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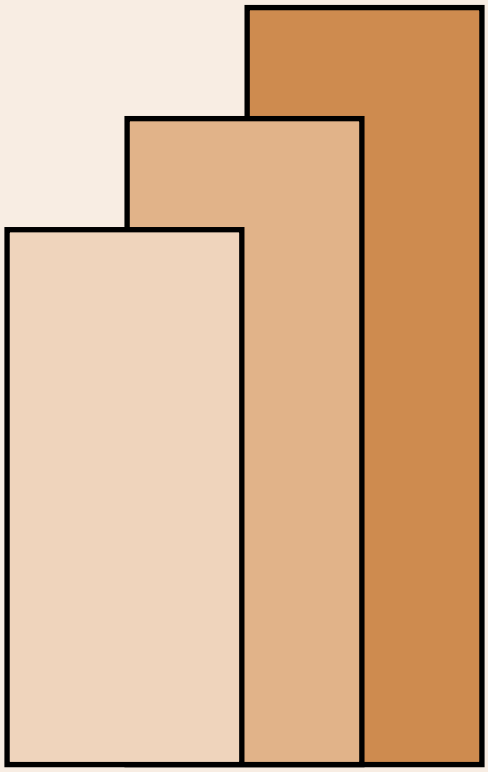

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Evaluation of the Impact of the Agricultural Insurance Program of the Philippine Crop Insurance Corporation (PCIC) on Rice Producers in Region VI (Western Visayas)

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Abstract

Rice is the most important agricultural commodity in Western Visayas, being one of top producers of rice in the country. Rice production however is a highly risky venture in a disaster-prone Philippines. Output declines were observed in the recent years mostly due to natural disasters. Moreover, majority of the rice farms in the region are small farm holders who are more vulnerable to crop damages and diseases. To reduce small farmers' vulnerability, the government provides social insurance through the Philippine Crop Insurance Corporation (PCIC).

Crop insurance is viewed as a risk management tool that can stabilize farmer's income and consumption after experiencing perils hence a promising strategy to reduce poverty. Presently, Philippine Crop Insurance Corporation survives out of a huge subsidy from the government. With the substantial amount of public funds that goes to PCIC, it is important to know whether its services brings positive impacts to small-scale farmers.

The results of the impact evaluation showed that crop insurance had a positive impact on rice farmers during the period of observation. It increased access to credit, smoothen consumption and increased net income from rice production. The impact on income is particularly pronounced among smaller farms. It is recommended that PCIC should expand to small farm holders to maximize the benefits of the crop insurance program.

Keywords: Impact Evaluation, Crop Insurance, Rice farmers, Western Visayas

Chapter 1: Introduction

Rationale

Agriculture is an important sector in Western Visayas for its contribution to the regional economy and employment. The most recent statistics in 2014 show that agriculture's gross value added (GVA) in the region amounts to Php61,309,000 or 8.54 percent of the national aggregate. This is the fourth highest in the country, next to Central Luzon, Calabarzon and Northern Mindanao. In terms of employment, the agricultural sector in region VI employs the most number of people with an incidence of 1.206 million or 10.22 percent of the total agricultural employment in the country. Unfortunately, the declining performance of agriculture at the national level can also be observed in Western Visayas. For the years 2012 to 2014, the average decline in GVA in real terms in agriculture in the region is roughly more than two percent. Meanwhile, labor statistics reveal that agricultural workers are among the lowest wage earners compared to other sectors in the country (Albert, 2013). It is not surprising therefore for poverty in agriculture to be pervasive and not improving since 2006. Given the challenges posed by climate change and disasters plaguing the country, farmers are even more vulnerable to income losses, poverty and food insecurity.

Because of the heavy reliance of a large number of people on agriculture, the government has been providing various agricultural projects to enhance production and secure livelihoods. One of these is the provision of agricultural insurance to lessen farmers' vulnerability to crop diseases and natural disasters. Agricultural insurance or crop insurance is a risk-mitigating

scheme that aims to maintain small farmers' income and consumption following a disaster that caused crop destruction and losses.

Currently, the Philippine Crop Insurance Corporation (PCIC) carries out its services owing to a huge subsidy provided by the government through its various programs for marginalized groups such as the agrarian reform beneficiaries (ARBs). For more than three decades from 1981 to 2013, however, PCIC has been operating on a negative average net income of Php 8.417 million (Reyes et al., 2015). Without these subsidies, PCIC will not be viable financially and hence cannot sustain itself. With the substantial amount of public funds that goes to PCIC, it is important to know whether it creates positive impacts on small-scale farmers' income and standard of living.

This research is part of the bigger study headed by Dr. Celia Reyes of the Philippine Institute for Development Studies (PIDS). The focus of this study is the impacts of PCIC's crop insurance on the wellbeing and the ability to cope with risks of rice farmers in Western Visayas.

Background on Philippine Crop Insurance Corporation and its Insurance Products for Rice

The Philippine Crop Insurance Corporation (PCIC), a government owned and controlled corporation under the Department of Agriculture (DA), is the sole provider of crop insurance in the country. The basic mandate of PCIC is *to provide insurance protection to the country's agricultural producers particularly the subsistence farmers, against loss of their crops and/or non-crop agricultural assets on account of natural calamities such as typhoons, floods, droughts, earthquakes and volcanic eruptions, plant pests and diseases, and/or*

other perils, as well as provide guarantee cover for production loans extended by lending institutions to agricultural producers for crops not yet covered by insurance." (Lifted from PCIC website, italics mine).

Rice insurance is one of the first and major products of PCIC. *The object of the insurance is the standing rice crop planted on the farmland specified in the insurance application and which the assured farmer has an insurable interest on (lifted from the PCIC brochure, Italics mine).*

Coverage is based on cost of inputs shown by the farm plan and budget, plus an additional amount of up to 20 percent of the expected yield value. The maximum cover is Php41, 000 – Php50,000 for inbred varieties and Php50,000 – Php65,000 for hybrid. Rice insurance is of two types, one that covers multiple risks and another that assures only of losses arising from natural disasters. Multi–risk covers crop losses brought about by natural disasters, pest infestation (rats, locusts armyworms/cutworms, stemborer, blackbugs and brown planthopper/hopperburn) and plant diseases (tungro, rice blast/neck rot, grassy stunt, bacterial leaf blight and sheath blight). The natural disaster cover on the other hand, is limited to losses caused by natural calamities, which includes typhoons, floods, drought, earthquakes and volcanic eruption.

The insurance premium rate varies per season, risk classification and amount of subsidy received from lending institutions and government. All borrowing individual farmers and groups are eligible for crop insurance if they have obtained production loans from lending institutions that are participants of either rice production programs implemented by the government or credit programs sponsored by Government Owned and Controlled Corporations (GOCCs)/Government Financial Institutions (GFIs)/Non-Government

Organizations (NGOs)/Department of Interior and Local Government (DILG)-Local Government Units (LGUs). Self-financed farmers/farmer groups' eligibility for crop insurance is dependent on their willingness to be subjected to the technical supervision of the agricultural production technician accredited by the PCIC. Lastly, all Farmer Organization (FO) or People's Organization (PO) or group of farmers are qualified as specified under the Government Corporation Insurance System (GCIS).

Farms are also screened for insurance coverage. The eligibility criteria include presence of effective irrigation and drainage systems, accessibility to regular means of transportation, production suitability specified by the recommended package of technology and located in an area with stable peace and order situation and where there are no threats to health. Moreover, the farm should not be a portion of riverbed, lakebed, marshland, shoreline or riverbank. Rainfed farms are qualified but only during wet season.

The PCIC require several documents for rice insurance application. These requirements vary for individuals and groups. The requirements common to all, are the Farm Plan and Budget (FPB), which must provide details on the inputs used and the schedule of farm activities; and the Location Sketch Plan (LSP)/Control Map (CM) which should specify landmarks and names of adjacent lots owners.

Farmers or farmer groups may lodge their insurance applications at the lending institutions where they acquired loans, at the PCIC regional offices or with PCIC authorized underwriters. Applications may be filed on any day prior to the planting date until 15 days thereafter.

If loss caused by perils covered by the insurance is experienced, the

farmer should file a written Notice of Loss (NL) to the PCIC regional office within ten days following the damage occurrence and prior to the expected date of harvest. For losses that are slow occurring and full magnitude is not known immediately, oftentimes arising from pest infestation, disease or drought, the NL should be submitted as soon as the damage is discovered. Filing of NL should also not be later than 20 days before the harvest schedule. The most important information provided on the NL are the name of the farmer with crop insurance, CIC and lot number; time when the loss occurred; stage of cultivation; nature, cause and extent of loss. The farmer or an immediate family member may claim for indemnity by filling out the PCIC Indemnity Form and submit this to the regional or satellite office within 45 days following the loss.

