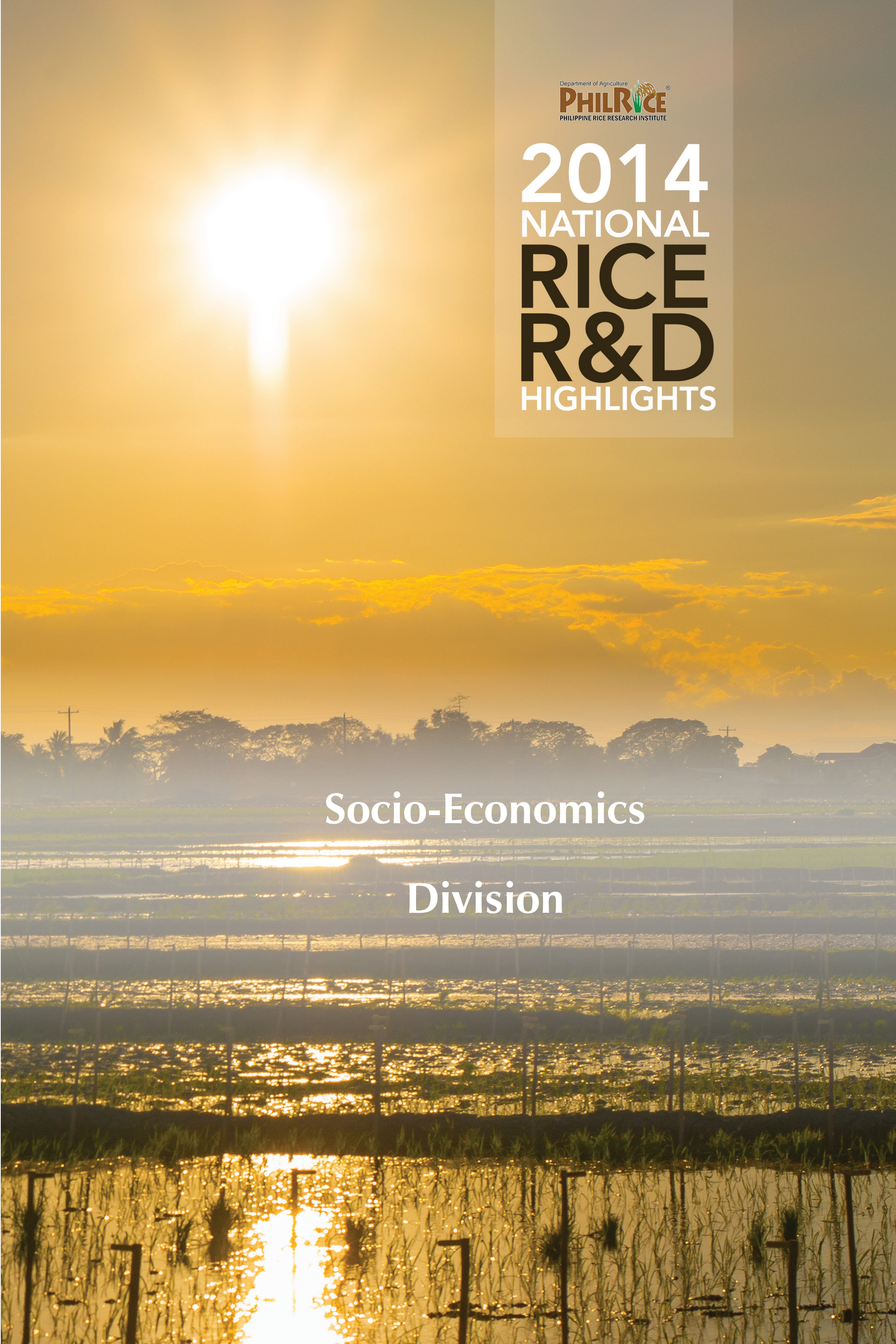

Department of Agriculture
PHILRICE
PHILIPPINE RICE RESEARCH INSTITUTE

2014 NATIONAL RICE R&D HIGHLIGHTS

Socio-Economics Division

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SOCIOECONOMICS DIVISION

Division Head: RZ Relado

Executive Summary

The Socioeconomics Division 1) conducts discipline-based studies, 2) supports PhilRice's function of providing timely information to rice stakeholders, 3) develops and tests socioeconomic methodologies and theories, 4) conducts impact assessments of rice technologies, and 5) implements policy research and advocacy activities of the Institute. The division has 3 core projects for 2014 with 9 studies. In addition, SED does various projects and studies that are both internally- and externally-funded.

I. Statistical Series on the Rice Economy

Project Leader: RZ Relado

The project addresses the need to gather, process, and update rice statistics and make available the information to primary rice stakeholders. Three studies are under the project. These are 1) monitoring of the rice-based farm households in major rice producing provinces in the Philippines, 2) revisiting the rice-based socioeconomic information system, and 3) updating rice and rice-related statistics. The first study is concerned with primary data gathering that would form the sequence of the quinquennial survey of the Socioeconomic Division. The second study is on producing socioeconomic profiles that would be comprehensible to target stakeholders and is available as web-based applications. The last study is on continued updating of rice statistics from available secondary data in handbook and web format.

Regular Monitoring of Rice-Based Farm Households in Major Rice-Producing Provinces in the Philippines

RZ Relado, JC Beltran, FH Bordey, CC Launio, AC Litonjua, RB Malasa, RG Manalili, AB Mataia, GO Redondo (+), IR Tanzo, IA Arida, GC Lapurga, RF Ibarra, JS Paraguison, SJC Paran,CN Parayno, DEC Salvahan, JY Siddayao, RF Tabalno, and CG Yusongco

Yield and production costs of rice farming are two important factors that significantly contribute to the net profit of rice farmers in the Philippines. Increasing the yield means adopting technologies that could optimize production efficiency. On the other hand, lowering the cost of production entails using cost-saving technologies. Hence, rice R&D aims to produce and promote yield-enhancing and cost-saving technologies. In this study, rice farm yields and production costs are documented. For the 2011 wet season

(WS), yield levels and production costs are processed and analyzed from the Rice-Based Farm Household Survey (RBFHS). The data covered information gathered from July to December 2011 rice cropping season, which involves 2,399 sample farmers from 33 major rice producing provinces in the country.

Highlights:

- In 2011 WS, farmers harvested an average of 3.7 tons of palay per hectare with PhP11.49 production cost per kilogram. With this yield and production cost information, rice R&D should continue to develop ways that could increase yield and lower production costs. (Table 1).

- Hired labor and power costs constitute the largest portion (33%) of the total production cost in rice farming. These account for payments for hired laborers and machine used. (Figure 1).

- Next to the cost for hired labor and machine use are land rent (24%), fertilizer (14%), and seeds (5%). Imputed cost for operator, family and exchange labor comprises 8% of the total production cost. (Figure 1).

- The average net return from rice farming is 15% of the total production cost per hectare. (Table1).

- Yield is significantly higher for farmers who used hybrid or registered seeds compared to those who used certified, good, and farmer's seeds. (Figure 2).

- Fertilizer application depends on the nutrient requirement of the soil and capacity of farmers to buy inputs. It is observed that higher yield is achieved with higher nitrogen application. Likewise, higher P2O5 application results to higher yield. However, applying more than 40kg of K2O per hectare does not lead to significantly higher yield compared with applying only 20 to 40kg of K2O per hectare.

  (Figure II). A significantly higher yield is observed for farmers who applied herbicide, fungicide, and other pesticides [except for insecticide]. (Figure II).

- Transplanted rice has significantly higher yield than direct-seeded rice.

