42		18	15	75
Pampanga	44		16	15	75
Pangasinan	41	2	17	15	75
Tarlac	55	1	4	15	75
Grand Total	409	8	183	150	750

Baseline Assessment and Seasonal Monitoring of PhilRice-JICA Technical Cooperation Project Phase 5

FH Bordey, RC Gulen, JC Beltran, and JLE Duque

This study aims to establish the accomplishment of the fifth phase of the Technical Cooperation Project (TCP) between PhilRice and JICA. To do this, baseline data on farmers' yield, income, and technology adoption were compared to monitoring data, which were gathered after the target beneficiaries underwent the training sponsored by the TCP. A group of non-participants was also monitored to be used as benchmark for measuring the changes among beneficiaries. In 2012, baseline data were gathered from 255 beneficiaries but only 241 beneficiaries were monitored in 2013 since some of them did not finish the training. On the other hand, only 61 out of 63 non-participants were interviewed again in 2013.

Average rice yield of beneficiaries has increased by 44% from 2.51 mt/ha in 2012 to 3.62 mt/ha in 2013 (Table 6). This has contributed to 57% increase in their gross revenue from rice farming. In comparison, non-participants' rice yield has declined from 2.72 mt/ha to 2.51 mt/ha. Despite this, average gross revenue of the non-participants decreased only by 1% due to the higher price of paddy rice confronted by non-participants in 2013.

The cost of producing a kilogram of paddy among beneficiaries has risen from PhP 12.20 to PhP13.91 whereas that of non-participants has increased from PhP12.55 to PhP15.98. Because of the smaller increase in the production cost per unit, beneficiaries received higher returns above variable cost at PhP10.00/kg per kilogram in 2013 compared to PhP7.17 in 2012. The high price of paddy led to increase in non-participants' returns above variable cost from PhP8.04/kg to PhP9.07/kg, albeit at smaller magnitude compared to change in beneficiaries' returns per unit.

Fertilizer costs per hectare of beneficiaries and non-participants have both increased due to higher fertilizer application. Nevertheless, the increment in fertilizer applied by beneficiaries is larger than that of non-participants. Meanwhile, pesticide cost of both groups has declined.

The TCP targets that 70% of beneficiaries will adopt at least 15 technologies and good practices on rice production. During the baseline period, none of the 20 rice technologies promoted by the TCP were adopted by 70% of the beneficiaries and non-participants. The three practices mostly adopted by beneficiaries are: (1) harvesting of grains when 80-85% of grains are ripe (45%); (2) not burning of rice straw (42%); and (3) use of recommended varieties (40%). Non-participants also adopted most of these technologies but at lower rates.

One year after the training, more than 70% of beneficiaries already adopted 11 out of 20 rice technologies. These technologies are: (1) use of recommended varieties (75%); (2) at least 21 days of land preparation (72%); (3) no low and high soil spots after final leveling (96%); (4) synchronous planting (74%); (5) proper plant spacing (83%); (6) no spraying for defoliators within 30 days after transplanting or 40 days after sowing; (7) practice of agro-ecological system assessment (72%); (8) harvesting of grains when 80%-85% of grains are ripe (94%); (9) threshing of paddy not later than one day after harvest (76%); (10) scattering the rice straw in the field to decompose (71%); and (11) not burning of rice straw (76%). Only the good practice on harvesting was adopted by more than 70% of non-participants during the monitoring period.

Table 6. Partial Budget Analysis for Rice Production in PhilRice-JICA TCP5 sites in ARMM.

E

III. Policy Research and Advocacy (PRA)

JC Beltran

The project intends to strengthen the link between research and policy-making, hence intensifying the rice policy advocacy activities of the Institute. To do this, the PRA will employ proactive methods such as information campaigns, publication of policy notes, media releases, sponsoring rice forums, and making socioeconomic studies and database on rice available in the internet. The project will ensure that most, if not all, information relevant for rice policy -making and decision-making are available when or before it is needed. Through the availability of information, the PRA project also hopes to help the policy-makers and decision-makers to create a favorable policy environment toward the development of the rice industry. Specifically, the project aims to: (1) create favorable policy environment for harnessing the applications of rice R&D; (2) understand the existing and emerging issues surrounding the rice industry from production to utilization; (3) analyze the supply chain or structure, conduct surveys on the performance of selected input markets; (4) conduct market analysis of selected value-added rice products; and (5) to formulate and advocate policy actions that will address these issues.

In 2013, the project conducted three studies that addressed different concerns on rice policies and marketing of rice production inputs.

For rice policy concerns, a policy brief on rice smuggling issue in the Philippines was published. This publication discussed the nature of rice smuggling, the negative effects of smuggling, the current anti-smuggling measures of the government, the reasons of traders to smuggle, and suggestions for its long-term solution in the country. In addition, a policy seminar on managing demands toward rice self-sufficiency was conducted. The seminar was held to create an avenue for discussion on the demand-related components of rice self-sufficiency. As for the marketing of rice production inputs' concerns, a compendium of the list of rice and rice value-added products as well as its uses was prepared. Also, a detailed study on the marketing practices and performances of rice seed industry was conducted. Area of seed production, productivity and preferred varieties planted of seed growers were some of the areas discussed. Details of the major accomplishments of the project are outlined as follows:

Linking Rice Research to Policy and Action
AC Litonjua, FH Bordey, SJC Paran, DL Kitongan, FB Lamson, and MGLayaoen

This study serves as an active advocacy arm of the PhilRice's socioeconomic and policy researches. A lot of information from these researches is already available in papers. However, to create a tangible impact to the rice sector, this has to be delivered to its intended users, like the policy-makers. This information can serve as their guide in creating relevant policies, programs, and projects for the rice sector. Hence, this study was created to strengthen the link between socioeconomic and policy researches and policy-making.