Before claims are paid, the PCIC conducts verification and assessment of insured farms with damaged crops. A two-person team of adjuster, from PCIC and the DILG/DA/NIA, visits farms to validate notices of loss (NL). Losses are categorized either as total, partial or no loss. Total loss means the damage is 90 percent and above; partial loss means damage of more than 10 percent but below 90 percent of damage; and no loss if damage is just 10 percent and below. The bases for determining the amount of indemnity paid to the farmer are the stage of cultivation when the loss occurred; actual cost of production input (CPI) indicated on the farm plan and budget (FPB); and percentage of yield loss. To facilitate fast payment of claims, PCIC sets the settlement period to a maximum of 60 calendar days from the filing of claims. Claims are deemed approved by PCIC when not acted upon within 60 days.

The other benefits bundled with rice insurance are term insurance and rebate. Rice insurance comes with a death benefit rider amounting to

Php10,000 for every farmer below 75 years old that dies within the period of coverage. Another benefit is the 10 percent premium rebate, entitled to farmers with crop insurance who were not able to file indemnity claim for three consecutive seasons.

Aside from its regular insurance, PCIC also have special programs that offers rice insurance for free to eligible farmers and farmer groups. Under the regular program, farmers pay 45 percent share of the premium and the government shoulders the remaining 55 percent. In the special programs, farmers enjoy 100 percent subsidy. Currently, PCIC is implementing four special crop insurance programs, one of these is the Weather Adverse Rice Areas (WARA). The main target beneficiaries of WARA are farmers located in areas most vulnerable to climate change with the objective of providing cover for crop losses arising from weather variability and adverse changes in climate. WARA is jointly implemented with the Department of Agriculture.

Another special program is Sikat Saka, a rice insurance program tied with credit. Sikat Saka is carried out with the Department of Agriculture and Land Bank of the Philippines (LBP). It serves as the credit facility of the Food Staples Sufficiency Program of the DA. The amount of cover per hectare can be as high as the loan extended by Land Bank but not to exceed the maximum cover set by PCIC.

The Department of Agrarian reform in partnership with DA, LandBank of the Philippines and PCIC also provides free crop insurance under the Agrarian Production Credit Program and Credit Assistance Program for Program Beneficiaries Development (APCP-CAP-PBD). The APCP-CAP-PBD is intended as a low cost credit-financing scheme, market support and

development assistance for agrarian reform beneficiaries (ARBs) and their family members. This is also categorized under the special insurance programs of PCIC.

Similar to the other special programs of PCIC, the Registry System for Basic Sectors in Agriculture – Agricultural Insurance Program (RSBSA-AIP) also provides fully subsidized crop insurance for subsistence farmers included in the RBSA list. The special insurance program is being financed by the national government.

In 2014, the PCIC implemented a temporary special insurance program that gave free crop insurance to help farmers and fishers affected by typhoon Yolanda. The regions that benefitted were regions 6, 7 and 8. The Yolanda special program lasted only until 2015.

The PCIC also partners with local government units to provide crop insurance. In Western Visayas, only Capiz and Negros Occidental had specific programs that provided free or subsidized crop insurance for selected farmer beneficiaries. Capiz has the Viable Insurance for Capiz (VIC) Farmers. This PCIC partnership and Capiz Provincial government partnership started in April 14, 2012, aimed at providing 5,000 rice farmers covering 5,000 hectares of rice farmland. The program included 16 municipalities of Capiz and its capital, Roxas city. The program is a multi-risk rice crop insurance that covers Php10,000 to Php15,000 of losses. The crop insurance also includes accident and dismemberment riders with Php 50,000 coverage.

The same partnership was fostered by PCIC with the provincial government of Negros Occidental in 2011. The program in Negros Occidental was the Negros First Universal Crop Insurance Program (NFUCIP). The initial

target was to provide crop insurance subsidy to 10,000 farmers. Out of the P840 premium amount, Php500 will be shouldered by NFUCIP and the remaining amount of Php340 will be paid by the farmer. The 500 pesos is actually a premium payment loan to be repaid by the farmer after harvest season. The program covers only farmers not included by the RSBSA program of PCIC. The purpose of NFUCIP is to make crop insurance more accessible to small farm holders that did not benefit from the special programs of PCIC.

Locale of the Study

This research was conducted in Western Visayas, one of the top producers of rice in the country. It includes six provinces – Aklan, Antique, Capiz, Iloilo, Guimaras and Negros Occidental (see Figure 1). The study covered all six provinces and 72 municipalities.

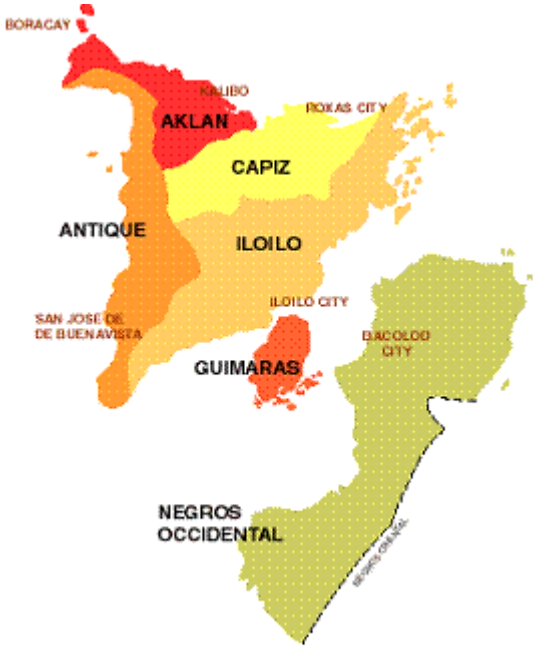


Figure 1. Map of Western Visayas (Source: http://nap.psa.gov.ph)

Climate in Western Visayas is predominantly Type 1, which is dry from November to April and wet for rest of the year (PAGASA,

http://pagasa.dost.gov.ph/index.php/climate-of-the-philippines). The region has 16 cities and 117 municipalities. Its total population is at 7.1 million as of the 2010 census and growing annually at rate of 1.35 percent.

Western Visayas' gross domestic product (GDP) in 2013 reached Php 270.56 billion, about four percent of the national GDP. Poverty incidence is 22.8 percent, slightly lower compared to the national average of 25.2 percent. Agriculture is one of the major economic drivers of region 6, contributing 36.8 percent and 23.5 percent to regional employment and output respectively. The total land area devoted to agricultural production is 666,917 hectares.

Rice is the most important agricultural commodity of the region. It accounts for one-fourth (24.87 percent) of the total regional value added in agriculture and about 11-13 percent of the total national production. Rice production in Western Visayas has been quite erratic for the last six years since 2010. The total rice output was 1.7 million metric tons in 2010, this increased to 2.92 million mt in 2012 but declined in 2013 to 2.09 million mt. Production declined further in 2014 to 2.052 million mt and slightly increased to 2.056 million mt in 2015. The major causes of these declines are mostly extreme weather events such as strong typhoon, heavy rains or El Nino.

Iloilo province is the biggest producer of palay among the six provinces of region 6, contributing 37-43 percent of the regional palay output. Negros Occidental comes second and contributes about 21-24 percent. The third biggest rice producer is Capiz, with an output equivalent to 14-19 percent of the region's total rice output.

Table 1: Volume and Percent distribution of Palay Production by Province in Western Visayas from 2010-2015.

Location	2010	%	2011	%	2012	%	2013	%	2014	%	2015	%
Aklan	103,625	6	126,657	6	129,645	6	135,293	6	104,712	5	106,329	5
Antique	211,466	12	287,036	13	273,468	12	286,622	14	280,084	14	285,203	14
Capiz	335,608	19	349,094	16	360,914	16	322,388	15	291,158	14	256,823	12
Guimaras	42,716	2	51,413	2	55,425	2	46,066	2	51,202	2	40,154	2
Iloilo	659,970	37	959,239	43	995,402	43	822,452	39	846,636	41	877,076	43
Negros Occidental	436,308	24	471,599	21	477,347	21	477,969	23	478,782	23	491,239	24
Total	**1,789,693**	**100**	**2,245,038**	**100**	**2,292,201**	**100**	**2,090,790**	**100**	**2,052,574**	**100**	**2,056,824**	**100**

Rice farm gate prices in Western Visayas is also not stable. For the three year period from 2013 to 2015, average farm gate prices per kilogram were Php15.36, Php 18.65 and Php16.70 respectively. The average net return per hectare per annum from 2013-2015 are Php7,897; P22,852 and Php17,670.