- Yield is significantly higher for irrigated farms than farms that depend on rain as the only water source. (Figure II).

- Yield is significantly higher for farmers who attended seminars or trainings related to rice farming from 2009 to 2011. (Figure II).

- It is interesting to note that achieving 10 tons/ha at P5/kg production cost is feasible but with only 2 out of 2399 farmers achieved it during 2011 WS.

Table 1. Costs and Returns of Rice Production, By Ecosystem, Philippines, July-December 2011

ITEMS	All ecosystem (n=2399)*				Irrigated (n=1847)				Rainfed (n=552)			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Area planted (ha)	1.06	0.92	0.02	15.00	1.10	0.88	0.02	6.00	0.94	1.01	0.05	15.00
RETURNS												
Yield (kg/ha)	3,673	1,545	56	15,400	3,884	1,499	140	15,400	2,967	1,486	56	11,000
Price (Php per kg)	13.23	1.82	8.00	18.00	13.26	1.85	8.00	18.00	13.11	1.68	8.00	18.00
Gross Returns	**48,582**				**51,509**				**38,895**			
COSTS (Php/ha)												
Material costs												
Seeds	2,140	1,151	180	6,600	2,196	1,187	180	6,600	1,952	998	390	6,000
Fertilizer	5,735	3,320	0	17,667	6,201	3,307	0	17,667	4,175	2,861	0	17,333
Herbicides	595	635	0	3,700	589	623	0	3,667	616	674	0	3,700
Insecticides	897	836	0	4,219	908	845	0	4,219	861	805	0	4,093
Fungicides	110	353	0	3,333	123	377	0	3,333	69	255	0	2,500
Other pesticides	329	470	0	2,463	354	483	0	2,463	247	415	0	2,333
Total Material Costs	**9,808**				**10,372**				**7,921**			
Labor and Power Costs												
Hired Labor												
Pre Harvest Labor	5,242	3,459	0	21,612	5,474	3,475	0	21,612	4,467	3,291	0	16,510
Harvesting and Threshing	7,250	3,646	0	18,349	7,631	3,617	0	18,349	5,977	3,453	0	18,000
Post Harvest Labor	389	444	0	2,195	404	457	0	2,195	340	395	0	1,940
Permanent labor	1,044	3,071	0	40,000	1,198	3,307	0	40,000	529	2,013	0	17,056
OFE Labor												
Pre Harvest Labor	3,132	2,715	0	18,207	3,239	2,811	0	18,207	2,775	2,331	0	14,770
Harvesting and Threshing	96	331	0	3,000	78	294	0	2,703	153	426	0	3,000
Post Harvest Labor	127	213	0	1,500	125	214	0	1,500	133	209	0	1,379
Total Labor Cost	**17,281**				**18,149**				**14,374**			
Other costs												
Food	1,123	1,063	0	5,385	1,117	1,053	0	5,385	1,141	1,098	0	5,100
Power	622	879	0	4,187	636	884	0	4,187	575	861	0	4,100
Irrigation and Drainage	946	1,086	0	5,625	1,220	1,089	0	5,625	31	275	0	3,947
Transportation	270	318	0	1,772	272	324	0	1,772	264	299	0	1,600
Land tax	377	555	0	2,625	397	570	0	2,625	309	496	0	2,621
Land rent	10,351	5,441	150	28,704	10,833	5,526	150	28,704	8,738	4,810	825	28,669
Other inputs	723	942	0	6,943	768	985	0	6,943	572	763	0	6,391
Interest on capital	702	1,147	0	5,856	763	1,185	0	5,856	496	985	0	5,768
Total Other Costs	**15,113**				**16,005**				**12,126**			
Total Cost of Production	**42,201**				**44,526**				**34,421**			
NET RETURNS	**6,381**				**6,983**				**4,474**			
Cost/kg	**11.49**				**11.47**				**11.60**			
Net Profit Cost Ratio	**0.15**				**0.16**				**0.13**			
Net profit from Rice Farming	6,381				6,983				4,474			
Net Profit from Rice Farming + Returns to Own Labor	9,735				10,425				7,535			
Net Profit from Rice Farming + Returns to Own Labor and Land	20,086				21,258				16,273			
Net Profit from Rice Farming + Returns to Own Labor, Land, and Capital	20,788				22,021				16,769			

* Excludes farmers who temporarily stopped farming (n=54), experienced crop failure (n=38) and with inconsistent data (n=9)

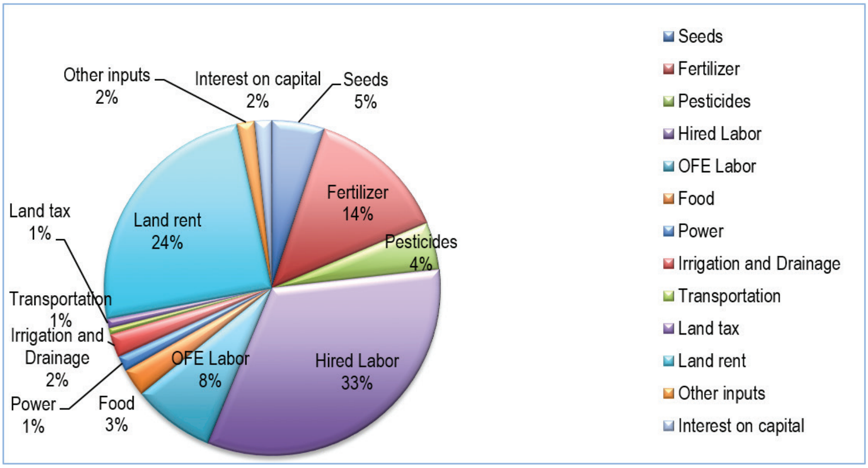

Figure 1. Distribution of the total production cost of rice farming, July-December 2011, Philippines

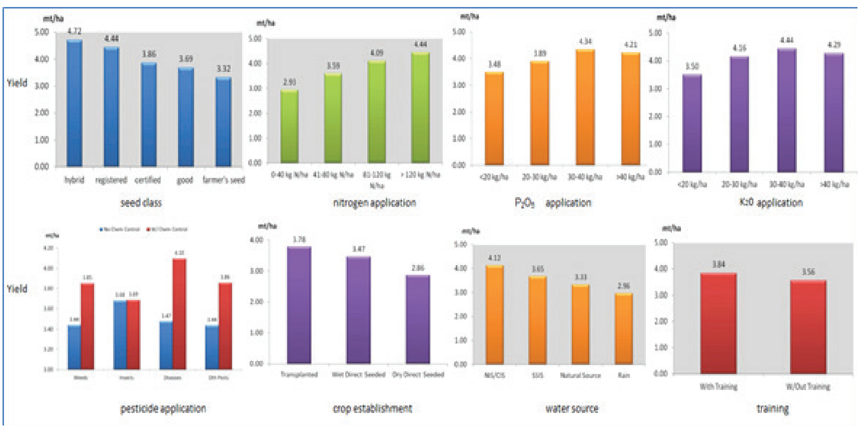

Figure 2. Variation on Rice Yield Based on Inputs, Water Source and Training, July-December 2011

Revisiting the Rice-Based Socioeconomic Information System
RB Malasa, RM Almario, RF Ibarra, RF Tabalno, AC Arocena, FH Bordey, and AB Mataia

There is a demand on rice-based socioeconomic information thus it is necessary to bring together general information about rice in the Philippines. To address the issue of data shortage, the Socioeconomics Division (SED) of the Philippine Rice Research Institute (PhilRice) conducted quinquennial surveys to collect information about the technology, social and economic status of rice-based farming households in 30 major rice-producing provinces around the Philippines known as the Rice-Based Farm Household Surveys (RBFHS). Nevertheless, the circulation of information from these surveys was limited within the Institute. Only in rare instances when PhilRice was asked to comment about the technological and socioeconomic status of rice farmers that these information were brought to public use. Thus, it is important to organize these databases to make it accessible, available, and user-friendly for potential users. Thus, the Rice-Based Socioeconomic Information System was conceptualized to construct a process/system for local retrieval of RBFHS datasets and develop a web-based system on selected RBFHS data items for access and processing.