Highlights:

- First, an issue of the policy brief Rice Science for Decision-makers was published. The article is titled "Curing the Cause Rather than the Symptom: the Case of Rice Smuggling in the Philippines." This publication discussed the nature of rice smuggling in the Philippines. Specifically, it talks about the negative effects of smuggling, the current anti-smuggling measures of the government, the reasons of traders to smuggle, and suggestions for its long-term solution.

  The preparation of this article involved intensive literature review and consolidation of data gathered from the Bureau of Customs, Bureau of Agricultural Research, related literatures, and from an ongoing project that benchmarks the rice economy of selected rice-producing countries in Asia. This was prepared and released mainly as an aid to policy-makers in addressing rice smuggling. This was also provided to PhilRice management and selected staff and DA officials as reference for their programs/projects.

- Second, the study team together with the National Year of Rice Program team organized and hosted a policy seminar titled "PALAY, BIGAS, KANIN: Managing Demand Toward Sufficiency." This was held on November 13, 2013 in Manila and was attended by representatives from the private and government sectors, non-government organizations, political parties, and international institutions. The event was held to create an avenue for discussion on the demand-related components of self-sufficiency. As observed, majority of government interventions on rice self-sufficiency involve production support services and only few dealt on its demand components. Hence, topics and discussions focused on the demand components of self-sufficiency. Additional ways to further manage the use of rice can be derived from the discussions.

Specific objectives of the event were to: present the status of supply and utilization of rice in the country; identify the factors affecting per capita rice consumption; determine the factors that influence rice demand changes; review the trends in table wastage; present the existing strategies to reduce table wastage; determine the status of postharvest losses and the strategies for its reduction; identify the factors affecting seed-use; and consolidate policy recommendations for consideration of policy-makers. The speakers and the topics presented in the seminar are the following:

a. Status of the rice supply and utilization of rice by Ms. Carol G. Duran, Officer-in-Charge of the Agricultural Accounts and Statistical Indicators Division (AASID), DA-Bureau of Agricultural Statistics (BAS)
b. Factors affecting per capita rice consumption by Mr. Eduardo B. Sanguyo, Chief of the Socioeconomics Statistics Section of the AASID
c. Determining the factors that influence rice demand changes by Dr. Merceditas Sombilla, Director of the Agriculture, Natural Resources and Environment Staff of the National Economic and Development Authority (NEDA).
d. Trends in table wastage by Dr. Mario V. Capanzana, Director of the Food and Nutrition Research Institute (FNRI).
e. Existing strategies to reduce table wastage by Ms. Hazel V. Antonio, Program Director of the National Year of Rice 2013.
f. Postharvest losses and strategies for its reduction by Dr. Renita SM dela Cruz, chief researcher at the Philippine Center for Postharvest Development and Mechanization (PHilMech).
g. Factors affecting farmers' seed-use by Mr. Ronell B. Malasa, a science research specialist at the Socioeconomics Division (SED) of the PhilRice.

The seminar proceedings and the summary of important matters discussed are still being prepared. This will be provided to attendees, policymakers, DA officials, and other information users in 2014. Meanwhile, the proceedings of the 2012 policy seminar titled "Philippine Rice Trade Policies and Rice Security: Future Directions" has already been drafted. However, this is still being improved for publication.

Inventory of Value-Added Products from Rice in the Philippines
GO Redondo, CC Launio, AC Litonjua, RF Tabalno, JC Beltran and staff from PhilRice Branch Stations

The study intends to consolidate all available information on the existing value-added products from rice and rice by-products whether for food, pharmaceutical, cosmetic, energy or other uses. Specifically, the study aims to: (1) assemble information on existing and potential uses of rice, rice bran, rice husk and rice straw based on publication review; (2) conduct an inventory of the existing use/s of rice, rice bran, rice husk and rice straw by industries/manufacturers in the Philippines; (3) determine the location of manufacturers and major production areas for value-added products using rice, rice by-products, and rice straw; and (4) draw policy and research implications based on generated information.

The study used both primary and secondary data. For the primary data, a mailed survey for the manufacturing industries of value-added rice products in the Philippines was done. An actual product survey was also done in major supermarkets/mall and major markets in the country in collaboration with selected personnel in PhilRice branch stations. Collected data from each firm included the name of product, uses of rice, rice bran, rice hull or rice straw, average volume used per unit of product, and product marketing outlets. In addition, key informant interviews were done to cover traditional and other potential products in the country, get the list of other key/major players in the specific industries, and derive other information not available from published documents.

As for the secondary data, these were collected from different agencies in the country such as Department of Trade and Industry (DTI) and Department of Agriculture (DA) and from published research and different websites in the internet. These data were used for the inventory of current and potential uses of rice and its value-added products as well as for the compilation of the list of import and export rice products from concerned agencies.

A total of 194 samples were interviewed from the three types of outlets. Majority of the samples came from Central Luzon, Northern Mindanao, Cagayan Valley, and from the Ilocos regions. Specifically, most of the samples of the wet market survey were collected in Cagayan Valley, Northern Mindanao, and Davao Regions while for the samples of the mailed survey they mainly came from Central Luzon and Ilocos regions. In terms of the actual survey of mall/supermarket, majority of the samples visited were located in Northern Mindanao, Caraga, Central Luzon and Davao Regions. As for specific provinces visited in the region, the number of samples ranged from 1-4.

Highlights:

- Table 7 presents the list of rice value-added products in the Philippines by major outlets. Results of the mailed survey show that the top five rice value-added products from the three types of outlets were snacks, meals and snacks, snacks/appetizer, seasoning, and meals for infants. Results also show that the majority of the products made from rice were snacks, meals and snacks, and beverages and drinks (coffee and wine). Based from the wet market survey, results show that the most commonly sold rice products in the market were different kinds of snacks such as rice cakes or "kakanin", meals and snacks (different kinds of "suman" and "pancit"), and rice. Moreover, the actual survey on famous supermarket or mall reveals that snack was the most common rice products followed by snacks/appetizer and meals and snacks.