Rice Farming in Western Visayas

Rice farming in the Western Visayas lasts for three to four months. There are two cropping cycles for one year, depending on water availability. Farms with access to regular irrigation however, can have as much as three cropping periods. The first cropping period falls during the rainy season. Planting or sowing commences either in May or June while harvest starts from September or October. The second cropping period falls during the dry season. The production cycle starts in either October or November lasting until January or February.

More than half of the farms in Region 6 are rainfed. The total area devoted to rice from 2013 to 2015 is about 619,105 hectares on average but only 48 percent is irrigated and the remaining 52 percent is rain fed. Moreover,

"*the irrigation systems of the National Irrigation Administration are mostly run-off the river type, which make the 35% to 45% irrigated rice areas similar to rain fed conditions during the dry cropping season"* (PhilRice Negros, 2012).

Table 2: Physical Area and Percent Distribution of Farms Devoted to Rice by Irrigation Type in Western Visayas from 2013-2015.

Irrigation Type	2013		2014		2015	
	Area (ha)	%	Area (ha)	%	Area (ha)	%
Irrigated	288,187	47	296,174	48	304,733	49
Rainfed	328,086	53	322,553	52	317,582	51
Total	**616,273**	**100**	**618,727**	**100**	**622,315**	**100**

Rice planting methods vary depending on water availability. Some farmers use transplanting technique while others are into direct seeding which can be done by broadcast, drilling or by dibbling. Direct seeding requires fewer labor and places less stress on the plant compared to transplanting. The disadvantages however include exposure of seeds to pests such as birds and snails, more seed requirement and greater crop-weed competition.

Most farmers in Region 6 plant only one crop on their field. This is also true for rice farms in Western Visayas. Mono-cropping is the most common cropping system. The more enterprising farmers however, are into intercropping or growing other crops simultaneously or interchangeably with rice after it is harvested. The most common crops planted with rice are mungbean and watermelon. Watermelon is usually planted after rice is harvested.

Rice farmers in Western Visayas use inbred varieties. Only a few use hybrid variety. This is due to the higher cost of hybrid seeds compared to inbred seeds. Another reason is attitude towards new technology. Farmers do not

easily take on new technology, they tend to stick to the one that they are accustomed to.

Inorganic fertilizers such as Urea, Complete (14-14-14), Ammosul and Ammopho, are still the most commonly used fertilizers for rice farms in the region. The average usage of Urea and Complete for the period of five years from 2010 to 2014 are 87.2 kgs/hectare and 68.5 kgs/hectare respectively. Usage of Ammosul at 35.9 kg/ha and Ammopho at 28.8 kg/ha was much lesser during the same period.

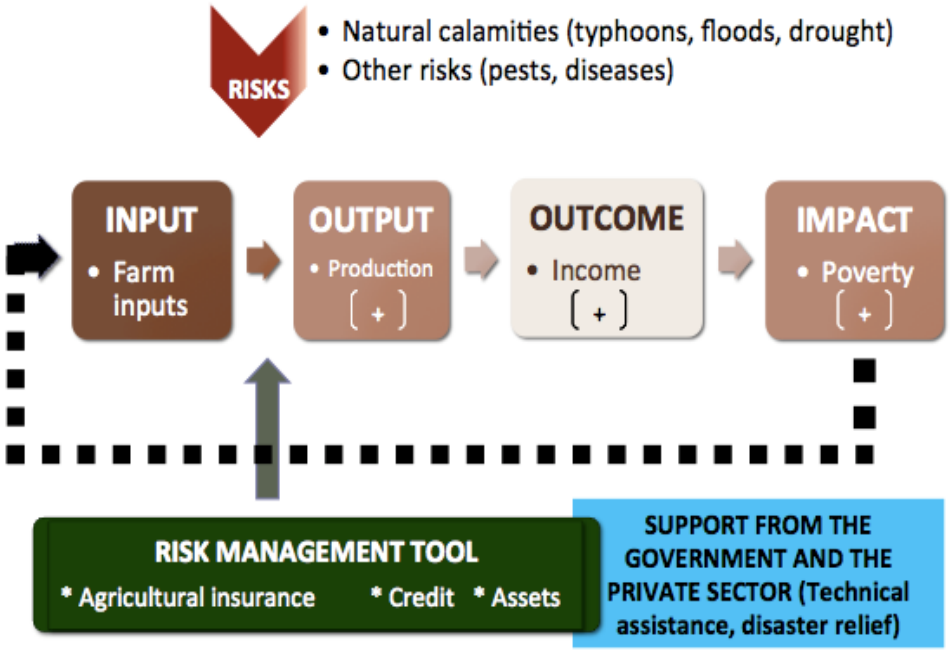
Labor utilization depends on the size of the farm. Smaller farms of less than a hectare are usually tilled by their owner and use only unpaid family labor. Farm work are oftentimes done manually or with an aid of a carabao/cow for plowing. Labor, if ever hired, is paid either on a daily per piecework basis or through pakyaw system or contract labor arrangement. Under the pakyaw system, labor is paid depending on the contract price agreement, the prevailing rate in the barangay is usually being followed. Contract labor is hired to either do a portion of the farming process such as land preparation; or the whole production process from land preparation to harvesting. Farmers involved in doing all the farm work are shareworkers, who serve as the farm's regular laborers and are paid by the percentage share of the harvest.

Chapter 2: Framework

Insurance as a Risk Management Tool

In a disaster prone country like the Philippines, rice farmers face a lot of hazards brought about by extreme weather events, pests and crop diseases. All these pose threats to production, income and food security that renders small-scale farming households highly vulnerable. This is true for Western Visayas when Typhoon Yolanda struck the region in 2013. Farmers and fishers were among the hardest hit. Most of them had difficulty recovering from the calamity due to lack of sufficient safety nets.

Crop insurance can serve as a buffer following major disasters such as typhoon Yolanda. In countries like China and Vietnam, crop insurance have played a major role in maintaining food and livelihood security among farmers, fishers and aquaculture operators.



Source: PIDS presentation

Figure 2. Role of Insurance

The diagram above shows the role of crop insurance as a risk management tool. Its purpose is to manage perils intrinsic in agricultural production, stabilize farmers' finances and enhance their access to credit. Crop insurance therefore is viewed as an important solution to lessen farmers' vulnerability by providing protection from risks. It can serve as safety net when disasters strike by smoothing income and consumption. With insurance, the negative impacts from crop damages are reduced and farmers are able continue farming and recover faster from damage. Moreover, potential benefits from insurance can even extend beyond risk protection. It can increase farmers' access to formal credit; promote good agricultural practices and encourage investment in more productive farming technologies.

Theory of Change

The impacts of crop insurance on farmers' well-being is best illustrated by the theory of change developed for this project.