Highlights:

- Updating of the 1996 to 1997 RBFHS geocodes in 33 provinces based on latest Philippine Standard Geographic Code of Philippine Statistical Authority – National Statistical Coordination Board.

- Encoding of farmer names in 1996-1997 RBFHS in 33 provinces.

- Drafting the database structure for data capture, storage and retrieval.

- Prepared initial web-based database system and selected user interface design particularly on socioeconomic information, cost and returns, and input-output.

- Reviewed and verified consistency of pesticide matrix with raw data of 1996 to 1997 and 2001to 2002 data sets.

- Reviewed and verified consistency of selected 1996 WS to 2007 DS labor data sets relative to the 2011 data sets.

- Accomplished 29 matrices and output tables from 1996 WS to 2007 DS labor data sets (Table 2 and Figures 1 and 2).

Table 2. List of Tables and Matrices Accomplished

List of Tables and Matrices
Table 1: Socioeconomic characteristics of farmer respondents
Table 6: Estimated annual per capita income and percentage distribution of income, by source
Table 8: Farm size, number of rice parcels and farm location, by ecosystem
Table 9: Percentage distribution of tenurial status, by ecosystem
Table 10: Acessibility of rice parcel to wholesome markets
Table 11: Percentage distribution of farm households, by source of water irrigation
Table 14: Cropping pattern of farm households, by ecosystem (1996-2002 only)
Table 15: Method of crop establishment of farm household used, by ecosystem
Table 17: Method of crop seedbed preparation used
Table 19: Top five (5) farmer's preferred variety seeds, by ecosystem
Table 20: Reasons why farmers used the seed variety, by ecosystem and by cropping
Table 21: Classification of seed used
Table 22: Sources of seed used
Table 23: Input and output by ecosystem and cropping season
Table 25: Types of fertilizer applied by farmers, by ecosystem
Table 27: Fertilizer application: Number of times applied by ecosystem
Table 28: Types of herbicides and weedicides applied by farmers, by ecosystem and cropping season
Table 31: Types of pesticides/insecticides/fungicides/molluscicides/rodenticides, by ecosystem and cropping season
Table 33a: Insecticide application: Number of times applied by ecosystem
Table 33b: Fungicide application: Number of times applied by ecosystem
Table 33c: Mollusicide application: Number of times applied by ecosystem
Table 33d: Rodenticide application: Number of times applied by ecosystem
Table 33e: Other chemical application: Number of times applied by ecosystem
Table 38: Average production and disposition of harvest (sack per hectare) by ecosystem
Table 39a: Percent of farmers with harvest allotted for sale, by ecosystem
Table 39b: Distribution of farmers by marketing practices and ecosystem
Table 41: Source of capital of farm financing, by ecosystem
Table 39b: Information on borrowed capital, by ecosystem

SOCIOECONOMICS AND TECHNOLOGY PROFILE
Socioeconomic characteristics of farmer respondents

PHILIPPINES	JUL-DEC 1996 HARVEST		JUL-DEC 2001 HARVEST		JUL-DEC 2006 HARVEST	
ITEMS	IRRIGATED	NON-IRRIGATED	IRRIGATED	NON-IRRIGATED	IRRIGATED	NON-IRRIGATED
Mean Age	47.68	47.25	50.37	50.4	53.35	52.86
Gender (%)						
Male	91	93	91	93	88	92
Female	9	7	9	6	12	8
Civil Status (%)						
Single	3	3	4	3	4	3
Married	90	91	87	90	85	89
Widow/Widower	7	6	9	7	10	7
Separated	0	1	0	0	0	1
Years of Schooling (yrs)	7.43	6.63	7.49	6.87	7.71	6.93
Farming Experience (yrs)	21.03	20.83	23.83	24.07	24.78	25.52
Household Size (no)	5.61	5.64	5.5	5.45	5.15	5.49
Male	2.84	2.95	2.76	2.76	2.65	2.83
Female	2.77	2.69	2.74	2.69	2.49	2.65
Source of Income (%)						
Rice Farming	85	72	82	71	78	68
Other Faming/Fishing	9	14	11	16	22	32
Non-Farming	6	15	6	13	0	0
Attendance in Trainings/Seminars (%)						
Attended	53	35	55	42	42	31
Not-Attended	46	64	45	58	58	69
Membership in Farmer Organizations (%)						
Male	56	34	50	36	52	35
Female	44	66	50	64	48	64

Notes:
- During the survey for the Jul-Dec 1996 harvest, 2,500 respondents were surveyed.
- During the survey for the Jul-Dec 2001 harvest, 2,585 respondents were surveyed.
- During the survey for the Jul-Dec 2006 harvest, 1,999 respondents were surveyed.

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Figure 3. Sample of socioeconomic profile generated by RBSEIS.

SOCIOECONOMICS AND TECHNOLOGY PROFILE
Input and output by ecosystem

PHILIPPINES	JUL-DEC 1996 HARVEST											
Items	ALL ECOSYSTEM				IRRIGATED				NON-IRRIGATED			
	n = (2,030)				n = (1,327)				n = (703)			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Area planted (ha)	**1.28**	**1.41**	**0.05**	**21**	**1.44**	**1.6**	**0.05**	**21**	**0.98**	**0.88**	**0.05**	**7**
Yield (kg/ha)	3,225	1,357	90	9,984	3,500	1,307	160	9,984	2,705	1,295	90	9,200
Material Inputs												
Seed (kg/ha)	124.88	64.89	6.67	1226.67	125.38	60.47	6.67	769.23	123.94	72.48	10	1226.67
Fertilizer (kg/ha)												
N	64.81	47.64	0	382.95	70.49	47.3	0	382.95	54.07	46.4	0	316.28
P	6.99	8.29	0	94.39	7.7	8.75	0	94.39	5.65	7.15	0	44.57
K	9.57	14.15	0	158.81	10.73	14.68	0	158.81	7.38	12.81	0	112.47
Herbicide (kg A.I./ha)	0.52	3.45	0	115.38	0.6	4.18	0	115.38	0.36	1.13	0	20
Insecticide (kg A.I./ha)	0.2	0.98	0	24.05	0.24	1.16	0	24.05	0.13	0.42	0	6.55
Fungicide (kg A.I./ha)	0.03	0.58	0	23.33	0.02	0.32	0	10.85	0.04	0.88	0	23.33
Other chemicals (kg A.I./ha)	0.1	0.89	0	33.96	0.13	1.08	0	33.96	0.04	0.25	0	4
Labor Requirements (person-days/ha)												
Hired labor												
Pre Harvest Labor	24	34	0	704	25	38	0	704	21	25	0	233
Harvesting and Threshing	17	18	0	256	18	19	0	256	14	15	0	124
Post Harvest Labor	1	3	0	45	2	4	0	35	1	3	0	45
OFE labor												
Pre Harvest Labor	48	44	0	768	48	47	0	768	47	39	0	325
Harvesting and Threshing	3	10	0	128	2	7	0	128	6	14	0	95
Post Harvest Labor	6	7	0	96	5	7	0	96	6	7	0	50
Total Labor	**99**				**100**				**95**			