- Based on the three surveys, the most common uses of rice were for food, snacks, and food and snacks. Specifically, these were the white rice or glutinous rice which was cooked as a whole (e.g. "biko", "bibingkang suman" and "tamalis"), grinded (e.g. "bibingkang galapong", "espasol", "suman muryekos", "puto" and "cutchinta"), and pounded (e.g. "pinipig"). Rice was also grinded and prepared for rice coffee, rice tea, and packaged mixes such as adobo mix, caldereta mix, kare-kare mix, rice mate, and rice flour. Rice is also an important ingredient for baby foods and cereal drink.

- Rice hull and rice straw are very important particularly to those who are raising animals as feed additives and as bedding for chicken to act as moisture absorbent. Based on the survey, these were used for mulching vegetables and mushroom and materials for firing in cement industry, clay pots making, and in making iodized salt. Additionally, the rice straw was used in making organic fertilizer and as a bedding material for mushroom. The burnt rice hull which is commonly known as the rice ash was used as an organic fertilizer for plants.

Table 7. List of rice value-adding products in the Philippines by major outlets.

Value-adding products	Wet market survey		Mailed survey		Actual survey (Supermarket/mall)		TOTAL	
	N	%	N	%	N	%	N	%
aby food			1	0.83			1	0.05
everages and drinks	10	2.49	10	8.26	2	0.13	22	1.09
ereal drinks					107	7.11	107	5.28
ondiments	2	0.50	1	0.83	4	0.27	7	0.35
ooking					1	0.07	1	0.05
ooking/baking	4	1.00	1	0.83	14	0.93	19	0.94
nergy drink					21	1.40	21	1.04
eed additives	12	2.99	9	7.44			21	1.04
ood	41	10.22	3	2.48	34	2.26	78	3.85
ood supplement					1	0.07	1	0.05
ood wrapper					4	0.27	4	0.20
or bedding (chicken, mushroom, plants)			5	4.13			5	0.25
or easier drying of clay pots			1	0.83			1	0.05
or firing (clay stoves, cement industry, making iodized salt)			5	4.13			5	0.25
eals and snacks	53	13.22	15	12.40	202	13.43	270	13.33
eals for infants					141	9.38	141	6.96
ulching (okra, onion)			3	2.48			3	0.15
sed in the preparation of organic fertilizer			3	2.48			3	0.15
aper box			1	0.83			1	0.05
emixes			1	0.83			1	0.05
eservative	1	0.25	3	2.48			4	0.20
et food	2	0.50	1	0.83	36	2.39	39	1.92
ce conditioner					18	1.20	18	0.89
easoning					167	11.10	167	8.24
de dishes	3	0.75	1	0.83			4	0.20
nacks	273	68.08	56	46.28	534	35.51	863	42.60
nacks/appetizer					218	14.49	218	10.76
pecial paper sheet			1	0.83			1	0.05
otal	401	100.00	121	100.00	1504	100.00	2026	100.00

- Table 8 presents the top rice value-added products across the regions. Result shows that among rice cakes, the “bibingkang kanin” was very common in Regions 2, 3, 4a and 11. The “biko” rice cake was popular in Region 8 and 11. Famous rice cakes that are made of glutinous rice were “patupat” and “tupig” in Region 1. In Region 2, the popular rice cakes were “tupig”, “bibingkang galapong” and “suman inangit”. In Region 3, “espasol”, “bibingkang pinipig”, “biko”, “suman sa lihiya” and “tamales” were the common rice cakes. The “puto bigas” was usually found in Region 4b, while “puto” and “plain suman” were popular in Region 5. Rice cake, puto cheese, pop rice and ampao were popular in Region 6. Region 7 was famous for their “tikoy pandan” and “ampao”, while rice flour for Region 8 and puto maya for Region 10 and Caraga.

Table 8. Top value-added products by region

Region	Products
CAR	Rice wine, Tabuk rice wine
Region 1	Patupat, tupig, Nova multigrain snacks
Region 2	Bibingkang kanin, tupig, bibingkang galapong, buro, suman inangit
Region 3	Bibingkang kanin, espasol, bibingkang pinipig, biko, suman sa lihiya, tamales
Region 4a	Rice noodles, bibing kangkanin, glutinous rice flour, bihon, champ-o-rado mix, tuna paella
Region 4b	Potato chips, puto bigas, cerelac baby cereal, glutinous rice flour, milo overload
Region 5	Puto, suman (plain), kare-kare base mix, rice mate, sapin-sapin
Region 6	Pop rice, ampao, kwakoy, puto cheese, rice cake, rice roll
Region 7	Tikoy pandan, ampao
Region 8	Rice flour
Region10	Cloud 9 berry burst, biko, suman (plain), putomaya, big bang, nova multigrain snacks
Region 11	Fish cracker, biko, cloud 9 berry burst, season n' fry coating mix, bibingkang kanin
Region 12	Fish cracker, season n' fry coating mix, snitch chocolate, cerelac, nova multigrain snacks
Caraga	Puto maya, big bang, cerelac, cloud 9 berry burst, nova multigrain snacks

- Aside from meals, rice was used in preparing delicacies, snacks, and processed products. Producers used white or glutinous rice to cook rice cakes such as "biko", "bibingka" and "suman". Ground rice was used in rice flour, coffee and tea. In addition, it was used as a major ingredient in traditional products (i.e. galapong, espasol, puto, and cutchinta), in processed seasonings (e.g. adobo, kaldereta, kare-kare mixes and rice mate) and used in meals for infants and cereal drinks. The pounded rice was used as "pinipig", "bibingkang pinipig", "suman", and "espasol".

The Market Structure, Conduct and Performance (SCP) of Inbred and Hybrid Rice Seeds Industry in Region III

JC Beltran, CC Launio, AB Mataia, DEV Salvahan

The study is conceptualized to assess the nature and performance of the country's inbred and hybrid rice seeds industry and identify some of the constraints of market participants which influence the industry's performance. The main questions the study would like to address are: How is the rice seed industry (inbred and hybrid) organized and coordinated? Is the rice seed business composed of many competing small participants or is it dominated by few large participants? What are the policies followed by key participants in buying, selling and pricing inbred and hybrid rice seeds? Are there any barriers to entry and exit, and if any, what are the major factors? What problems and constraints are observed in production, processing, transportation, storage, financial credit, marketing, and market information? How have the structure and conduct of the market and the constraints and problems affected the performance of the rice seeds market?