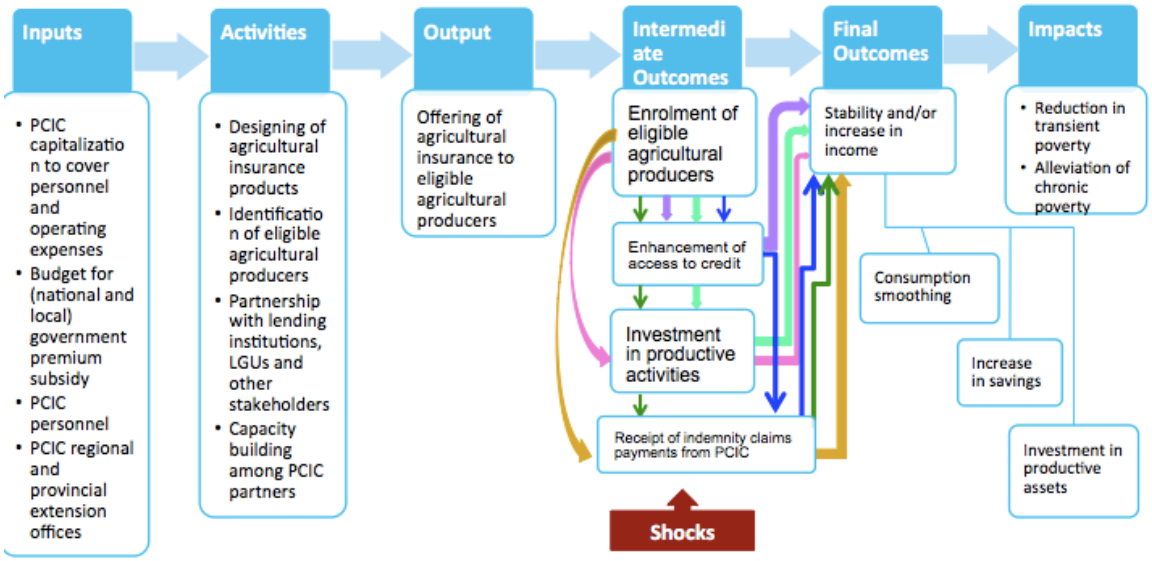


Figure 3. Theory of change

The theory of change shown by the figure above provides details on the impacts of crop insurance on farmers. The inputs for the intervention are PCIC capitalization for personnel salaries and operating expenses, national and local government budgetary allocations for premium subsidy, services of PCIC personnel and PCIC regional and extension offices. The activities include designing of insurance products, identifying eligible farmers for insurance, fostering partnerships with formal credit institutions, LGUs and other stakeholders and building capacities of PCIC partners. The primary output is the offering of crop insurance to qualified farmers. These cause intermediate outcomes of enrolment of qualified farmers to insurance, enhanced access to credit, investment in productive activities and receipt of indemnity claims from PCIC when shocks occur. The final outcome is stabilized income leading to smoothened consumption, increased savings and investment in productive assets. The intermediate and final outcomes are eventually translated into positive impacts of reducing transient and chronic poverty among farmers. Based on this theory of change, this study aims to determine whether these impacts are indeed realized with crop insurance.

Objective

This study is anchored on the theory of change explained above. The aim of this study is to assess the impact of crop insurance on rice farmers' well being in Western Visayas particularly on their net income from rice farming.

Chapter 3: Methodology

The research follows a quasi-experimental design to evaluate the impacts of crop insurance program on rice farmers. Unlike, randomized controlled trials (RCTs), quasi-experiments lack random assignment (UNICEF, 2014). Quasi - experiments are appropriate for projects that were already implemented like the crop insurance program of the PCIC.

The period covered by the study is two years, from October 2013 to October 2015. The eligible population consists of rice farmers included in the Registry System for Basic Sectors in Agriculture (RSBSA) list and were located in areas where there were indemnity claims.

The power calculation resulted to 500 rice-farming households required for impact evaluation for each region. The actual number of respondents for Western Visayas is 506. Extra treatment and control samples were identified to give allowance in cases of refusals and non-response. The respondents were randomly drawn from the list of farmers provided by the PCIC based on the Registry System for Basic Sectors in Agriculture (RSBSA). Further, 500 sample size was proportionately allocated among the strata with treatment groups and farm size categories as stratification variables

Table 3: Frequency Distribution of respondents by treatment group.

Treatment Group	Number of Respondents
Treatment 1: Rice farmers with crop insurance and received indemnity claims payment from the PCIC during the reference period (Oct. 2013-Sep. 2015)	125
Treatment 2: Rice farmers with crop insurance but did not receive indemnity claims payment from the PCIC, and were located in areas where there were claims during the reference period	128
Comparison Group: Rice farmers who did not avail of crop insurance but with similar characteristics as those of treatment samples	253
Total	**506**

Control samples were identified based on five (or at least 3) critical matching variables, namely: area devoted to rice, farm location, ARB status, access to irrigation, and farm tenure status.

Data were gathered through a survey that made use of a questionnaire administered using a tablet computer. The instrument included questions pertaining to respondent/household information, housing, household and assets, access to physical infrastructure, economic support and agricultural services, farm characteristics, production and farm income, credit availment practices, income and other receipts, shocks and coping, risk mitigation strategies in crop production, utilization of indemnity claim payment, and willingness to pay for rice insurance. The data were analyzed using probit regression, random effects panel regression and t-tests.

Chapter 4: Results

Profile of Rice Farmers and Household

The rice farmers included in the study were mostly married males (87 percent) and generally advanced in years, aged fifty years and above. Almost all are literate with 99 percent having at least primary education; which makes only about four out of the 506 not having any formal schooling. Moreover, one-third or 33 percent either reached or graduated college. Farming experience on the other hand, varies from one year to 79 years but majority are experienced farmers who are into farming for more than 20 years.

Table 4. Profile of Farmers by Treatment Group

	With Insurance, with claims	With insurance, without claims	Without insurance	Total
Age (years)	54	53	54	54
HH Size	4.5	4.6	4.4	4.5
Sex (percent)				
Male	85.6	88.3	86.2	86.6
Female	14.4	11.7	13.8	13.4
Education (percent)				
No grade Completed	1.6	0.8	0.4	0.8
Primary	39.2	43.8	45.1	43.3
Secondary	22.4	16.4	26.5	22.9
Post-secondary/Tertiary	36.8	39.1	28.1	33.0
Civil Status (percent)				
Single	8.8	5.5	9.1	8.1
Married	82.4	86.7	75.5	80.0
Widowed	7.2	6.3	11.5	9.1
Divorced/Separated			0.4	0.2
Common Law/Live-in	1.6	0.8	3.6	2.4
Unknown/No answer		0.8		0.2
Average Years in Farming	27	25	26	26

The farming households included in the research, have an average size of 4.5 members, which is almost the same as the national average of 4.6 Of the 506 farmers respondents, only 257 (50.8 percent) are members of farmer's organization, most of whom availed agricultural insurance. As presented in the table below, only few farmers are members of cooperatives (3.0 percent) and most are members of farmer's organizations (43.7 percent). Many farmers' cooperatives have been established in the municipalities of the region but most of these were not sustained due to financial problems.

Table 5: Percentage Distribution of Farmers, by type of organization and treatment group, 2014-2015

	With Insurance, with claims (n=125)	**With insurance, without claims (n=128)**	**Without insurance (n=253)**	**Total (n=506)**
Farmer's Association	52.0	56.3	33.2	43.7
Cooperative	4.8	5.5	0.8	3.0
Senior Citizens Organization	0.0	1.6	4.0	2.4
Agrarian Reform Beneficiary Organization	0.8	2.3	0.4	1.0
Others	0.8	0.8	0.8	0.8
Total	58.4	66.4	39.1	50.8

Household assets are indicators of lifestyle and provide a picture of a household's standard of living. Compared to the other two groups, a bigger percentage of farmers belonging to T1 or those with insurance and with claims own more high value household assets such as motorcycle, refrigerator, washing machine and personal computer compared to the other two group of farmers. In almost all type of household assets in the list, T1 farmers have higher ownership percentage compared to the other two groups of farmers.

Table 6. Percentage Distribution of Households by Type of Household Asset

	With Insurance, with claims (n=125)	With insurance, without claims (n=128)	Without insurance (n=253)	Total (n=506)
Car	4.8	3.1	4.0	4.0
Motorcycle	43.2	27.3	37.9	36.6
Airconditioning Unit	4.8	1.6	2.4	2.8
Washing Machine	13.6	11.7	7.9	10.3
Stove	16.8	4.7	11.9	11.3
Refrigerator	46.4	32.0	37.2	38.1
Personal Computer	8.0	4.7	6.3	6.3
Cellular Phone	89.6	87.5	84.6	86.6
Audio Component	8.8	9.4	8.7	8.9
Karaoke/Videoke Machine	4.0	3.9	4.0	4.0
DVD/CD/VCD Player	24.8	29.7	31.2	29.2
Television	84.8	81.3	79.1	81.0
Radio/Cassette Player	51.2	48.4	44.3	47.0

Farm assets consist of equipment, machines, tools and facilities used in crop production and harvesting. The same trend is observed as with household assets, the group of farmers with crop insurance and has received indemnity payments had more farms assets compared to the other respondent groups. These assets are also of high value such as hand tractor, thresher, storage facility and pump and are not easily affordable. This indicates that more T1 farmers are able to afford such equipment compared to the other farmers in the study.

