PHILIPPINE RICE R&D HIGHLIGHTS 2012

Socio-Economics Division

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Socioeconomics

Division Head: Rhemilyn Z. Relado

The Socioeconomics Division (SED) implements projects and studies that contribute to the development of rice statistical databases and improvement of socioeconomic research methodologies. These two major thrusts of the division are important in understanding the Philippine rice industry through rice statistics. Within the Institute, SED has made significant contributions to the IEPRA Program.

In 2012, the division focused on the quinquennial monitoring of rice-based farm households in major rice-producing provinces in the Philippines. As the survey required data from two planting seasons, results are yet to be shown. The other 2012 studies delved into seemingly different topics but still dealt with the socioeconomic aspect of rice issues. One is core-funded while the other two are externally-funded studies.

The first study is concerned with updating rice-related statistics to continuously provide information to development planners for a sound decision making. The second study dealt with assessing the trainings in support to the Rice Self-Sufficiency Program of the Department Agriculture. The last one revealed the linkages of climate change, yield, and migration in the Philippines.

Updating Rice and Rice-Related Statistics

GO Redondo and RF Tabalno

In collaboration with the Bureau of Agricultural Statistics (BAS), the study uses compiled secondary rice statistics. The secondary data are then tabulated and disaggregated at the provincial level. For data not found in BAS, they are requested and coordinated with other agencies. Electronic copies of the compiled data are published at the PhilRice website through the database management.

Highlights:

- Palay production in 2011 was 16.68mmt. The irrigated area has a total production of 12.36mmt. Area harvested in 2011 was 4.54m hectares. The average yield was 3.72mt/ha. The yield in irrigated areas was 4.22mt/ha compared to only 2.97mt/ha in rainfed areas. See Figure 1.

- The top 5 producing provinces were Nueva Ecija, Isabela, Iloilo, Pangasinan, and Cagayan. Half of farmers' produce were sold (50.65%) and only 23% were left for home consumption.

- The highest volume of rice is produced in December and September right after the wet season harvest and April and March for the second season harvest.

- Total labor used in palay farms was 58.72 man days. The farm operations with the higher labor requirements were planting and transplanting (11.15md), harvesting and threshing (14.09md), and crop care (7.83md).

- In 2010, the average gross return per hectare was PhP53,859. Irrigated areas had higher gross returns than the average for all ecosystems. See Table 1.

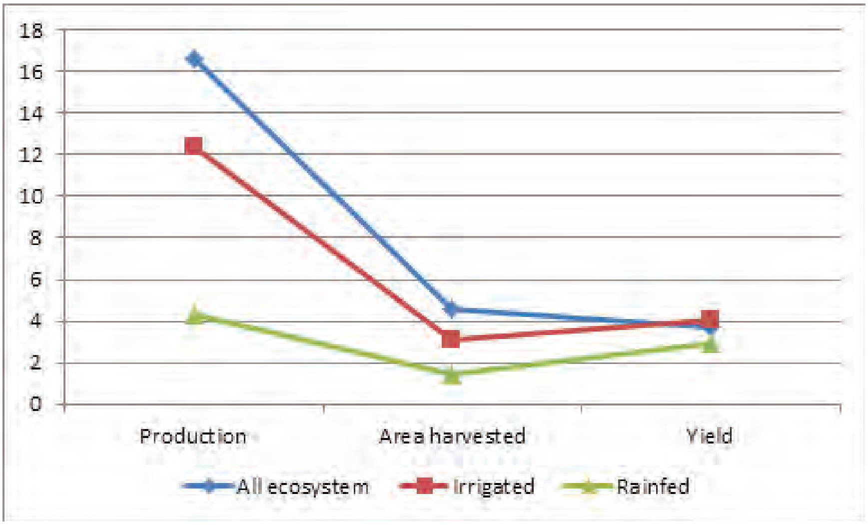

Figure 1. Estimated production, area harvested and yield, Philippines, 2011.

Table 1. Average palay production costs and returns (in pesos), Philippines, 2010

	All Farms	Irrigated	Non-irrigated
Cash costs	15,859	17,955	11,467
Non-cash costs	13,621	15,101	10,171
Imputed costs	9,820	9,648	10,185
Total costs	39,300	42,704	31,823
Gross returns	53,859	59,272	39,019
Net returns	14,559	16,568	7196
Net profit-cost ratio	0.37	0.39	0.23
Cost per kilogram	10.85	10.71	12.13
Yield per hectare in kilograms	3,622	3,986	2,624
Farmgate price per kilogram	14.87	14.87	14.87

Monitoring and Evaluation Component (of the PRSSP SubProject 3: Unified Capability-Building Support)
IR Tanzo and CG Yusongco (with IRRI counterpart)