The study specifically aims to: (1) examine the organization and structure of the rice seed industry in terms of the number and distribution of key market participants, degree of their concentration, degree of product differentiation, magnitude of product differentiation, and barriers to entry and exit; (2) analyze the conduct of the rice seed industry in terms of pricing policy, marketing practices, and marketing and distribution costs; (3) assess the performance of the rice seed industry in terms of pricing efficiency and profitability; (4) determine the challenges/constraints facing the rice seed industry sector; and (5) identify policy recommendations based from the results. Knowledge on the impact of market structure and conduct on market performance provides a basis for evaluating public policy designed to promote competition in the rice seeds market.

The study covered a total sample of 182 inbred seed growers, 31 market outlets (i.e. seed centers/cooperatives/input dealers) and 210 quality seed users from five municipalities in each province in Region 3. A total of 171 inbred seed growers, 59 market outlets and 240 quality seed users were also interviewed from eight provinces outside Region 3. The expansion of the coverage area is primarily to make it easier to generalize the findings to the national level. The analysis involved the measurement of market concentration using the Four-Firm Concentration Ratio (CR4) and Herfindahl-Hirschman Index (HHI) methods. Descriptive statistics such as mean and frequency distribution were also employed in data analysis.

Highlights:

- Region 3 has the highest number of accredited seed growers in the Philippines with a total number of 1122. Among its provinces, Nueva Ecija accounted for more than 60% of their total population while Aurora has the least number with only 2% share (Figure 6). Majority of seed growers interviewed are producing inbred seeds. There are only few seed growers who are producing hybrid seeds in the region, and most of them are contracted by the private company.

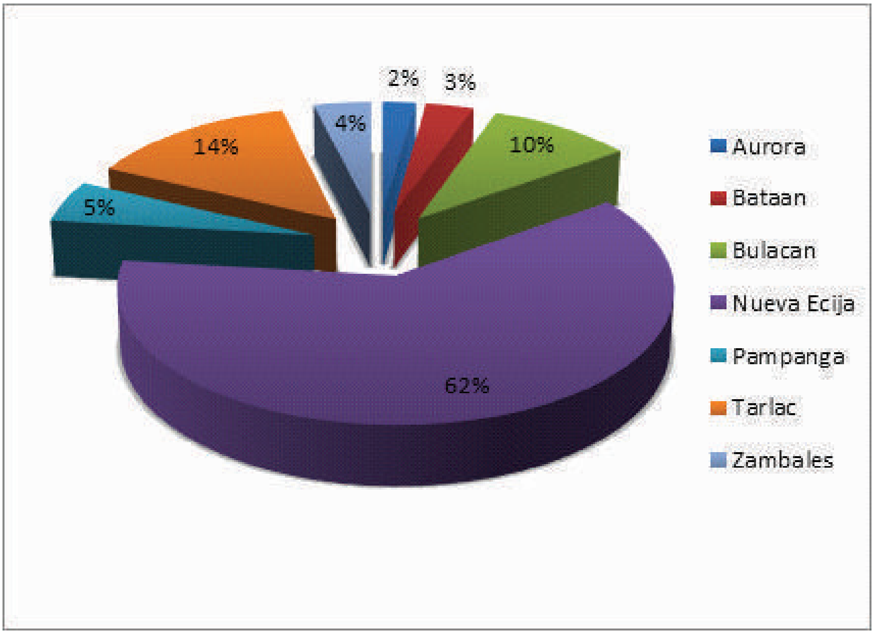


Figure 6. Distribution of number of rice seed growers (%) in Region 3.

- Table 9 shows the average seed production area across cropping seasons and provinces. In spite of the continues effort of the Philippine government to recruit seed growers to ensure enough supply of seeds, a 3-year trend shows that the average seed production area in Region 3 slightly declined with an average of two hectares (ha) for both dry (DS) and wet (WS) cropping seasons. This reduction, particularly in some provinces, was brought about by the declining volume of government procurement and the lack or the complete removal of seed subsidy that virtually affected the marketing of seeds. Some seed growers, therefore, reduced their area of seed production and convert it into commercial/ordinary rice farming. Nevertheless, seed growers from Nueva Ecija, Pampanga and Tarlac recorded an average seed production area of more than two ha for both seasons.

Table 9. Average seed production area (ha) in Region 3, DS 2010-WS2012

Province	Dry Season			Wet Season		
	2010	**2011**	**2012**	**2010**	**2011**	**2012**
Aurora	1.51	1.44	1.63	1.43	1.38	1.49
Bataan	1.98	2.00	2.09	1.75	1.91	1.73
Bulacan	1.99	2.07	1.98	2.01	1.94	1.79
Nueva Ecija	2.22	2.17	2.26	2.15	2.07	2.01
Pampanga	3.27	3.48	3.12	3.00	2.75	2.36
Tarlac	2.32	2.31	2.09	2.18	2.48	2.42
Zambales	1.60	1.56	1.69	1.60	1.70	2.15
Region III	2.20	2.17	2.16	2.08	2.08	2.04

- Trend shows that there were no significant changes in the average total clean seeds produced per ha of inbred seed growers in both dry and wet cropping seasons over the years (Table 10). The productivity of seed growers remained higher in dry season relative to wet season mainly due to a favorable weather condition during the former season. On average, the total clean seeds produced of seed growers was stable at around 4600 kilograms (kg)/ha and 4200 kg/ha for dry and wet cropping seasons, respectively.

- Based on the computed CR4 and HHI using the volume of certified seeds produced by the seed growers, result shows that the inbred rice seed industry was less concentrated, thus operating on a pure competition (CR4<0.5; HHI near zero). This means that the seed production of the four biggest seed growers in the region were not large enough to dominate the inbred rice seed industry. Similarly, there was equality in the market share among seed growers.