PHILIPPINES	JUL-DEC 2001 HARVEST											
Items	ALL ECOSYSTEM				IRRIGATED				NON-IRRIGATED			
	n = (2,330)				n = (1,534)				n = (796)			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Area planted (ha)	**1.13**	**1.19**	**0.06**	**25**	**1.22**	**1.28**	**0.06**	**25**	**0.91**	**0.96**	**0.1**	**19.25**
Yield (kg/ha)	3,209	1,258	48	8,625	3,484	1,173	54	7,828	2,675	1,229	48	7,333
Material Inputs												
Seed (kg/ha)	116.5	55.01	2	500	117.81	55.33	2	500	113.8	55.61	4	405
Fertilizer (kg/ha)												
N	73.65	50.96	0	520	80.43	50.94	0	520	57.08	46.3	0	315
P	6.97	8.26	0	109.25	7.57	8.66	0	109.25	5.34	7.01	0	46.32
K	9.43	14.39	0	345.83	10.43	15.59	0	345.83	6.86	11.12	0	106.24
Herbicide (kg A.I./ha)	0.37	1.43	0	37.5	0.36	1.19	0	37.5	0.38	1.93	0	30
Insecticide (kg A.I./ha)	0.18	0.76	0	20.03	0.21	0.85	0	20.03	0.13	0.65	0	15.63
Fungicide (kg A.I./ha)	0.03	0.24	0	7.57	0.02	0.2	0	5	0.03	0.31	0	7.57
Other chemicals (kg A.I./ha)	0.16	2.41	0	59.21	0.09	0.74	0	20	0.32	4.19	0	59.21
Labor Requirements (person-days/ha)												
Hired labor												
Pre Harvest Labor	18	18	0	213	19	18	0	213	17	18	0	188
Harvesting and Threshing	15	13	0	150	16	13	0	150	12	12	0	83
Post Harvest Labor	2	4	0	50	2	4	0	50	1	3	0	33
OFE labor												
Pre Harvest Labor	36	23	0	224	37	24	0	224	35	22	0	206
Harvesting and Threshing	1	5	0	40	1	4	0	37	2	6	0	40
Post Harvest Labor	4	5	0	42	4	5	0	40	5	5	0	42
Total Labor	**76**				**79**				**72**			

... - Data not available during season
Jul-Dec 1996 = 2,500 respondents
Jul-Dec 2001 = 2,585 respondents

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Figure 4. Sample of input-output data generated by RBSEIS.

Updating Rice and Rice-Related Statistics

GO Redondo (+), RF Tabalno, and RZ Relado

In collaboration with BAS, the study attempts to produce and publish an updated edition of the Rice Statistics Handbook. This should include data from 2003 and onwards in a format that researchers, planners, and policy makers will find useful. This study is crucial in supporting PhilRice's goal to attain and sustain rice self-sufficiency through maintaining a database to guide policy makers in making policy decisions. The study analyzes and consolidates rice and rice-related data and information to be used by development planners, RD&E researchers, and policy makers. Secondary data on rice production and other related data are gathered and consolidated. Data were then tabulated and disaggregated at the provincial level. Compilation, retrieval and organization of these data were done by BAS while validation, editing and retrieving of output tables were performed by SED staff.

Highlights:

- Three volumes of various rice statistical tables were updated until 2012.
- The first volume covers the following data: production, area harvested, yield, production distribution, utilization and disposition, exports and imports.
- The second volume documents rice production factors: irrigation, rainfall, physical area, seeds, fertilizers, pesticides, labor cost, cost and returns, prices, wages, and production losses.
- The third volume accounts for the following: rice prices, post-production information, and NFA procurements and injections.

II. Adoption and Impact Evaluation of Rice and R&D Products and Related Support Services

Project Leader: JCBeltran

The project aims to contribute in the effective and efficient monitoring, evaluation and quantification of the performance of rice R&D products and development programs through ex-ante, monitoring and evaluation activities, and ex-post impact evaluation studies. It hopes to provide evidence of the usefulness of R&D, and production related services, while providing feedbacks to researchers and development workers to ensure more efficient R&D work, research prioritization, and better management of projects and programs.

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

CC Launio, RG Manalili, RB Malasa, and GO Redondo (+)

This study aimed to (1) investigate the current use and management of private irrigation pumps, (2) examine the factors influencing private investments in irrigation pumps and tubewells, and (3) assess the farm-level impacts of using shallow tubewells (STW) and open surface pumps (OSP) in rice-based farming. The “with or without” evaluation framework was used, taking parcels with no sources of irrigation other than rain as the control group. A household survey was conducted from December 2012 to April 2013 in the top 10 provinces using irrigation pumps (based on the 2002 agricultural census and rice-based farm household survey)—Cagayan, Camarines Sur, Iloilo, Isabela, Nueva Ecija, Oriental Mindoro, Pampanga, Pangasinan and Tarlac. Six hundred pump-users and 150 purely rainfed farmers were interviewed using an interview schedule covering farm profile, cropping patterns, history and problems of using irrigation pumps, technical information on pumps, engines and tubewells, water management and input-output data for the production of rice and selected non-rice rice-based crops.

Highlights:

- Figure 1 shows that considering all therice-based parcels cultivated by farmers who are using pumps, almost 70% derive water through shallow tube wells (STW) defined as tubewells with a depth of less than 100 meters and which can support 3 to 5 hectares. The rest are open surface pumps which draw water from rivers or creeks (24%), canals of national or communal irrigation systems (6%), or from other man-made structures such as small water impounding projects (SWIP), small farm reservoir (SFR), and fishponds (1%). Some 15% use groundwater and surface irrigation sources conjunctively.

- Based on farmers' recall, irrigation pumps started to be used as early as the 1960s although most think they first appeared in their barangays during the 1980-1989 decade (Table 3). Majority of respondents claimed that their major reason for using pumps is to support dry season rice.

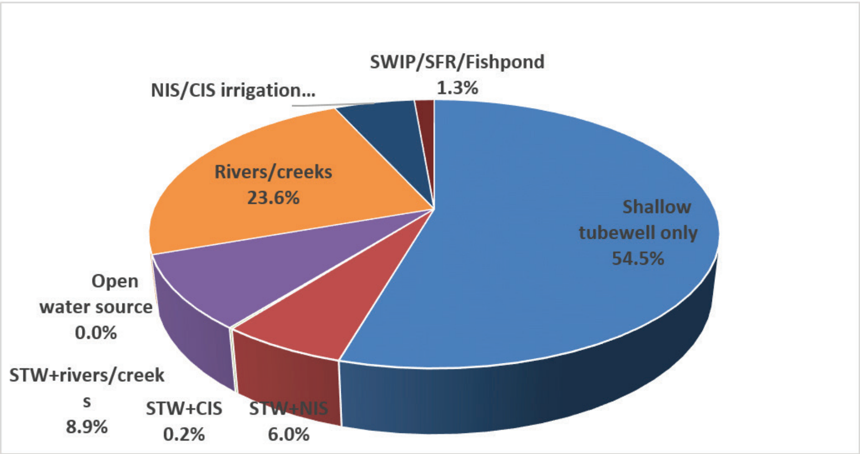

Figure 5. Sources of pumped irrigation water.