Table 7. Percentage of Households by Type of Farm Asset

	With Insurance, with claims (n=125)	With insurance, without claims (n=128)	Without insurance (n=253)	Total (n=506)
4-wheel Tractor	1.6	0.0	0.4	0.6
Hand Tractor	32.8	16.4	24.5	24.5
Truck	0.8	1.6	1.2	1.2
Thresher	15.2	6.3	12.6	11.7
Plow	32.8	30.5	26.5	29.1
Storage/Bodega	4.0	1.6	3.6	3.2
Jetmatic Pump	18.4	12.5	13.8	14.6
Cart	4.0	5.5	4.7	4.7

Sources of Income

The rice farming households included in the study have at least 15 sources of income. The sources that contribute more to total household income are rice production, employment, local and international remittances, wholesale and retail trade. Rice production added about 7 – 14 percent to household income during the reference period. Wholesale and retail trade contributed the highest portion of income, from 15 – 47 percent. Wholesale and retail trade includes sari-sari store operation and other businesses.

Income from rice production declined in 2015 across all treatment groups. This is not only for rice crop production but for almost all income sources. For treatment 1 farmers, the decline in rice production, remittances, pension and retail trade were compensated by income from fishing. Among Treatment 2 farmers, livestock and community and social and recreational income increased to cover for the decreases in income from rice farming, salaries and wages and remittances. For farmers without insurance, the decrease in rice farming, salaries and wages were offset by increases in, income from livestock and poultry and transportation.

Table 8: Percent Distribution of Income by Source by Treatment Group

Sources of Income	With Insurance, with claims (n=125)		With insurance, without claims (n=128)		Without insurance (n=253)	
	2014	2015	2014	2015	2014	2015
Rice Production	12.36	7.76	9.61	7.31	13.85	11.80
Salaries and Wages from Employment	17.83	9.95	25.14	18.20	20.63	18.69
Received net share	0.85	0.43	1.66	1.24	2.48	2.29
Family sustenance activity	4.69	3.48	1.23	0.92	2.64	3.46
From abroad	9.95	5.26	10.79	6.96	13.82	11.49
From domestic sources	1.67	1.92	3.69	4.24	2.39	3.57
Rentals	0.00	0.00	0.00	0.00	4.71	4.22
Pension	4.53	2.54	5.94	2.89	12.66	11.33
Livestock and poultry raising	0.74	1.44	0.97	9.38	4.61	10.89
Fishing	0.03	40.50	0.00	0.00	0.00	0.00
Forestry and hunting	0.00	0.00	0.00	0.00	0.94	0.70
Wholesale and retail trade	47.35	23.31	33.89	25.27	17.31	15.50
Community, Social, Recreational and Personal	0.00	0.00	0.00	18.31	0.00	0.00
Transportation, Storage and communication	0.00	3.42	7.07	5.27	0.00	2.53
Other Receipts	0.00	0.00	0.00	0.00	3.96	3.54
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Farm Characteristics

The number of land parcels that farmer respondents cultivate for rice generally does not exceed one. Majority (88 percent) of them have only one parcel, a few (10 percent) have two and only one have five. The physical area planted with rice differed among the three groups of respondents. Farmers with insurance and received indemnity claims devoted bigger land area to rice at an average of 1.3 hectares compared to the 0.73 and 0.9 hectare allotted by the two other groups, those with insurance without claims and those without insurance respectively.

While farm sizes devoted to rice were different in the three treatment groups, cropping system is not. An overwhelming majority (92 percent) did not plant any other crop aside from rice. Only eight percent of the respondents practiced intercropping. This result implies that most rice farmer respondents are not into crop diversification because it entails additional knowledge of farming techniques of other crops. Intercropping also requires more capital outlay because it is a different production process with different inputs and labor needs.

The most common land tenure for the sample rice farms is full ownership followed by tenanted and leased/rented. About 42-50 percent of the farmers across the three groups of respondents fully own the farm lots that they cultivate, about 19-26 percent are tenants or shareholders, about the same percentage (20-24 percent) are leaseholders. The other types of tenure status are holders of certificates of land ownership awards (CLOA) or similar arrangements.

Table 9. Characteristics of Farms by Treatment Group

	With Insurance, with claims	**With insurance, without claims**	**Without insurance**	**Total**
Average Number of Parcels Planted	1.2	1.15	1.14	1.16
Average Physical Area Planted (*ha*)	1.3	0.73	0.97	0.99
Cropping System (percent)				
Monocropping	92.7	92.6	91.7	92.2
Intercropping	7.3	7.4	7.6	7.5
Both			0.7	0.3
Tenurial Status by Farm Parcel (%)				
Fully Owned	45.3	50.0	42.4	45.1
Tenanted	22.7	18.9	26.0	23.4
Rented/Leased	20.0	23.6	22.9	22.4
Held under CLOA	4.0	4.1	2.8	3.4
Owner-like possession on other than CLT/CLOA	2.0	0.7	0.7	1.0
Others	6.0	2.7	5.2	4.8

Hybrid rice was not popular for cultivation among respondent farmers. Based on the table below, 90-95 percent of them across all treatment groups did not use hybrid rice as planting material during the two-year research period. Despite the promise of higher returns of hybrid rice, farmers still plant the inbred varieties that they are used to. Age is one of the reasons for the low adoption of hybrid rice. Since most farmers are relatively older, they are less accepting of newer technologies such as hybrid rice varieties.

Agricultural technicians have been complaining that farmers do not easily take on new technology despite the provision of training and information campaign through various IEC materials. Farmers will try the new varieties for some time but eventually go back to the inbred varieties that they have been using. The cost of seeds is a consideration. When the new variety is introduced the government usually provides temporary subsidy, after the subsidy is removed, farmers have to contend with the higher cost of hybrid seeds.

Table 10. Percentage Distribution of Parcels by Major Crop, by Treatment Group, 2014-2015

	With Insurance, with claims	With insurance, without claims	Without insurance	Total
2014 (percent)				
Hybrid Variety	9	5	6	7
Non-hybrid Variety	91	95	94	93
2015 (percent)				
Hybrid Variety	10	10	8	9
Non-hybrid Variety	90	90	92	91

Rice production and post-harvest facilities, including credit and financial institutions are important for efficient and sustainable rice farming. Most farmers do not own or have no access to most of these much needed

equipment and facilities but some are available in the barangay. Awareness among farmers is important, so that availment is possible when the need arises.

Among the facilities that at least 30 percent of the farmers across treatment groups are aware of are related to rice production and harvesting, such as sun drying pavement, thresher and rice mill. These facilities are widely available and well-known in the community because of high demand. Threshers and rice mills for example are common post-harvest facilities that all farmers must be aware of because these are necessary after harvesting rice. Rice threshing and milling services are widely available in most rice farming barangays in the region.

Many farmers are also aware of agriculture enterprises and cooperatives existing in their barangay. This reflects again that their awareness of facilities depends on their need for these facilities. Agriculture enterprises and credit institutions, which includes seller of inputs and sources of credit are well-known among farmers because these are the sources of farming inputs and microfinancing needs. Awareness of cooperatives is also high because either they are part or were invited to be member of the organization. Moreover, since cooperatives are supported by the local government, farmers must have received numerous information about these in trainings and meetings initiated by the municipal agriculture office.

Table 11. Percentage of Households by Type Awareness of Existence of Facilities in the Barangay

	With Insurance, with claims (n=125)	With insurance, without claims (n=128)	Without insurance (n=253)	Total (n=506)
Traditional sun-drying pavement	51.2	48.4	45.8	47.8
Flatbed dryer	14.4	6.3	7.5	8.9
Mechanical dryer	8.0	10.9	9.5	9.5
Other dryer	4.0	3.1	1.2	2.4
Thresher	66.4	62.5	60.5	62.5
Harvester-thresher	7.2	9.4	7.9	8.1
Sheller	6.4	5.5	5.5	5.7
Corn sheller	0.8	0.8	0.8	0.8
Single pass rice mill	32.8	34.4	26.1	29.8
Multi pass rice mill	8.0	4.7	3.2	4.7
In-house storage	15.2	9.4	9.1	9.9
Communal storage	2.4	3.1	2.4	2.6
Government warehouse	4.0	2.3	3.6	3.4
Private commercial warehouse	4.8	3.9	4.3	4.3
Agricultural produce market	16.8	25.8	18.6	20.0
Fertilizer dealer	16.8	23.4	17.8	19.0
Pesticide dealer	17.6	23.4	17.8	19.2
Seeds dealer	16.8	21.9	17.0	18.2
Feeds dealer	13.6	21.1	15.0	16.2
Agriculture & enterprise development/training	45.6	44.5	39.1	42.1
Banks	7.2	16.4	10.3	11.1
Cooperatives	36.0	36.7	30.0	33.2
Microfinance institutions	20.0	18.8	15.4	17.4
Credit institutions	6.4	12.5	7.1	8.3

Awareness of Agricultural Insurance

The survey also gathered data on the knowledge and attitude of the rice farmers toward agricultural insurance. Those who did not avail crop insurance are either not aware of crop insurance or not aware of the ways to avail of insurance.