Table 10. Average clean seeds produced (kg/ha) in Region 3, DS2010 – WS2012

Province	Dry Season			Wet Season		
	2010	2011	2012	2010	2011	2012
Aurora	4369	4195	3723	4375	4016	4408
Bataan	5163	4860	4687	4368	4435	4045
Bulacan	4436	4551	4293	3998	3896	4087
Nueva Ecija	4984	4997	5111	4336	4429	4361
Pampanga	4829	5032	4874	4425	4117	4403
Tarlac	4125	3988	4198	3872	3981	4395
Zambales	4147	3978	3931	3878	3923	3748
Region III	4651	4614	4608	4173	4183	4249

- Currently, there are 175 known rice varieties. For the last three years (DS 2010 to WS 2012) there were 61 rice varieties planted by seed growers in Region 3 from which farmers are to choose. From this total, 32 varieties were planted in both seasons, 15 were only planted during dry season and 13 were just planted during wet season. On average, each seed grower planted three rice varieties in both dry and wet cropping seasons.

- From the list of reported rice varieties, NSIC Rc222, NSIC Rc216, PSB Rc18, NSIC Rc160, and PSB Rc10 were the top five popular varieties planted by the seed growers in the region in both dry and wet cropping seasons (Table 11). Note that two of the top three NSIC varieties (NSIC Rc216 and NSIC Rc160) were bred by the Philippine Rice Research Institute (PhilRice). These inbred rice varieties are highly demanded by the farmers because of their high yielding and good eating quality characteristics. For hybrid rice varieties, these are merely purchased by the farmers from the seed center and private companies since these are not commonly produced in the area.

Table 11. Top varieties planted by seed growers in Region 3, DS2010-WS2012

Season	Aurora	Bataan	Bulacan	Nueva Ecija	Pampanga	Tarlac	Zambales	Region III
DS	NSIC Rc216	NSIC Rc222	PSB Rc10	NSIC Rc222	PSB Rc10	NSIC Rc160	PSB Rc18	NSIC Rc222
	NSIC Rc128	NSIC Rc216	NSIC Rc216	NSIC Rc216	NSIC Rc216	PSB Rc18	NSIC Rc222	NSIC Rc216
	NSIC Rc152	PSB Rc18	PSB Rc18	PSB Rc82	NSIC Rc222	NSIC Rc216	NSIC Rc160	PSB Rc18
	NSIC Rc222	NSIC Rc130	PSB Rc82	PSB Rc18	PSB Rc18	NSIC Rc222	NSIC Rc216	NSIC Rc160
	PSB Rc14	NSIC Rc160	NSIC Rc222	NSIC Rc152	PSB Rc82	NSIC Rc152	PSB Rc14	PSB Rc10
	NSIC Rc138	NSIC Rc224	NSIC Rc224	NSIC Rc160	NSIC Rc122	NSIC Rc224	PSB Rc82	PSB Rc82
	NSIC Rc146	PSB Rc82	NSIC Rc214	PSB Rc10	NSIC Rc238	PSB Rc82	NSIC Rc128	NSIC Rc152
	NSIC Rc156	NSIC Rc122	NSIC Rc152	NSIC Rc224	NSIC Rc152	NSIC Rc214	NSIC Rc150	NSIC Rc224
	NSIC Rc160	NSIC Rc218	NSIC Rc160	NSIC Rc122	NSIC Rc160	NSIC Rc238	NSIC Rc122	NSIC Rc214
	NSIC Rc214	NSIC Rc214	NSIC Rc128	NSIC Rc130	NSIC Rc224	NSIC Rc150	NSIC Rc130	NSIC Rc122
	PSB Rc10			NSIC Rc214			NSIC Rc192	
	PSB Rc64			NSIC Rc238			NSIC Rc218	
	PSB Rc82						PSB Rc10	
WS	NSIC Rc222	NSIC Rc218	PSB Rc10	NSIC Rc222	PSB Rc10	NSIC Rc160	NSIC Rc222	NSIC Rc222
	NSIC Rc152	NSIC Rc130	NSIC Rc222	NSIC Rc216	NSIC Rc216	PSB Rc18	PSB Rc18	NSIC Rc216
	NSIC Rc216	NSIC Rc224	NSIC Rc216	NSIC Rc152	PSB Rc18	NSIC Rc216	NSIC Rc160	PSB Rc18
	PSB Rc18	PSB Rc18	PSB Rc82	PSB Rc10	NSIC Rc222	NSIC Rc222	PSB Rc82	NSIC Rc160
	NSIC Rc128	NSIC Rc222	PSB Rc18	PSB Rc18	PSB Rc82	NSIC Rc224	PSB Rc14	PSB Rc10
	NSIC Rc160	NSIC Rc128	NSIC Rc224	NSIC Rc238	NSIC Rc238	PSB Rc82	NSIC Rc216	PSB Rc82
	NSIC Rc146	NSIC Rc216	NSIC Rc238	NSIC Rc224	NSIC Rc214	NSIC Rc214	PSB Rc42	NSIC Rc224
	NSIC Rc154	NSIC Rc160	NSIC Rc160	PSB Rc82	NSIC Rc122	NSIC Rc238	NSIC Rc128	NSIC Rc152
	NSIC Rc224	NSIC Rc238	NSIC Rc214	NSIC Rc160	NSIC Rc152	NSIC Rc152	NSIC Rc150	NSIC Rc238
	NSIC Rc238	PSB Rc82	PSB Rc42	NSIC Rc130	NSIC Rc224	NSIC Rc150	NSIC Rc224	NSIC Rc214

- In marketing of rice seeds, most of the seed growers placed their produced in their common outlet such as seed center, cooperatives and input dealers. Among the provinces in Region 3, Nueva Ecija recorded the highest number of seed centers while none has been found in Zambales. Farmers directly buy their seeds from the seed growers in Zambales. The non-existence of any marketing outlet in the area signals the difficulty of marketing seeds for the producers while inaccessibility of quality seeds for the farmers. With few numbers of seed growers coupled with the absence of seed centers in Zambales, farmers complained about the lack and inaccessibility of quality seeds in the area. This is one of the areas that can be looked at to improve the use of quality seeds in the region.