Table 3. Year first used irrigation pumps, and reason/s for using STW/OSP

Items	n	%
Year pump first appeared in the barangay		
Before 1960s	2	0.33
1960-1969	20	3.25
1970-1979	179	29.11
1980-1989	195	31.71
1990-1999	173	28.13
2000 and after	46	7.48
Year first used irrigation pumps		
Before 1960s	0	0.00
1960-1969	4	0.66
1970-1979	42	6.97
1980-1989	125	20.73
1990-1999	223	36.98
2000 and after	209	34.66
Major reason for using STW/OSP		
support rice crop for DS	327	56.67
support vegetable crop for DS	42	7.28
have better yield	52	9.01
due to insufficient water	10	1.73
others (to plant earlier, no other water source, to have second cropping, etc.)	146	25.30

Use of small-scale irrigation systems in rice-based farming in the Philippines

CC Launio and RB Malasa

This study aimed to (1) determine the irrigation facilities and sources used by rice-based farmers; (2) to determine the trend in investment in irrigation pumps; (3) estimate to some extent the conjunctive use of surface water from large irrigation systems and groundwater; and (4) determine the factors influencing private investments in pumps and tubewells. Data from the PhilRice-BAS RBFHS covering 1996 WS, 1997 DS, 2001 WS, 2002 DS, 2006 WS, 2007 DS, and 2011 WS were used in this study.

Highlights:

- Users of irrigation facilities other than NIS and CIS, such as shallow tubewells, open surface pumps, SWI and SFR increased from around 20% in the 1997 survey to around 30% in 2007 survey, and 40% in the 2011 WS survey. An increase in the number of farmers reporting the use of individual pumps along with NIS/CIS source is also noticeable.

- The number of rice-based farmers who reported owning irrigation pumps increased from only 9% in 1997 to 16% in 2007 and 19% in 2011. Most of these pumps are used with shallow tubewells and to draw water from rivers/creeks.

- Preliminary results show that factors positively influencing investment on irrigation pumps include: income, area, tenure, education, and attendance to training. Increase in rice price also appeared to increase the probability of investing in pumps.

Rice yield impacts of using pump irrigation systems relative to other sources of irrigation

CC Launio and RB Malasa

The study aims to document the effects of irrigation sources on rice yields with the focus on pump irrigation systems. The irrigation sources that are compared in this study are: NIS, CIS, pumps, SWIP, rivers, and rainfed.

Highlights:

- Table 4 shows the comparative mean of farmer-reported rice yields tabulated by irrigation source based on the 6-seasons PhilRice-SED-BAS rice-based farm household survey. Mean yield in farms with any kind of irrigation source is generally significantly higher relative to purely rainfed farms. Yields in NIS-supported farms, however, appear to be significantly higher relative to other parcels supported by pumps and other sources. Panel data analysis to confirm the correlation and attribution of the differences is being done.

- Using the Hausman-Taylor instrumental variables estimation of random effects, NIS-supported farms have yields 13% higher than rainfed farms, CIS users 18% higher, and pump users 8% higher. Yield impacts of using CIS and NIS significantly differed from impacts of pumps and rivers. Effect of using pumps, SWIP and rivers did not differ from each other.

- Such estimates when confirmed can be useful in larger impact and cost-benefit analyses for irrigation projects and polices. Decision-making and policymaking may benefit from knowing the benefits of irrigation relative to rainfed farming, but care should be taken in considering the differences in yield impacts across irrigation facilities in estimating benefits.

Table 4. Mean difference in yields (t/ha) by source of irrigation, 1996-2007

Year	NIS-CIS		NIS-Pumps		NIS-SWIP		NIS-Rivers		NIS-Rainfed	
1996WS	0.15	*	0.34	***	-0.09	ns	0.90	***	0.96	***
1997DS	0.37	***	0.25	**	1.02	***	0.78	***	1.58	***
2001WS	0.27	***	0.13	ns	0.26	*	0.52	***	0.92	***
2002DS	0.51	***	0.65	***	0.42	*	0.69	***	1.66	***
2006WS	0.33	***	0.36	***	0.72	**	0.97	***	1.39	***
2007DS	0.61	***	0.80	***	1.12	***	1.17	***	2.12	***
Pooled	0.35	***	0.41	***	0.54	***	0.71	***	1.34	***
Year	**CIS-Pumps**		**CIS-SWIP**		**CIS-Rivers**		**CIS-Rainfed**		**Rivers-Rainfed**	
1996WS	0.19	*	-0.24	ns	0.75	***	0.81	***	0.06	ns
1997DS	-0.12	ns	0.65	**	0.42	**	1.22	***	0.80	***
2001WS	-0.14	ns	-0.01	ns	0.25	*	0.65	***	0.40	**
2002DS	0.14	ns	-0.09	ns	0.18	ns	1.15	***	0.97	***
2006WS	-0.30	ns	0.39	ns	0.64	***	1.07	***	0.43	***
2007DS	0.19	ns	0.51	*	0.56	**	1.51	***	0.95	***
Pooled	0.06	ns	0.19	*	0.369	***	1.00	***	0.63	***
Year	**Pumps-SWIP**		**Pumps-Rivers**		**Pumps-Rainfed**		**SWIP-Rivers**		**SWIP-Rainfed**	
1996WS	-0.43	ns	0.55	***	0.62	***	0.99	***	1.05	***
1997DS	0.76	**	0.53	**	1.33	***	-0.24	ns	0.57	**
2001WS	0.13	ns	0.39	***	0.78	***	0.26	ns	0.66	***
2002DS	-0.23	ns	0.03	ns	1.01	***	0.26	ns	1.24	***
2006WS	0.36	ns	0.61	***	1.04	***	0.25	ns	0.68	*
2007DS	0.32	ns	0.37	ns	1.32	***	-0.06	ns	1.00	***
Pooled	0.135	ns	0.31	***	0.94	***	0.18	ns	0.81	***

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

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

This study assesses the midterm impacts of the fifth technical cooperation project between Philippine Rice Research Institute and Japan International Cooperation Agency (TCP 5). It examines data on rice and vegetable technology adoption, yield, income, and rice sufficiency index among farmers in Autonomous Region in Muslim Mindanao. Specifically, it attempts to: (1) determine the adoption level of rice and vegetable technologies among farmer-beneficiaries; (2) examine the projects' impact on rice yield of farmers; (3) evaluate the projects' impact on farmers' rice income; and 4) assess the impact of the project on the rice sufficiency level of the farmers' household.

Since TCP5 is in midway in its implementation, it is only appropriate to assess its midterm impacts. To properly evaluate the impacts of TCP5, baseline surveys were conducted in all project sites before it was implemented. Monitoring surveys were done during and after the project implementation. There are two batches of samples considered for the midterm assessment. Batch 1 refers to those who were interviewed in 2011 for its baseline and monitored in 2012 and 2013. Whereas, Batch 2 baseline and monitoring surveys were gathered in 2012 and 2013, respectively.
In addition to farmer-beneficiaries (FB), a group of non-participants (NP) was monitored to establish a counterfactual to know what will happen to households if the project did not occurred.
Results of the midterm evaluation points to increased adoption of the introduced rice and vegetable technologies through trainings conducted. There are also indications of positive impacts on yield and rice income of farmer-beneficiaries. However, the measured impacts are still below the targeted amount. Hence, additional refinements in the implementation are needed to further increase the project's impacts.

Highlights:

Increased adoption of the introduced rice and vegetable technologies among FB

- During the baseline period of Batch 1, not even one rice technology was followed. However, through the trainings conducted, at least 70% of them started to follow and adopt more recommended rice technologies. The number of technologies adopted by at least 70% of the farmers increased to 55% in 2012 and even higher in 2013 at 65%.