Table 12 . Distribution of Farmers by Reason of Non-availment of Agricultural Insurance

Reason of Non-availment of Agricultural Insurance	Frequency the reason was reported	percent to total farmers (n=253)
Not aware of crop insurance	114	45.1
Not aware of ways one can avail of insurance	82	32.4
No need of insurance	23	9.1
Lack capacity to pay for the premium	17	6.7
Do not trust the institution offering agricultural insurance	8	3.2
Not satisfied with the amount of cover with respect to premium price	6	2.4
Heard that claims payment takes too long	5	2.0
The documentary requirements are difficult to comply	2	0.8
Not required by my credit institution	1	0.4
Others	66	26.1

The agricultural technician of the local government unit was cited by 47 percent of farmers with insurance as the reason for availment. Rice farmers were convinced by the explanations of the agricultural technician about the benefits of crop insurance. This highlights the importance of the role played by the extension workers in encouraging farmers to have their crop insured.

Some farmers on the other hand, availed of crop insurance only because it was a requirement when they apply for a loan in a cooperative, bank, or lending institution. This scheme of bundling crop insurance with agricultural loan is one of the special programs of PCIC and DA that fully subsidize crop insurance.

Table 13 . Distribution of Rice Farmers by Reason of Availment of Agricultural Insurance

Reason of Availment of Agricultural Insurance	With insurance, with claims (n=125)		With insurance, without claims (n=128)	
	Freq	percent	Freq	percent
The agricultural technician in our LGU	63	50.4	56	43.8
Beneficiary of free insurance program of the government	7	5.6	8	6.3
Requirement for me to get a loan in my cooperative/lending institution/bank	7	5.6	3	2.3
My neighbor/friend/relative was able to claim and encouraged me	7	5.6	4	3.1
Saw an advertisement or television program on agricultural insurance	1	0.8	0	0.0
Others	20	16	7	5.5

Majority (42 percent) of the rice farmers whose farms had crop insurance from 2014 to 2015, paid the premium from their own pocket. These are the paying farmers under the regular crop insurance program of the PCIC. The beneficiaries of the special programs are about 28 percent. These rice farmers were recipients of free crop insurance from either Sikat Saka Program, WARA, RSBSA or APCP-CAP-PBD.

Table 14. Distribution of Rice Farmers by Source of Premium Payment of Agricultural Insurance and Treatment Group

Source of Premium Payment	With insurance, with claims (n=125)		With insurance, without claims (n=128)	
	Freq	percent	Freq	percent
Out of pocket	62	49.6	46	35.9
Free insurance from government program	41	32.8	30	23.4
Part of the loan from creditor	3	2.4	1	0.8
Borrowed from relative/friend/neighbor			1	0.8

Out of the 125 rice farmers with crop insurance and received indemnity claims in 2014 or 2015, 86% or 107 consistently insure their farms. Similarly, majority (65 percent) of farmers with crop insurance but without claims have been getting crop insurance on a regular basis. While farmers who did not have crop insurance mostly lacked awareness of where and how to apply for crop insurance. Some of them however, decided not to avail of crop insurance either due to insufficient funds to pay for the premium or because of negative perception about crop insurance. Others did not get insurance regularly because they fail to beat the application deadline.

Table 15. Percentage Distribution of Farmers by Reason for Not Availing Agricultural Insurance Regularly and Treatment Group

	With Insurance, with claims (n=125)	**With insurance, without claims (n=128)**	**Total (n=253)**
I do not have enough money to pay for it	2.4	0.8	1.6
I do not think insurance is helpful to my farming activities	0.8	0.0	0.4
I did not reach the deadline for applying this cropping season	0.0	9.4	4.7
I do not know how to avail of agricultural insurance (where to apply, etc.)	2.4	10.2	6.3
A relative/friend/neighbor told me that they had difficulty getting indemnity claims	0.0	0.8	0.4
Others	8.8	14.1	11.5
Total	**14.4**	**35.2**	**24.9**

The average amount of rice insurance cover per hectare of the respondents were PhP18,430 and PhP18,739 for 2014 and 2015, respectively. The average amount of insurance cover for farmers without indemnity payment claims is higher compared with the farmers with claims. Rice farmers with

smaller farms on the other hand, have the highest per hectare insurance cover in both years.

Table 16. Average amount of insurance cover per hectare (PHP) by treatment group and farm size, 2014-2015

Farm Size	2014			2015		
	With Claims	Without Claims	All	With Claims	Without Claims	All
0.5 ha & below	22,414	22,020	22,115	18,085	24,881	22,368
> 0.5 ha to 1.0 ha	14,866	20,494	17,477	17,536	19,434	18,537
> 1.0 ha	17,597	15,866	17,241	17,186	12,745	16,289
All farm sizes	17,090	20,221	18,430	17,455	20,376	18,739

Availment of Crop Insurance

The rice farmers in this study did not have insurance coverage for the whole duration of the research. Some of them have crop insurance for one planting season only. This is evident in the percentage of insurance cover shown by Table 5, which shows that some farmers did not have insurance in either 2014 or 2015. What is notable however is that the percentage of insurance coverage among of those with claims (81 percent for the two periods) is much higher compared to those without claims (64 percent for two periods). This means that farmers who received indemnity payments were availing of crop insurance more regularly compared to those who did not receive claims.

Table 17. Percentage Distribution of Parcels Covered by Crop Insurance, by Treatment Group, 2014-2015.

	With Insurance, with claims	With insurance, without claims
2014		
Not Covered	22	40
Covered	78	60
2015		
Not Covered	16	32
Covered	84	68

Agricultural insurance sponsored bv the local government unit was the type of insurance program that most farmers availed of. The distribution of farmers by type of program is presented below. For both years, majority reported that they are recipients of free agricultural insurance program supported by the local government unit (LGU). However, it is possible that farmers incorrectly reported the type of government program because all the free agricultural insurance programs are facilitated by the agricultural technician of the LGU. It must be noted that only few farmers did not know the type of agricultural insurance program that they availed.

Table 18. Percent Distribution of Parcels Covered with Agricultural Insurance by Type of Program, 2014-2015

	With Insurance, with claims	With insurance, without claims	All
2014	**(n=113)**	**(n=104)**	**(n=217)**
DA Sikat Saka	23.0	14.4	18.9
DA WARA	4.4	3.8	4.1
DAR	13.3	11.5	12.4
LGU	30.1	45.2	37.3
NIA Third Cropping	3.5	0.0	1.8
RSBSA	21.2	23.1	22.1
2015	**(n=124)**	**(n=120)**	**(n=244)**
DA Sikat Saka	18.5	9.2	13.9
DA WARA	8.9	5.8	7.4
DAR	11.3	15.8	13.5
LGU	31.5	32.5	32.0
NIA Third Cropping	4.8	0.8	2.9
RSBSA	18.5	32.5	25.4

The rice crop insurance of PCIC covers the cost of production input as specified in the farm plan and budget and an additional amount that will not exceed 20 percent to cover the portion of the value of the expected yield. PCIC, however, set a ceiling for the amount of cover at 41,000 PHP per hectare for irrigated or rainfed parcels and 50,000 PHP for seed production.

As presented in the table below, parcels of land with insurance under the Department of Agriculture's Sikat Saka Program has the highest amount of cover on a per hectare basis. The amount of cover per hectare is higher for smaller farm sizes because rice production in smaller parcels of land entails higher cost per hectare.