- Problems in the production and marketing of seeds that are commonly reported by the seed growers, market outlet such as seed centers and commercial farmers in Region 3 include the seed/variety mixture, low germination rate, no proper tag, poor packaging, availability and inaccessibility of seeds.

IV. Special Studies

Analysis and Mapping of Impacts Under Climate Change for Adaptation and Food Security Step 1: Assessment of Climate Change Impacts on Crop Yields
FH Bordey, WB Collado

This study aims to provide relevant information on potential impacts of climate change on rice and corn yield. Using the CNCM3 global circulation model, historical data were reanalyzed and used to project climate variables from 2011-2050 under A2 and A1B scenarios. A2 scenario represents the negative extremes such as high population growth, slow economic development, and slow technological change. A1B assumes a scenario of rapid economic growth, a global population that peaks in mid-century, and rapid introduction of new and more efficient technologies. The reanalyzed and projected climate data are then used as inputs in the WABAL module – the crop model component of FAO – Modeling System for Agricultural Impacts of Climate Change. This produces agronomic relevant variables that can be used as explanatory variables for yield.

Highlights:

Data on yield of irrigated rice crop for January-June and July-December harvests as well as rainfed rice and corn yield for the latter period were obtained from the Bureau of Agricultural Statistics. The reanalyzed and projected climate variables from the Philippine Atmospheric Geophysical Astronomical Services

Administration were used as inputs in WABAL. Data on crop coefficients were gathered from literature. Peak sowing map from the International Rice Research Institute was also used to determine the starting dekad of the planting season. Some experiments for Nueva Ecija was done in the WABAL and the resulting agronomic relevant variables were used in statistical estimation of yield.

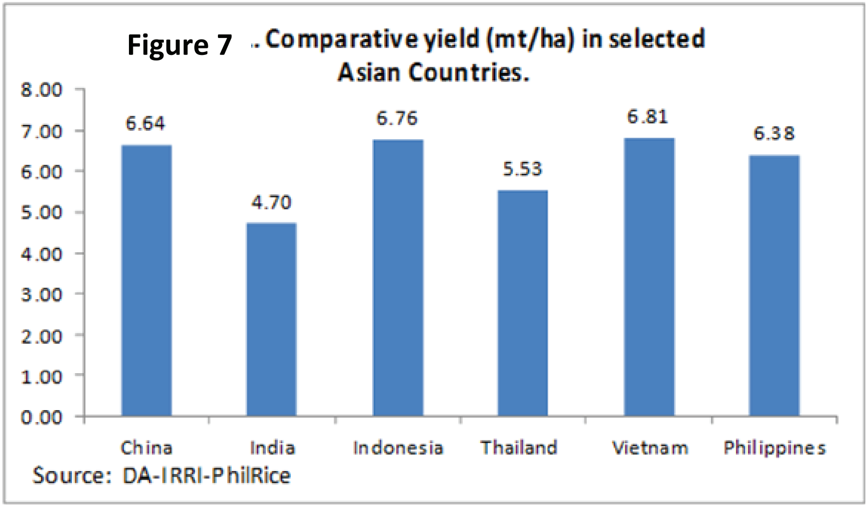
Benchmarking Philippine Rice Economy Relative to Major Rice Producing Countries in Asia

FH Bordey, PF Moya, JC Beltran, CC Launio, AC Litonjua, RG Manalili, AB Mataia, RB Malasa, SJC Paran, GO Redondo, RZ Relado, IR Tanzo, CG Yusongco

The objective of this study is to compare the cost of producing rice in irrigated and intensively cultivated areas in six countries in Asia including the Philippines. The selected sites are Nueva Ecija, Philippines; Zhejiang, China; Tamil Nadu, India; West Java, Indonesia; SuphanBuri, Thailand; and Can Tho, Vietnam. The preliminary results for the January-June harvest 2013 are reported.

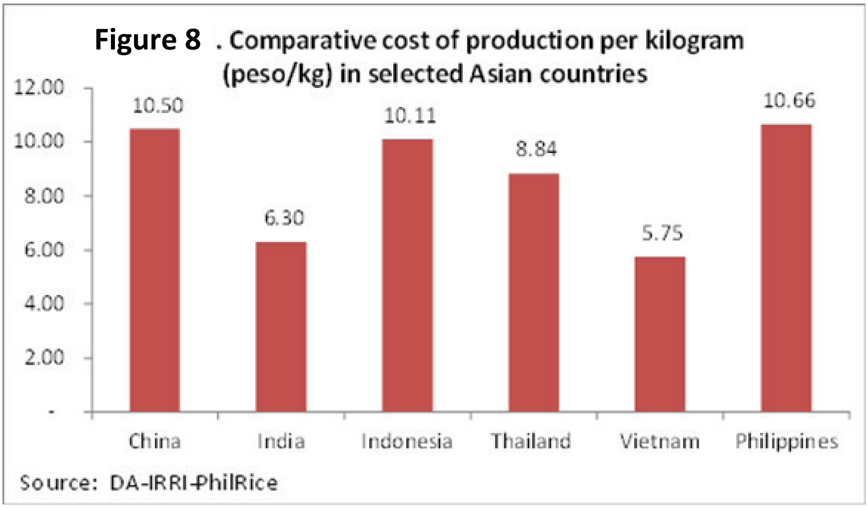
Highlights:

The Philippines ranked 4th in terms of production per hectare (or yield) at 6.38 mt/ha. Vietnam ranked 1st (6.81 mt/ha) followed by Indonesia (6.76 mt/ha). On the other hand, India has the least land productivity at 4.70 mt/ha (Figure 7).



Except for Vietnam which has three rice cropping seasons in a year, the rest of the countries have double crop.