- Only synchronous planting was the technology adopted by at least 70% of Batch 2 in baseline 2012. But in 2013 monitoring period, 10 additional rice technologies were being followed.

- Only 2 out of 10 vegetable technologies were being used by at least 70% of Batch 1. Though it remarkably increased during the monitoring period in 2013 to 7 out of 10 technologies adopted.

- The least adopted rice and vegetable technologies or recommendations were those that use tools, procedural, and bought. In contrast, those with the most number of adopters were simple, free or can earn savings, and are related to accustomed practices.

Positive impacts on yield and rice income

- Batch 1 FB yield increased gradually from PhP2, 466 kg/ha in 2011 to PhP2,802kg/ha in 2012, and PhP2,931 kg/ha in 2013. While incurring almost the same expenses of PhP12, 430 in 2011, PhP12,031 in 2012, and PhP12,984 in 2013. They also sold their palay with better prices, from PhP15/kg in 2011 to PhP18/kg in 2013.

- In general, Batch 2 FB had also shown a progressive cropping season from the baseline. The yield increased, from 2,442 kg/ha in 2012 to 2,987 kg/ha in 2013. They sold it at better prices: PhP18/kg in 2012 and PhP19/kg in 2013. Though the FB incurred a slightly higher variable cost, it turned out that they had almost doubled their net income from PhP27, 985 to PhP42, 500 and exceeded NP's net income of PhP41, 362.

- Thus, the increase in yield while incurring almost the same expenses, selling in better prices only show that beneficiaries are gaining positive impacts from the project.

III. Policy Research and Advocacy

Project Leader: ACLitonjua

The project intends to strengthen the link between research and policymaking, hence intensifying the rice policy advocacy activities of the Institute. 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 and 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.

Linking Rice Research to Policy and Action

AC Litonjua, FH Bordey, DL Kitongan, and CLB Gado

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 policymakers. 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 policymaking.

Highlights:

- Updating of the Philippine Rice Industry Primer Series. The data of this publication were updated and improved. The initial draft is yet to be reviewed. This provides information on the trends and status of the rice sector.

- Rice Science for Decision-Makers (RS4DM). The article "How can rice trade liberalization affect consumers and producers?" was published. This policy brief presents results of statistical procedures that estimated the trade-lib effects. It also provides recommendations to policymakers. This material hopes to help craft decisions relating to international rice trade and provides information to fellow researchers.

- Seminar proceedings. The proceedings of the seminars "Rice Trade Policies and Rice Security: Future Directions" and "Palay, Bigas, Kanin: Managing Demand Towards Sufficiency" were readied for ISBN application.

- Policy Seminar. The seminar "Is rice research and development worth investing in?" was held. This created an avenue where stakeholders discussed and shed light on the role of rice Research and Development (R&D) on the PH's goal of attaining rice security. Several studies have shown the significant role of rice R&D. Despite these benefits, however, trends show underinvestment in R&D. Results of related studies need to be reiterated to our policymakers to promote deeper understanding and appreciation of rice R&D. Hence, this seminar was organized.

The Market Structure, Conduct and Performance (SCP) of Inbred and Hybrid Rice Seeds Industry in Region III
JC Beltran, CC Launio, AB Mataia, and DEC 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. Specifically it 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.

Highlights:

- A total of 182 seed producers, 32 seed centers and 210 farmer-adopters of quality seed in all provinces in Region 3 were personally interviewed using structured survey questionnaires. Survey data were analyzed using the structure, conduct and performance (SCP) framework and descriptive statistics.

- Rice seed industry in Region 3 followed the market structure-conduct-performance causality. The number of players and their marketing practices affected the performance of the players in the market. The seed industry behaved like a fairly competitive market as there were many players involved; seeds were differentiated according to seed class and varieties; players can easily enter and exit in the industry; and market information was easily and quickly exchanged among them.

- Seed producers in the region concentrate on inbred seed, and produces mostly certified and registered seeds. Overall, the structure of the inbred seed industry had a fairly competitive market with many buyers and sellers behaving independently of each other. The certified seed (CS) industry was highly competitive in structure where most of the seed producers had almost equal shares in the market in each province.

- Nueva Ecija had the most number of seed growers accounting to 62% of the total producers. On the contrary, the registered seed (RS) industry had an oligopolistic structure, particularly in Bataan, Pampanga and Tarlac, which can be explained by the small number of seed producers that were engaged into RS production.

- Some farmers in the region planted hybrid seeds. However, their seeds were sourced outside as there was no hybrid seed production in the region because the land was not suitable. Hybrid seed production, both public and private, is mostly done in Davao Oriental.

- Maintaining seed quality was observed to be one important strategy employed by seed producers against competitors. Seed production and distribution are enticing ventures. Seed production was more prices efficient and profitable than commercial rice production.

- The seed marketing system is still weak because every player at every level of the inbred seed supply chain has a freedom to plant various seed classes outside their role in the industry. There were no systems established to match seed requirements with production in the region. Some provinces encountered seed supply shortage, while others experienced excessive supply. This implies an unstable supply of seeds in the future, as no one is responsible for specific production. The government should consider giving accreditation to any capable and qualified individuals or groups to produce more than one seed class. This will optimize the scale of production among those who have the capacity to expand and enable those whose seeds were downgraded to dispose their seeds officially.

- Adoption rate of quality seeds can still be improved. There is a need to improve the current vertical integration structure of the inbred rice seed industry; consolidate seed requirements and production; develop the inbred seed marketing system;

strictly implement accreditation; and strengthen extension works.

IV. Special Projects/Studies

Palayabangan: The 10-5 Challenge (Cost and Returns Component)
RB Malasa , RTN Semilla, AB Mataia, RZ Relado, DP dela Cruz, LM Juliano, 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 is implemented in all PhilRice stations. Other rice-production stakeholders and PhilRice researchers were encouraged to join and showcase their technologies on attaining 10t/haat PhP 5.00/kg. The cost of production and yield for 2014 dry season (DS) 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 2014 DS, the costs were tabulated and yields were computed based on 14% moisture content to assess the productivity of each participant.

Highlights:

- There was one regional winner (able to achieve 10-5) and eight received consolation prizes (able to gain profit of at least PhP 80,000) in 2014 DS. The entry of Syngenta Philippines, Inc. in PhilRice-Isabela achieved 10-5 with a yield 10.54t/ha with cost amounting to only PhP 4.94/kg. The eight participants awarded with consolation prizes were: LGU-San Mateo, Mr. Terte, Dynapharm, Mr. Jarvinia, Mr. Sevilleja, Pioneer, SL-Agritech, and Organic Resource Biotic Multi-Purpose Cooperative. The first five were from contestants from PhilRice-Isabela and the rest were from PhilRice-CES.

- The NFA procurement price of dried palay (PhP 17/kg) was adjusted based on moisture content to compute for the farm operations or services that were paid in-kind, particularly fresh palay. This was to be able to standardize the “artificial” effect on cost of production brought by very high prevailing fresh price of palay in 2014 DS.

- The 2014 DS results show that using of combine-harvester, achieving 7.50t/ha yield at 14% MC and not acquiring services of maintainers would increase the chances of acquiring profit at least PhP 80,000 per hectare.

- Initial results for 2014 WS from PhilRice-Bicol, PhilRice-CES, PhilRice-LB, and PhilRice-Midsayap revealed that none of the participants achieved 10-5 and only one had profit that exceeded PhP 80,000. The results are still subject for validation.