Table 19: Number of Parcels with Insurance and Average Amount of Cover per hectare by treatment group, type of government program, year, and farm size, 2014-2015

	With Insurance, with claims		With insurance, without claims		Total	
	No. of Parcels with Insurance	Ave. Amount of Cover per hectare	No. of Parcels with Insurance	Ave. Amount of Cover per hectare	No. of Parcels with Insurance	Ave. Amount of Cover per hectare
DA Sikat Saka						
2014						
0.5 ha & below	2	48,500	5	32,400	7	37,000
> 0.5 ha to 1.0 ha	9	16,593	8	23,000	17	19,608
> 1.0 ha	15	26,091	2	16,667	17	24,982
2015						
0.5 ha & below	2	35,000	4	28,500	6	30,667
> 0.5 ha to 1.0 ha	8	17,125	7	21,735	15	19,276
> 1.0 ha	13	24,503			13	24,503
DA WARA						
2014						
0.5 ha & below			1	10,000	1	10,000
> 0.5 ha to 1.0 ha	2	15,000			2	15,000
> 1.0 ha	3	15,556	3	10,000	6	12,778
2015						
0.5 ha & below	3	13,333			3	13,333
> 0.5 ha to 1.0 ha	5	48,333	2	6,973	7	36,516
> 1.0 ha	3	12,222	5	10,000	8	10,833
DAR						
2014						
0.5 ha & below			7	22,857	7	22,857
> 0.5 ha to 1.0 ha	5	19,451	5	18,000	10	18,726
> 1.0 ha	10	24,271			10	24,271
2015						
0.5 ha & below	1	5,000	7	24,935	8	22,443
> 0.5 ha to 1.0 ha	6	21,167	10	19,122	16	19,889
> 1.0 ha	7	20,833	2	7,418	9	17,852

Table 19: *Continuation*

	With Insurance, with claims		With insurance, without claims		Total	
	No. of Parcels with Insurance	Ave. Amount of Cover per hectare	No. of Parcels with Insurance	Ave. Amount of Cover per hectare	No. of Parcels with Insurance	Ave. Amount of Cover per hectare
LGU						
2014						
0.5 ha & below	2	20,000	13	20,062	15	20,053
> 0.5 ha to 1.0 ha	11	9,198	24	21,118	35	17,371
> 1.0 ha	19	11,332	10	15,600	29	12,804
2015						
0.5 ha & below	5	18,000	13	27,000	18	24,500
> 0.5 ha to 1.0 ha	11	15,682	20	18,973	31	17,805
> 1.0 ha	22	12,037	7	11,810	29	11,982
NIA Third Cropping						
2014						
> 1.0 ha	4	29,100			4	29,100
2015						
> 0.5 ha to 1.0 ha			1	16,667	1	16,667
> 1.0 ha	6	28,420			6	28,420
RSBSA						
2014						
0.5 ha & below			11	22,727	11	22,727
> 0.5 ha to 1.0 ha	14	18,231	7	18,776	21	18,413
> 1.0 ha	10	14,755	6	18,976	16	16,338
2015						
0.5 ha & below	2	23,889	19	22,632	21	22,751
> 0.5 ha to 1.0 ha	11	20,303	14	18,469	25	19,276
> 1.0 ha	10	16,348	6	17,901	16	16,930
Do not know						
2014						
0.5 ha & below	10	17,680	7	18,011	17	17,816
> 0.5 ha to 1.0 ha	11	12,727	1	10,000	12	12,500
> 1.0 ha	20	13,268			20	13,268
2015						
0.5 ha & below	14	16,823	3	25,000	17	18,266
> 0.5 ha to 1.0 ha	12	14,755	4	28,795	16	18,265
> 1.0 ha	18	14,324			18	14,324
TOTAL	**306**	**17,767**	**234**	**20,303**	**540**	**18,866**

The average per hectare indemnity payment received by the sample rice farmers is presented in the table below. Indemnity payments were higher in 2014 compared with that received in 2015 by rice farmers whose farm size is half a hectare or below and one hectare or above. Farmers with small farms received the highest indemnity payment per hectare. These claims were made

mainly due to crop pest and diseases and flooding brought by typhoons or heavy rains.

Table 20. Average amount of indemnity per hectare (PHP), by farm size, 2014-2015

Farm Size	2014	2015
0.5 ha & below	14,500	8,462
> 0.5 ha to 1.0 ha	4,074	7,504
> 1.0 ha	5,988	4,300
All farm sizes	5,695	6,350

Table 21. Percent Distribution of Parcels of Land, by Cause of Loss Connected to Claim, 2014-2015

Farm Size	2014 (n=93)	2015 (n=105)
Typhoon, Flood	36.6	19.0
Drought, not enough water	7.5	16.2
Pest and Diseases	18.3	15.2
Floods not related to typhoon	0.0	1.9
Others	37.6	47.6

Indemnity claims were utilized in several ways. Majority of the farmers who reported on indemnity claim utilization, used the amount to pay for farm inputs. Some of them used the money to repay their loan and get a new one. Others used it to buy food for their family or to pay for their children's school expenses.

Table 22. Distribution of Farmers with Insurance and Claim by Utilization of Indemnity Claim

Use of Indemnity Claim	Number of Times Reported	Percent to Total Farmers (n=125)
Used to pay for farm production inputs	32	25.6
Used to pay my existing loan so that I could renew my loan	13	10.4
Used to buy food for my family	12	9.6
Used to pay for my children's educational expenses	3	2.4
Used to pay for my family's medical bills	3	2.4
Others	1	0.8

Loan Availment

The next three tables present information on loan availment of sample rice farmers in Western Visayas. For both 2014 and 2015, majority of the farmers borrowed from informal creditors, either from individual private moneylenders, relative or friend. The percent of rice farmers borrowing from formal credit such as cooperatives or banks is only 4.9 percent and 7.1 percent for 2014 and 2015, respectively. The average interest rate for 2014 is 10.0 percent and 9.2 percent for 2015. Most the farmers reported that they used the loan proceeds for rice farming-related expenses for farm production inputs or farm improvement. Others used the loaned amount for household consumption, children's education, and medical expenses.

Table 23. Distribution of Rice Farmers, by Type of Creditor (Formal/ Informal), 2014-2015

	With Insurance, with claims	With insurance, without claims	Without insurance	Total
2014				
Formal	16 (12.8%)	5 (3.9%)	4 (1.6%)	25 (4.9%)
Informal	71 (56.8%)	68 (53.1%)	130 (51.4%)	269 (53.2%)
Total	87 (69.6%)	73 (57%)	134 (53%)	
2015				
Formal	23 (18.4%)	8 (6.25%)	5 (2%)	36 (7.1%)
Informal	67 (53.6%)	83 (64.8%)	155 (61.3%)	305 (60.3%)
Total	90(72%)	91(71.1%)	200 (63.3%)	

Table 24. Percent Distribution of Rice Farmers, By Type of Creditor and Treatment Group, 2014-2015

	With Insurance, with claims	With insurance, without claims	Without insurance	Total
2014				
Cooperatives	9.6	3.1	1.2	3.8
Banks	3.2	0.8	0.4	1.2
Private Moneylenders (Institutions)	4.0	1.6	2.4	22.3
Private Moneylenders (Persons)	28.8	35.2	28.9	30.4
Relatives/Friends	24.0	16.4	20.2	20.2
2015				
Cooperatives	11.2	3.9	1.6	4.5
Banks	7.2	2.3	0.4	2.6
Private Moneylenders (Institutions)	6.4	3.9	1.6	3.4
Private Moneylenders (Persons)	28.8	43.8	37.9	37.2
Relatives/Friends	18.4	17.2	21.7	19.8

Table 25. Average interest rate of Loans Availed by Rice Farmers, 2014-2015

	With Insurance, with claims	With insurance, without claims	Without insurance	Total
2014	11.3	9.1	9.7	10.0
2015	8.3	8.1	10.4	9.2

Table 26. Percent Distribution of Rice Farmers by Utilization of Loans Availed and Treatment Group, 2014-2015

	With Insurance, with claims (n=125)	With insurance, without claims (n=128)	Without insurance (n=253)	Total (n=506)
2014				
Farm Production (Inputs)	69.6	56.3	51.4	57.1
Farm Improvements	20.8	17.2	12.6	15.8
Household Consumption	8.8	11.7	6.3	8.3
Education	2.4	3.1	0.4	1.6
Medical and Health	0.0	0.0	0.8	0.4
Others	0.0	0.0	0.4	0.2
2015				
Farm Production (Inputs)	72.0	70.3	62.1	66.6
Farm Improvements	26.4	28.1	22.5	24.9
Household Consumption	8.8	12.5	7.9	9.3
Education	0.8	3.9	0.8	1.6
Medical and Health	0.0	0.0	1.6	0.8
Others	0.8	0.0	0.4	0.4

Shocks and Coping Strategies Adopted by Farmers

The sample rice farmers reported that they experienced more natural disasters in the past two years compared to man-made disasters. Typhoon is the most severe shock often experienced by farmers for all treatment groups. Sixty-one percent of the rice farmers with insurance and 58 percent of those without insurance reported typhoon as the most severe natural disaster that they experienced in the period 2013 to 2015. Fifty-nine of sample rice farmers reported that they experienced drought.