The project monitored and evaluated the initial impact of the Rice Self Sufficiency Program (RSSP) training activities and technologies. These served as feedback mechanism to concerned rice stakeholders to continuously improve the delivery of appropriate rice technologies and information to the Filipino farmers. These ensure large scale farmer adoption and consequently contribute to attaining rice self-sufficiency. The M&E involved farmer surveys (using a “with” and “without” training comparison), ethnography, and extension personnel survey. The farmer respondents were categorized into: a) FFS farmers – farmers with FFS training or graduates of the season-long FFS PalayCheck training; b) Non-FFS farmers – farmers without FFS training but from the same barangays as those with FFS training; and c) control farmers – farmers without FFS training from barangays where no FFS training has been conducted.

Highlights:

A. Farmer Survey

- The survey covered 936 respondents in three major rice provinces: Agusan del Norte, Iloilo, and Isabela. Results presented are only for Agusan del Norte as data cleaning is still being done for the two other provinces.

- The respondents: 51-years old and had finished eight years of schooling on the average, 57% were males, and 85% were married.

- Farm characteristics of the respondents: cultivated 1.35ha (DS) and 1.42ha (WS); more than 40% of the parcels were either owned or leased/rented; and NIA (48%) was the most common source of irrigation.

- The FFS farmers: (a) had the highest average production and yield compared with Non-FFS and Control; (b) reported the highest percentage that used certified seeds for both seasons; (c) used the least quantity of seeds (68kg/ha) during the DS but the highest seed rate (72kg/ha) during the WS; (d) reported the lowest average utilization of both chemical and organic fertilizer during the WS; (e) used the highest volume of herbicides during the DS and insecticides during the WS.

- Total cost of production of all farmer categories was not statistically different between seasons.

- Difference in yield among farmer categories was not significant even across seasons.

- The insignificant yield differences among farmer categories did not cause any significant difference in income.

- With regards to the five groups of knowledge statements (based on the PalayCheck recommendations and focused on the five major rice production activities) presented to the farmers, there were no significant differences among the responses across the farmer categories.

B. Ethnography

- The study was done in the village of Abilan, Buenavista, Agusan del Norte where a field researcher immersed in the area for four months.

- Farmer's participation in the FFS-PalayCheck program was influenced by; livelihood strategies, gender roles, attitudes, and communication.

- Agricultural technologies are still to be extensively adopted by the farmers but some management techniques in the PalayCheck system were being practiced already.

- Rice farming was found to be a rural phenomenon.

C. Extension Personnel Survey

- The survey covered 52 respondents in five municipalities of Agusan del Norte.

- Majority (63%) confidently viewed themselves as the farmers’ source of knowledge.

- Almost one-third (27%) reported the lack of farmer’s commitment as a major constraint in the implementation of the FFS PalayCheck training.

- Though majority (88%) said they were comfortable with computers and mobile phones as tools for sharing information, only 42% have Internet access in the work place.

- More than half (53%) were aware of the Pinoy Rice Knowledge Bank but only 45% accessed it for their extension activities.

Linking Climate Change, Rice Yield and Migration: The Philippine Experience

FH Bordey, CC Launio, EJP Quilang, CMA Tolentino, and NB Ogena

This study examined whether climate change, through its rice productivity impacts, induced domestic and international out-migration in the Philippines. Productivity variables such as rice yield and farm revenue, as instrumented by five-year measures of weather variables, were used to explain migration in a fixed–effects two–stage least squares estimation. In addition, differences in climate change-induced migration between men and women were also determined. A hindcast of potential migration situation under a scenario of no climate change-induced productivity decline was also made.

Highlights:

- A 1^{o}C increase in five-year average of minimum temperature during summer (January-June) decreased the five-year average yield by 64kg/ha. Higher minimum temperature increases the respiration rate resulting in reduced tillers per plant, lower plant height and biomass, and greater number of unfilled grains leading to a decline in yield.

- Five-year average of rice yield diminished by 36kg/ha for every 1% increase in the five-year average share of wet days in a year. The lower solar radiation during wet days (a day with more than 5mm rainfall) resulted in lower energy for photosynthetic activity. Similarly, a 1% increase in the occurrence of wet days decreased rice farm income by PhP356.00 per hectare on average.

- The number of total OFW increased by five persons per thousand population for every one metric ton decrease in average yield. Similarly, the number of total OFW rose by one person per thousand population for every PhP 1,000 decline in the average gross revenue per hectare.

- The number of female OFWs increased by seven per thousand female population when a one metric ton decrease in average yield was observed. Likewise, one female OFW per thousand population migrated-out for every PhP 1,000 decline in gross revenue per hectare. In contrast, climate change-induced decline in rice productivity had an insignificant effect on the number of male OFWs per thousand population.