Cash, non-cash, and imputed costs composed the total cost of production per hectare, which was divided by yield to get unit cost. The Philippines has the highest production cost per kilogram of paddy at PhP 10.66/kg followed by China (PhP 10.50/kg) and Indonesia (PhP 10.11/kg). Indonesia is a rice-importing country like the Philippines while China's rice net export has significantly declined from 2007 to 2011. The major rice exporters - Thailand, India and Vietnam - have lower cost of paddy production at PhP 8.84/kg, PhP 6.30/kg and PhP 5.75/kg respectively (Figure 8).



In the Philippines, labor is the largest cost item with a share of 48% to the total cost. Labor cost in the Philippines is more than double to that of the major rice-exporting countries - Vietnam, Thailand, and India (Table 12). The wide use of combine harvester-thresher enables these countries' harvesting, threshing and hauling to be done and paid as a single activity unlike in the Philippines were these are paid as separate activities. Crop establishment through transplanting method is another labor-intensive activity in the Philippines that adds to the labor cost. In Thailand and Vietnam, direct seeding through use of a mechanized sprayer reduces crop establishment cost.

Fertilizer expenditure composed 14% of the total production cost in the Philippines. Next to Vietnam, the Philippines had the 2nd highest expenditure in fertilizer. Lower fertilizer costs in China and Indonesia despite higher nitrogen fertilizer applications than in the Philippines (Table 2) signified lesser price of nitrogen fertilizer in these two countries. Similarly, the lower fertilizer cost in India despite comparable nitrogen fertilizer application to the Philippines also implies cheaper fertilizer in India. Government subsidy explains the lower price of fertilizer in India and Indonesia while it is unclear that China provides the same support. On the other hand, initial data on costs and fertilizer use suggest the same or higher fertilizer prices in Thailand and Vietnam than in the Philippines.

Machine rent is also fairly high in the Philippines, 2nd to India. It comprised 11% of the production cost. Machines that are commonly rented in the Philippines are two-wheel tractors for land preparation and thresher for threshing paddy. Few possible reasons for high rental cost are the expensive cost of machine acquisition, and the high cost of fuel and oil which are integrated in the rental rate.

Interest on capital explains 5% of the production cost in the Philippines. The higher share of interest to total cost than other material inputs such as seed (4%) and chemicals (2%) signify its importance. Greater access of farmers to formal financial sector in other countries could explain the lower interest rate faced by foreign farmers compared to Filipino farmers.

Although irrigation fee only accounts for 3% of production cost in the Philippines, only the Filipino farmers pay for the use of irrigation water from state-operated canals. Except in Indonesia where farmers pay a minimal amount for the person who opens and closes gate valves of state-owned canals, other countries support their rice farmers through free use of irrigation water.

Table 12. Cost of paddy production in selected Asian countries, 2013.

Items	Zhejiang China (n=25)	Tamil Nadu India (n=50)	West Java Indonesia (n=25)	Suphan Buri Thailand (n=24)	Can Tho Vietnam (n=100)	Nueva Ecija Philippines (n=49)
Production Cost (Peso/ha)						
Seed	3,749	2,172	890	6,085	2,938	3,000
Fertilizer	6,421	4,081	6,582	8,828	10,785	9,291
Chemicals	2,642	968	7,971	5,630	6,277	1,696
Labor	52,944	12,896	43,085	8,929	11,224	32,927
Machine	3,487	8,214	1,601	5,577	5,800	7,723
Irrigation Fee	-	-	38	-	-	2,215
Interest on Capital	-	596	898	342	626	3,128
Others	450	706	7,345	13,454	1,465	8,032
Total	**69,694**	**29,633**	**68,410**	**48,846**	**39,115**	**68,011**

Source: DA-IRRI-PhilRice. Benchmarking Philippine Rice Industry Relative to Major Rice Producing Countries in Asia.
Note: Preliminary results based on edited survey returns of first season survey in 2013. For discussion only.
DO NOT QUOTE.

Table 13. Input use for paddy production in selected Asian countries, 2013.

Items	Zhejiang China (n=25)	Tamil Nadu India (n=50)	West Java Indonesia (n=25)	Suphan Buri Thailand (n=24)	Can Tho Vietnam (n=100)	Nueva Ecija Philippines (n=49)
Seeds (kg/ha)	114	84	16	213	223	72
Fertilizer (kg/ha)						
Nitrogen	152	105	156	87	99	108
Phosphorus	47	51	95	47	71	38
Potassium	87	41	44	12	42	29
Total Labor (person-days/ha)	37	98	135	16	35	89
Land Preparation	5	5	20	2	2	8
Crop Establishment	2	34	28	1	5	19
Crop care and maintenance	23	57	52	13	23	39
Harvesting and threshing	1	2	27	1	2	20
Postharvest	6	1	8	-	3	3

Source: DA-IRRI-PhilRice. Benchmarking Philippine Rice Industry Relative to Major Rice Producing Countries in Asia.
Note: Preliminary results based on edited survey returns of first season survey in 2013. For discussion only.
DO NOT QUOTE.

Improving the Agricultural Insurance Program to Enhance Resilience to Climate Change

FH Bordey, MG Lapurga

This study aims to analyze how the adoption of good agricultural practices in rice farming can compliment the enhancement of agricultural insurance in the Philippines. Using a rider questionnaire to the Rice-Based Farm Household Survey, adoption of crop insurance and pest management practices on rice farming were determined in Nueva Ecija, Iloilo, and Leyte with 354 respondents.

Highlights:

Only 37 out of 354 respondents availed of crop insurance at least once between 2007 and 2011. About 60% of farmers who have their crops insured enrolled in traditional type of insurance while 27% availed of the weather index based insurance. These farmers learned about crop insurance from: bank (35%); Philippine Crop Insurance Corporation and Alalay Sa Kaunlaran Inc. (16% each); and farmers' cooperative (14%). Accessing credit is the primary reason for enrolling in crop insurance.