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 and WB Collado

This study aims to provide relevant information on potential impacts of climate change on rice and corn yield. Using three global circulation model (MPEH, BCM2, and CNCM3), historical data were reanalyzed and used to project climate variables from 2011-2040 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:

- Based on the robust results that indicate significant yield change from 20C3M to A2 scenario caused by direct climate variables and climate-affected agronomic variables under the three GCM, irrigated rice yield for January-June harvest in 12 provinces will increase during 2011-2040 period. These provinces are Bataan, Biliran, Eastern Samar, Leyte, Northern Sama, Nueva Ecija, Occidental Mindoro, Pangasinan, and Samar. Southern Leyte, and Zamboanga del Norte. Results in Negros Oriental indicate conflicting directions of yield changes between 3 GCMs.

- The difference in January-June irrigated rice yield between A1B and 20C3M indicates significant positive changes in 10 provinces. These provinces are Bulacan, Eastern Samar, Leyte, Northern Samar, Nueva Ecija, Samar, Southern Leyte, Sultan Kudarat, Tarlca, and Zamboanga del Norte. However, the yield changes in Agusan del Norte, Negros Oriental, and Quezon could be negative.

- For irrigated rice yield in July-December harvest under A2 scenario, Bukidnon, Lanao del Norte, Misamis Occidental, Quezon, Zamboanga del Norte, and Zamboanga del Sur exhibited significant and positive yield change. Only Compostella Valley has negative change in yield under MPEH5.

- The provinces with robust, significant increase in irrigated rice yield during July-December under A1B scenario are Bukidnon, Lanao del Norte, Misamis Occidental, Siguijor, Zamboanga del Norte and Zamboanga del Sur. Yield could decline in Compostella Valley.

- Rainfed yield difference between A2 and 20C3M indicates increase in Batangas and Quezon while decline in Antique and Benguet.

- More provinces indicate potential decline in yield based on difference between A1B and 20C3M. Yield could decline in Biliran, Ilocos Norte, La Union, and Quirino. Meanwhile yield could increase in Batangas and Quezon.

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

FH Bordey, P Moya, J Beltran, C Launio, A Litonjua, R Manalili, A Mataia, J Besenio, F Macalintal, R Malasa, E Marciano, M Milanes, S Paran, G Redondo, R Relado, M San Valentin, I Tanzo, E Tulay, S Valencia, C Viray, and C Yusongco

This study compared the cost of producing palay in provinces/ states that represent the irrigated and intensively cultivated areas of six Asian countries. The selected sites are Nueva Ecija, Philippines; Zhejiang, China; West Java, Indonesia; Tamil Nadu, India; Suphan Buri, Thailand; and Can Tho, Vietnam. At least 100 farmers were interviewed in each location to get data on yield, input uses, prices of palay and inputs, and cost of production. The study covered the palay harvested in 2013. Except for Can Tho which has three crops per year, the other locations have two crops which are reported here as January-June and July-December harvests.

Highlights:

Yield and Cost of Production

- For January-June harvest, palay yield in Nueva Ecija (6.34mt/ha) ranked fourth but is not significantly different with yields in West Java (6.67mt/ha) and Zhejiang (6.56mt/ha). Only Can Tho has significantly higher yield at 6.81 (mt/ha). Meanwhile, Nueva Ecija has higher yield than Suphan Buri (5.69mt/ha) and Tamil Nadu (4.77mt/ha).

- For July-December harvest, Nueva Ecija got the lowest yield of 3.91mt/ha due to effect of typhoon Santi. Nevertheless, the normal yield of farmers when they are not directly hit by a typhoon was around 4.50mt/ha, which is still the lowest among the six sites. This season, Zhejiang got the highest yield of 8.02mt/ha due to 100% use of hybrid seeds. West Java was second with 7.01mt/ha. Yield in Can Tho (6.12mt/ha) is slightly lower than its previous season because July-September is their wetter season. Suphan Buri's yield improved to 6.09 mt/ha but still lower than in Can Tho. Yield in Tamil Nadu is relatively stable at 4.71mt/ha.

- Only Can Tho has a third crop with a yield of 9.44 mt/ha. This crop was planted after its annual flooding during October. The flood replenishes the nutrients in the soil making the area highly fertile for production.

- Due to above-mentioned factors, Nueva Ecija has the second lowest annual yield of 10.25mt/ha, higher only compared to Tamil Nadu. In contrast, Can Tho has the highest annual yield of 22.37mt/ha.

- In the first season, Nueva Ecija also ranked fourth in terms of cost per kilogram. It takes about PhP 9.96 to produce a kilogram of palay in Nueva Ecija during January-June. Tamil Nadu, Suphan Buri, and Can Tho, which are all part of exporting countries, have costs of PhP 8.11, 9.10, and 6.84/kg, respectively. Zhejiang and West Java, which are part of importing countries, have costs of PhP 13.24 and 12.97/kg. The cost of production in Nueva Ecija is at least competitive against the other importing countries but still fell short relative to exporting countries.

- The second season revealed a more alarming result. This time, Nueva Ecija got the highest cost per kilogram at PhP 13.95 indicating that it is the least competitive at the farm level. Although the production cost per hectare in Nueva Ecija is even smaller in the second season than in the first season, the huge drop in its yield level resulted in high cost per kilogram. Unit costs in Zhejiang (PhP13.94/kg) and West Java (PhP 13.34/kg) were not far away. However, the costs per kilogram in the provinces of exporting countries are way below: PhP 8.32 for Tamil Nadu; 8.38 in Suphan Buri; and 7.30 in Can Tho.

- The cost of producing a kilogram of the third season palay in Vietnam is even lower at only PhP 4.71. If most of Vietnam's exports come from this season and this type of ecosystem, it is not surprising that they were able to lower their price of milled rice at the world market. However, it was noted from key informant interviews that the quality of rice exported by Vietnam is not as good as Thai rice exports.

Lessons Learned from Other Countries

- Lower labor cost is the key factor why the other countries, especially the three exporters, were able to lower their cost per kilogram. Mechanization particularly that of harvesting and threshing plays a major role. At least 97% of farmers in Can Tho, 99% in Tamil Nadu, and 100% in Suphan Buri used combined harvester-thresher. In contrast, only 3-5% of farmers in Nueva Ecija used that machine.

- The use of direct seeding as mode of crop establishment in Can Tho and Suphan Buri also further the reduction in labor cost. On the contrary, about 79-99% of Nueva Ecija farmers transplanted rice, which required more labor. As a result, the annual labor productivity in Nueva Ecija is second to the lowest at 74kg/man-day while that in Suphan Buri and Can Tho are 566 and 348, respectively.

- In cases wherein shift to direct seeding is infeasible, the lower seeding rate used in West Java (16 to 17kg/ha) could be worthy of emulation. Farmers in West Java were able to reduce their seeding rate because of straight row planting, and use of 1 to 2 seedlings per hill.

- The low usage of pesticides in Tamil Nadu is also a good practice that could be replicated. On average, Tamil farmers applied only twice per season. While Nueva Ecija farmers applied only five times in a season, it can be further improved to approach that in Tamil Nadu. In contrast, there are 6 to 8 times pesticide applications per season in Suphan Buri; 7 to15 times in Zhejiang; 11to12 times in Can Tho; and 17 times in West Java. The intensive use of pesticide especially in exporting countries could lead to high residue in their rice product that we should test for.

- In terms of seeds, the use of hybrid varieties during appropriate season in Zhejiang led to their higher yield. Nevertheless, the use of hybrid was not able to lower the cost per kilogram in Zhejiang because of its labor-intensiveness and higher use of material inputs. It must be noted that labor in China is increasingly becoming expensive because of their industrialization.