- Domestic (inter-regional) migrants decreased by less than one person per thousand population for every PhP 1,000 decrease in average gross income per hectare

- Five-year average of rice yield could have been higher by 195kg/ha if January-June minimum temperature had not risen by 1^0 C and if share of wet days in a year had not increased by 3.8 percentage points from 1995 to 2009. Further, gross revenue per hectare could be higher by PhP1,352 if not for the increased number of wet days. On aggregate level, an additional 742,000mt of paddy rice could have been produced or PhP 5.14 billion revenues could have been earned by farmers in the same period if not for the decline in rice productivity and income induced by climate change;

- About 99,000-102,000 Filipinos of which 57% are female have worked abroad because of the long-term decline in rice productivity and revenue due to climate change. In contrast, about 19,000 individuals were not able to migrate inter-regionally due to the reduced rice gross revenue per hectare, as affected by increased share of wet days in a year.

Abbreviations and acronymns

ABA – Abscicic acid
Ac – anther culture
AC – amylose content
AESA – Agro-ecosystems Analysis
AEW – agricultural extension workers
AG – anaerobic germination
AIS – Agricultural Information System
ANOVA – analysis of variance
AON – advance observation nursery
AT – agricultural technologist
AYT – advanced yield trial
BCA – biological control agent
BLB – bacterial leaf blight
BLS – bacterial leaf streak
BPH – brown planthopper
Bo - boron
BR – brown rice
BSWM – Bureau of Soils and Water Management
Ca - Calcium
CARP – Comprehensive Agrarian Reform Program
cav – cavan, usually 50 kg
CBFM – community-based forestry management
CLSU – Central Luzon State University
cm – centimeter
CMS – cystoplasmic male sterile
CP – protein content
CRH – carbonized rice hull
CTRHC – continuous-type rice hull carbonizer
CT – conventional tillage
Cu – copper
DA – Department of Agriculture
DA-RFU – Department of Agriculture-Regional Field Units
DAE – days after emergence
DAS – days after seeding
DAT – days after transplanting
DBMS – database management system
DDTK – disease diagnostic tool kit
DENR – Department of Environment and Natural Resources
DH L– double haploid lines
DRR – drought recovery rate
DS – dry season
DSA - diversity and stress adaptation
DSR – direct seeded rice
DUST – distinctness, uniformity and stability trial
DWSR – direct wet-seeded rice
EGS – early generation screening
EH – early heading
EMBI – effective microorganism-based inoculant
EPI – early panicle initiation
ET – early tillering
FAO – Food and Agriculture Organization
Fe – Iron
FFA – free fatty acid
FFP – farmer's fertilizer practice
FFS – farmers' field school
FGD – focus group discussion
FI – farmer innovator
FSSP – Food Staples Self-sufficiency Plan
g – gram
GAS – golden apple snail
GC – gel consistency
GIS – geographic information system
GHG – greenhouse gas
GLH – green leafhopper
GPS – global positioning system
GQ – grain quality
GUI – graphical user interface
GWS – genomwide selection
GYT – general yield trial
h – hour
ha – hectare
HIP - high inorganic phosphate
HPL – hybrid parental line
I - intermediate
ICIS – International Crop Information System
ICT – information and communication technology
IMO – indigenous microorganism
IF – inorganic fertilizer
INGER - International Network for Genetic Evaluation of Rice
IP – insect pest
IPDTK – insect pest diagnostic tool kit
IPM – Integrated Pest Management
IRRI – International Rice Research Institute
IVC – in vitro culture
IVM – in vitro mutagenesis
IWM – integrated weed management
JICA – Japan International Cooperation Agency
K – potassium
kg – kilogram
KP – knowledge product
KSL – knowledge sharing and learning
LCC – leaf color chart
LDIS – low-cost drip irrigation system
LeD – leaf drying
LeR – leaf rolling
lpa – low phytic acid
LGU – local government unit