Sixty-seven percent of the farmers who did not avail of crop insurance from 2007-2011 stated that they would not want to insure their crops in the future. The major reasons given for not enrolling are: (1) limited understanding of insurance; (2) lack of funds; and (3) added cost.

Respondents identified pests and diseases as the top hazard that reduces their rice yield. This is followed by strong winds and typhoons, drought, and flood, which are all related to climate. To manage the risks associated with these hazards, farmer often use the strategies of using recommended technologies and working together with other farmers. Strategies such as use of own funds as capital, borrowing funds, and reducing input use are sometimes used by respondents. Meanwhile, engaging in other agricultural livelihood, crop diversification, use of crop insurance, and selling or pawning properties are the least used strategies to cope with yield reducing hazards.

Palayabangan: Cost and Returns

RZ Relado, AB Mataia, RC Guillen, RB Malasa, and EJP Quilang

The Philippine Rice Research Institute (PhilRice) recognizes that it does not have a monopoly on knowledge and technology about rice production to improve farmer productivity and livelihood. Farmers, academic institutions, agricultural corporations, other government research agencies, and other rice-producing stakeholders have also developed their own knowledge and technologies which they claim are up to par (or even better) with that of the Institute (in terms of cost-effectiveness and yield). Thus, to expedite sharing and validating of these rice production knowledge and technologies the Institute organized a contest entitled, "Palayabangan: The 10-5 Challenge." This also works within the participatory development approach in generating technology. Moreover, location-specificity of technologies could also be addressed since the contest will be implemented in all PhilRice stations. Other rice-production stakeholders and PhilRice researchers were encouraged to join and showcase their technologies on how they can attain 10 tons per hectare (t/ha) at PhP 5.00 per kilogram (/kg). The cost of production and yield for 2013 wet season (WS) were monitored for each participant. Cost and Return Monitor/s were identified and trained in each station on what types of cost data are to be gathered. A daily monitoring form (electronic and hard copy) was developed and assigned for each participant. At the end of 2013WS, the costs were tabulated and yields were computed based on 14% moisture content to assess the productivity of each participant.

Highlights:

- PhilRice Isabela and PhilRice-CES had the most diverse participants with 11 and 10 entries, respectively. On the other hand, PhilRice-Midsayap only had PhilRice entries because of the peace and order situation in the area which discouraged participation from individual farmers, cooperatives, or agricultural corporations.

- Initial results show that Mr. Sevilleja, a participant in PhilRice-Isabela, was the only participant to meet the criteria of producing a kilogram of rice for PhP5.00. Unfortunately, he was not able to attain 10 t/ha but his yield is also high at 7.49 t/ha. Two other participants that compose the top five lowest cost per kilogram also came from PhilRice-Isabela at PhP 6.11/kg (Dynapharm) and PhP 6.37/kg (PhilRice entry). PhilRice entries in Agusan (PhP 6.43/kg) and Negros (PhP 6.59/kg) complete the list of the participants with the least cost per kilogram of rice produced.

- The top five participants with the highest cost per kilogram across all stations are Mr. Alonzo in PhilRice-CES (PhP 31.83/kg), Mr. Tancioco in PhilRice-LB (25.94/kg), a PhilRice entry in Negros (PhP 24.20), Growell in PhilRice-LB (PhP 20.14/kg) and Central Bicol State University of Agriculture (CBSUA) in PhilRice-Bicol (PhP 19.04/kg).

- Comparing the yield levels across all the stations, one PhilRice researcher entry in PhilRice-Batac attained the highest yield 7.97 t/ha but the cost per kilogram was at PhP 9.44/kg. This was followed by three entries in Isabela with yield levels at 7.56 t/ha, 7.49 t/ha, and 7.16 t/ha by Mr. Joson, Mr. Sevilleja, and Dynapharm, respectively. The fifth highest yield again came from a PhilRice entry in Batac at 7.05 t/ha. None of the participants was able to reach 10 t/ha nor break 8.0 t/ha.

- The lowest yields was in by a PhilRice entry in Negros station at 1.90 t/ha followed by Mr. Tancioco at PhilRice LB at 1.99 t/ha. Mr. Alonzo in PhilRice-CES (2.03 t/ha), SL AgriTech in

PhilRice-Negros (2.33 t/ha), CBSUA in PhilRice-Bicol (2.58 t/ha) completed the list of the top five lowest yielders. Except for SL AgriTech in PhilRice-Negros all participants with the lowest yields were also the ones with the highest cost per kilogram.

Table 14. Cost per kilogram by station, 2013 WS (PhP/kg).

Station	Participant	Cost per kilogram (PhP/kg)
Top five low yielders		
Negros	PhilRice VI	6.59
Agusan	PhilRice (PLOT9 BDO)	6.43
Isabela	PhilRice	6.37
Isabela	Dynaphram	6.11
Isabela	Mr. Sevilleja	5.00
Top five high yielders		
CES	Mr. Alonzo	31.83
LB	Mr. Tancioco	25.94
Negros	PhilRice X	24.20
LB	Growell	20.14
Bicol	CBSUA	19.04

Table 15. Yield level by station, 2013 WS (t/ha).

Station	Participant	Yield (t/ha)
Top five high yielders		
Batac	PhilRice I	7.96
Isabela	Mr. Joson	7.56
Isabela	Mr. Sevilleja	7.49
Isabela	Dynapharm	7.16
Batac	PhilRice	7.05
Top five low yielders		
Bicol	CBSUA	2.58
Negros	SL Agritech	2.33
CES	Mr. Alonzo	2.03
LB	Mr. Tancioco	1.99
Negros	PhilRice X	1.90

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

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

We accomplish this mission through research and development work in our central and seven branch stations, coordinating with a network that comprises 57 agencies and 70 seed centers strategically located nationwide.

To help farmers achieve holistic development, we will pursue the following goals in 2010-2020: attaining and sustaining rice self-suffiency; reducing poverty and malnutrition; and achieving competitiveness through agricultural science and technology.

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

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