- Nutrient management is another area where we can learn from other countries. It was found that nitrogen productivity in Nueva Ecija is the third least among six sites. On average, only 46 kilogram of paddy is produced for every kilogram of nitrogen applied. In contrast, 71 and 77 kilogram of paddy are produced in Suphan Buri and Can Tho for every kilogram of nitrogen applied. It was also observed that application of nitrogen in Nueva Ecija during January-June was not significantly different in July-December. This means that Nueva Ecija farmers were not able to maximize the potential yield during dry season (January-June) when palay is more responsive to nitrogen due to higher solar radiation

Adoption of Crop Insurance in the Philippines: Lessons from Farmers' Experience

FH Bordey and IA Arida

This article aims to determine the risk-mitigating behavior of Filipino rice farmers in general and their utilization of crop insurance in particular. First, the general coverage of rice insurance and the types of insurance policies offered by the Philippine Crop Insurance Company were discussed. Then, the perception and level of awareness of rice farmers about crop insurance were assessed. Similarly, the determinants of crop insurance adoption were identified. Through this, the article generated policy recommendations that can improve the provision of crop insurance services 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:

- Results revealed that adoption of insurance is generally low in all provinces. Only 10%of the total respondents have participated in a rice insurance program from 2007 to 2012. Among the three provinces, Nueva Ecija had the highest percentage of crop insurance adoption with 20% followed by Leyte with 5%. Iloilo respondents are least adopters of insurance with less than 3%adoption.

- About 68% of the farmers who participated in a rice insurance program have purchased the traditional type of insurance while 27% have experienced enrolling their crop under a weather based index insurance (WBII) program. Nueva Ecija and Leyte were the only provinces with farmers who have adopted WBII.

- In general, 39% of the farmers who insured their rice crop acquired information about insurance from bank or lending agencies. Other major sources of information about crop insurance are: PCIC (16%); cooperatives (14%); and micro-lending agency such as Alalay sa Kaunlaran, Incorporated or ASKI (17%).

- Attractive policy is the top reason given as indicated by 38% of those who availed of insurance program. Accessibility to credit is another major reason cited by 32% of the insured farmers. Sense of security with the investments in rice production was also considered by 22% of farmers who adopted crop insurance. Results also showed that co-farmers have a great influence in farmer's decision to participate in an insurance program.

- Two out of three farmers who have not enrolled in any crop insurance before are still hesitant to try it in the future. This is particularly true in Iloilo and Leyte where 79 and 91% of farmers are unwilling to try crop insurance. In contrast, Nueva Ecija farmers showed openness with 60% of them indicated willingness to try on crop insurance program in the next cropping seasons. Thirty–five percent of respondents in three provinces cited additional financial burden as the main reason not enrolling in a rice insurance program. Lack of awareness on its existence was also found to be a limiting factor in farmer's participation in this program as cited by 25% of the respondents. On other hand, 28%of respondents stated that lack of funds to pay for the insurance premium was also a hindrance in adoption of crop insurance.

- Nearly half of the total respondents suggested that information campaign on crop insurance should be strengthened. Farmers have also recommended that insurance providers should lower their premium rates (24%) to ease them from financial burden. Other suggestions include proper implementation of the program, simplified requirements and procedure, and provision of calamity support.

- The probit model estimation revealed that the area planted to rice, sex, access to remittances and capital, and participation in seminars related to rice farming are significant and positively affecting the probability of adopting insurance. In contrast, membership in farmers' association is negatively associated with crop insurance adoption. Nueva Ecija farmers are also found to be more likely to adopt crop insurance compared to Leyte, which is the benchmark province. The model also correctly predicted 82% of the observations, based from the expected percent correctly predicted (ePCP) estimation.

- Marginal effects were calculated in order to estimate the changes in the probability of adopting crop insurance given a unit change in the explanatory variable, conditional on holding other factors constant. Result shows that the probability of adopting agricultural insurance increases by 5%/haincrease in farm area. This can be explained by the fact that farmers who cultivate larger area face greater production and income loss given the event of a crop failure. Hence, farmers with larger farm size could have higher probability to insure crops.

- Similarly, male rice farmers are 15 %more likely to adopt crop insurance than women farmers, holding all other factors constant. This might be explained by the social norm that men are usually the main decision-makers in the household. Results also indicated that farmers' access to credit and remittances increase the chance of participation in crop insurance by 7 and 14%, respectively. Farmers who borrow capital need to assure creditors of their ability to pay even at the event of crop failure, hence the need to insure their crops. Meanwhile, farmers who received remittances are more financially capable of purchasing insurance services compared to those who have no additional income source.

- Attendance to seminars or trainings related to rice farming also raises the probability of adopting crop insurance by 7%. Rice farming seminars exposed farmers to additional knowledge and information regarding farm management strategies including agricultural insurance. Hence, attendance to rice-related training may have created a positive effect on farmers' decision to adopt insurance.

- Provincial location particularly in Nueva Ecija also has positive effect in the farmers' decision to enroll in crop insurance. Respondents who lived in Nueva Ecija are 19%more likely to adopt crop insurance compared to farmers in Leyte. Meanwhile, Iloilo farmers have similar propensity with those in Leyte in terms of availing of crop insurance. Many factors could have contributed to this but one stands out. Nueva Ecija is commonly traversed by tropical storms that enter the Philippine Area of Responsibility particularly during the wet season. Recognizing that strong wind and typhoons are major causes of rice damage, Nueva Ecija farmers could be sensitive to this hazard and enroll in crop insurance program.

- It is interesting to note that membership in farmers' association reflected a negative effect in farmer's decision to adopt crop insurance. On average, members of farm association are 14% less likely to adopt insurance than non-members. It is possible that members of farmer's association find social and financial security within their organization and are thus less likely to invest in crop insurance.

Gender and Development Initiatives

IR Tanzo, JBA Duldulao, C Narvadez, LM Juliano, RI Salas, and JN Lisondra

The project was conceptualized mainly to carry out activities addressing gender-related concerns of the Institute. By doing such, the Institute will improve its outreach to all rice stakeholders and optimize contributions to research and development. The mainstreaming of gender in the Institute's activities is in response to Republic Act 7192 (otherwise known as the Women in Development and Nation Building Act), which affirms the State's recognition of women's role in nation building.

Highlights:

- Coordinated training for rural women on mushroom production as a possible source of additional income for the rice farm household

- As observed in past years, all employees and contractors were required to wear a white upper garment last March 7 and 28. The proposed dates of wearing white were connected with the adoption of the IRR of the MCW, the National Women's

Day, and the Women's Right and International Peace Day. The event became more memorable and special as a simple and inexpensive token were given to the first 100 staff (male and female) who wore white last March 28.

- Awarding them with a medal, gift, and certificate honored the seven beneficiaries of the Fund for the Future Scholarship. One of the FFF scholars shared her testimony as an FFF scholar and served as the exhortation for the flag ceremony of the Institute.

- Coordinated a gender and entrepreneurial training which was attended by the GADi team (CES and branch stations) and selected CES staff. This capacitated the staff on how women can be empowered economically, which was in line with the banner program of the Institute (1 milyon kada hektarya kada taon).

- Coordinated a basic gender and development training for the GADi team from the CES and stations to capacitate the members who have no basic training on gender and development.

- Provided technical assistance on gender for several agencies foremost of which is the University of the Philippines at Los Banos.

- Co-coordinated the PhilRice Daycare.

- Presented a paper entitled "Women and Weedy Rice" at the Pest Management Council of the Philippines. The study showed that women needed to be included in extension activities as they have several misconceptions about weedy rice. Not correcting these misconceptions will possibly aggravate weedy rice in the province.

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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