LSTD – location specific technology development
m – meter
MAS – marker-assisted selection
MAT – Multi-Adaption Trial
MC – moisture content
MDDST – modified dry direct seeding technique
MET – multi-environment trial
MFE – male fertile environment
MLM – mixed-effects linear model
Mg – magnesium
Mn – Manganese
MDDST – Modified Dry Direct Seeding Technique
MOET – minus one element technique
MR – moderately resistant
MRT – Mobile Rice TeknoKlinik
MSE – male-sterile environment
MT – minimum tillage
$mtha^{-1}$ - metric ton per hectare
MYT – multi-location yield trials
N – nitrogen
NAFC – National Agricultural and Fishery Council
NBS – narrow brown spot
NCT – National Cooperative Testing
NFA – National Food Authority
NGO – non-government organization
NE – natural enemies
NIL – near isogenic line
NM – Nutrient Manager
NOPT – Nutrient Omission Plot Technique
NR – new reagent
NSIC – National Seed Industry Council
NSQCS – National Seed Quality Control Services
OF – organic fertilizer
OFT – on-farm trial
OM – organic matter
ON – observational nursery
OPAg – Office of Provincial Agriculturist
OpAPA – Open Academy for Philippine Agriculture
P – phosphorus
PA – phytic acid
PCR – Polymerase chain reaction
PDW – plant dry weight
PF – participating farmer
PFS – PalayCheck field school
PhilRice – Philippine Rice Research Institute
PhilSCAT – Philippine-Sino Center for Agricultural Technology
PHilMech – Philippine Center for Postharvest Development and Mechanization
PCA – principal component analysis
PI – panicle initiation
PN – pedigree nursery
PRKB – Pinoy Rice Knowledge Bank
PTD – participatory technology development
PYT – preliminary yield trial
QTL – quantitative trait loci
R - resistant
RBB – rice black bug
RCBD – randomized complete block design
RDI – regulated deficit irrigation
RF – rainfed
RP – resource person
RPM – revolution per minute
RQCS – Rice Quality Classification Software
RS4D – Rice Science for Development
RSO – rice sufficiency officer
RFL – Rainfed lowland
RTV – rice tungro virus
RTWG – Rice Technical Working Group
S – sulfur
SACLOB – Sealed Storage Enclosure for Rice Seeds
SALT – Sloping Agricultural Land Technology
SB – sheath blight
SFR – small farm reservoir
SME – small-medium enterprise
SMS – short message service
SN – source nursery
SSNM – site-specific nutrient management
SSR – simple sequence repeat
STK – soil test kit
STR – sequence tandem repeat
SV – seedling vigor
t – ton
TCN – testcross nursery
TCP – technical cooperation project
TGMS – thermo-sensitive genetic male sterile
TN – testcross nursery
TOT – training of trainers
TPR – transplanted rice
TRV – traditional variety
TSS – total soluble solid
UEM – ultra-early maturing
UPLB – University of the Philippines Los Baños
VSU – Visayas State University
WBPH – white-backed planthopper
WEPP – water erosion prediction project
WHC – water holding capacity
WHO – World Health Organization
WS – wet season
WT – weed tolerance
YA – yield advantage
Zn – zinc
ZT – zero tillage

List of Figures and Tables

Department of Agriculture

PHILRICE®

PHILIPPINE RICE RESEARCH INSTITUTE

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 technologies 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 58 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-sufficiency; 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 (Environmental Management), and OHSAS 18001:2007 (Occupational Health and Safety Assessment Series).

Central Experiment Station
Maligaya, Science City of Muñoz, 3119 Nueva Ecija
Trunklines: (44) 456-0277, -0285 • Telefax: (044) 456-0441
Email: prri@email.philrice.gov.ph

PhilRice Agusan
Basilisa, RTRomualdez, 8611 Agusan del Norte
Tel/Fax: 343-0768; 343-0778
Email: agusan@email.philrice.gov.ph

PhilRice Batac
MMSU Campus, Batac City, 2906 Ilocos Norte
Tel/Fax: (77) 792-4702; 670-1867
Email: batac@email.philrice.gov.ph

PhilRice Bicol
Batang, Ligao City, 4504 Albay
Cell: 0908-884-0724

PhilRice Isabela
San Mateo, 3318 Isabela
Tel: (78) 664-2954 • Fax 664-2953
Email: san_mateo@email.philrice.gov.ph

PhilRice Los Baños
UPLB Campus, Los Baños, 4030 Laguna
Tel: (49) 536-1917
Email: los_banos@email.philrice.gov.ph

PhilRice Midsayap
Bual Norte, Midsayap, 9410 North Cotabato
Tel: (64) 229-8178 • Fax 229-7242
Email: midsayap@email.philrice.gov.ph

PhilRice Negros
Cansilayan, Murcia, 6129 Negros Occidental
Cell: 0928-506-0515
Email: negros@email.philrice.gov.ph

PhilRice Field Office
CMU Campus, Maramag, 8714 Bukidnon
Tel/Fax: (88) 222-5744

PhilRice Liaison Office
3rd Flr, ATI Bldg., Elliptical Road,
Diliman, Quezon City
Tel/Fax: (02) 920-5129
Cell: 0920-906-9052

PhilRice Farmers' Text Center
0920-911-1398

PinoyRice Knowledge Bank
www.pinoyrkb.com

PhilRice Website
www.philrice.gov.ph

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