Table 27. Percent Distribution Farmers by of Most Severe Shocks Experienced During the Past Two Years, by Treatment Group

	With Insurance, with claims (n=125)	With insurance, without claims (n=128)	Without insurance (n=253)	Total (n=506)
Natural Disaster				
Typhoon	62.4	60.9	58.9	60.3
Drought	8.8	15.6	11.1	11.7
Pest Infestation	5.6	2.3	4.3	4.2
Flood	5.6	3.1	4.0	4.2
Epidemic/Disease Outbreak	2.4	2.3	0.4	1.4
Man-made Disaster				
Increase in Food Prices	2.4	0.0	0.0	0.6
Serious Accident of Family Member	0.0	0.0	1.2	0.6
Death of a Family Member	0.8	1.6	2.8	2.0
Financial Crises	5.6	0.0	1.6	2.2
None	1.6	1.6	0.8	1.2

Sample rice farmers in Western Visayas employed different strategies to cope with the impacts of the most severe natural disaster that they experienced in the last two years. The tables that follow present the different coping strategies of rice farmers, classified into food-related, non-food, education-related, health-related, assistance, and other strategies.

The rice farming household included in the study, generally reduced spending to cope with the impacts of the most severe natural disaster. Most of them shifted to cheaper food items, limited the use of electricity, shifted to generic and cheaper drugs, or requested their children to skip classes. In terms of assistance, most of the farmers relied on the government, relatives and friends for support.

Table 28. Percent Distribution of Rice Farmers by Food-related Coping Strategy for Most Severe Natural Disaster Experienced, By Treatment Group

	With Insurance, with claims (n=125)	With insurance, without claims (n=128)	Without insurance (n=253)	Total (n=506)
Shifted to cheaper food items	36.8	35.2	32.0	34.0
Ate less preferred food	31.2	31.3	26.5	28.9
Relied more on own produce	25.6	25.8	22.5	24.1
Ate more ready-to-cook food	27.2	23.4	22.1	23.7
Consumed staple food only	22.4	24.2	19.8	21.5
Skipped meals	20.8	12.5	14.6	15.6
Lessened the frequency of dining out	15.2	15.6	13.8	14.6
Bought food on credit	14.4	15.6	13.8	14.4
Bought cooked food	12.8	8.6	8.7	9.7
Reduced portions	28.8	22.7	22.1	4.2
Relied on school feeding	0.8	0.8	2.4	1.6

Table 29. Percent Distribution of Rice Farmers by Non-Food Coping Strategy for Most Severe Natural Disaster Experienced, By Treatment Group

	With Insurance, with claims (n=125)	With insurance, without claims (n=128)	Without insurance (n=253)	Total (n=506)
Limited use of electricity	17.6	14.8	13.0	14.6
Shifted to cheaper means of transportation	9.6	14.1	12.6	12.3
Shifted to cheaper fuel sources	7.2	6.3	6.7	6.7
Limited use of cooking fuel	6.4	4.7	6.7	6.1
Limited use of water	5.6	7.8	5.9	6.3
Skipped/postponed consuming products/services	4.8	3.1	4.3	4.2
Bought second-hand items	0.8	1.6	1.2	1.2
Shifted to residential unit with cheaper rent	0.0	0.0	1.2	0.6

Table 30. Percent Distribution of Rice Farmers by Education-related Coping Strategy for Most Severe Natural Disaster Experienced, By Treatment Group

	With Insurance, with claims (n=125)	With insurance, without claims (n=128)	Without insurance (n=253)	Total (n=506)
Children in school skipped classes	9.6	11.7	10.7	10.7
Reduced allowance for children in school	6.4	10.9	7.5	8.1
Shifted to cheaper school supplies	4.0	8.6	6.7	6.5
Withdrew children from school	0.0	0.0	1.6	0.8
Postponed enrollment of children in school	0.0	0.0	1.2	0.6
Transferred children from private to public school	0.8	0.0	0.4	0.4

Table 31. Distribution of Rice Farmers by Health-related Coping Strategy for Most Severe Natural Disaster Experienced, By Treatment Group

	With Insurance, with claims (n=125)	With insurance, without claims (n=128)	Without insurance (n=253)	Total (n=506)
Shifted to generic and cheaper drugs	12.8	14.8	12.6	13.2
Shifted to cheaper alternative medicine	9.6	15.6	11.5	12.1
Shifted to self-medication	9.6	13.3	9.9	10.7
Reduced use of health products/services	6.4	7.0	6.3	6.5
Stopped or postponed seeking treatment or medication	1.6	3.9	2.4	2.6
Shifted to government health centers and hospitals	0.8	2.3	1.6	1.6

Table 32. Percent Distribution of Rice Farmers by Health-related by Coping Strategy through Receipt of Assistance for Most Severe Natural Disaster Experienced, By Treatment Group

	With Insurance, with claims (n=125)	With insurance, without claims (n=128)	Without insurance (n=253)	Total (n=506)
Assistance from the government	32.8	24.2	24.5	26.5
Financial support from relatives	20.0	14.8	15.8	16.6
Assistance from the private sector	13.6	12.5	9.9	11.5
Other material support from relatives	12.0	14.1	11.1	12.1
Financial support from friends/neighbors	8.8	7.8	7.1	7.7
Other material support from friends/neighbors	8.0	7.8	5.1	6.5

Table 33. Percent Distribution of Rice Farmers by Demographic and Other Coping Strategies for Most Severe Natural Disaster Experienced, By Treatment Group

	With Insurance, with claims (n=125)	With insurance, without claims (n=128)	Without insurance (n=253)	Total (n=506)
Spent less time for recreation	8.0	11.7	9.5	9.7
Postponed childbearing	4.0	7.0	5.9	5.7
Worked overtime	2.4	6.3	4.0	4.2
Transferred to temporary housing/evacuation center	4.0	3.9	3.6	3.8
Members from other households moved in (to cut expenses)	3.2	2.3	1.2	2.0
Members moved away	0.8	0.8	0.8	0.8

Farmers employ risk mitigation strategies to lessen the adverse impacts of natural and man-made disasters. In the case of the sample rice farmers in Western Visayas, the primary risk mitigation strategy was adoption of an earlier

or later planting date which reported by more than 26 percent of the sample. This strategy was employed both in the wet and dry seasons. Other farmers used rice varieties with high resilience, high temperature tolerance, or resistance to salinity, drought and flood.

Table 34. Distribution of Farmers by Risk Mitigation Strategy in Crop Production, By Type of Season

	Dry Season	Wet Season
Adopting earlier or later planting date	135	136
Use of varieties with high resilience, high temperature tolerance, resistance to salinity, drought and flood	27	27
Crop rotation	16	12
Alteration of farm management practices	11	9
Use of site specific nutrient management	7	5
Integrated pest management	5	5
Crop diversification	3	5
Product diversification	4	1
Others	3	4

The respondents were requested to rate the different product and service characteristics of PCIC based on their own experience, with a highest rating of 4 (Very Satisfactory), and a lowest rating of 1 (Very Unsatisfactory). The table below shows the average rating for the different characteristics by farmers with insurance, both with and without claims. Those who avail agricultural insurance are generally satisfied with the services provided by PCIC.

High rating was given on the affordability of the premium payment and the number of forms to be filled out for enrollment and the ease of accomplishing them. However, rice farmers are expecting improvement in the sufficiency of the actual indemnity received so that the amount will be enough

to finance next season's planting. Farmers also gave a much lower score on the length of time of processing of claims from filing to actual receipt of indemnity. This indicates that farmers find this too long and believe that this service should be shortened by the PCIC.

Table 35. Farmers' Ratings of PCIC products and services.

	With insurance, with claims	With insurance, without claims	Total
The number of forms to be filled up for enrollment and the ease of accomplishing them	3.1	3.0	3.1
The accessibility of the PCIC office	2.9	2.9	2.9
The affordability of the premium payment	3.2	3.2	3.2
The accessibility of payment channels available for paying the premium (via loan deduction, etc.)	3.1	2.9	3.0
The sufficiency of the risks covered when compared to risks faced by farmers in crop production	3.0	3.1	3.0
The adequacy of the amount of cover to be received when a loss occurs for financing next season's planting	2.7	2.7	2.7
Available feedbacking mechanisms (communication channels) in case of questions in enrollment or claims	2.9	2.8	2.8
The procedure for filing indemnity claims (forms to be filled up, etc.)	3	2.7	2.9
The objectivity of assessment in processing the indemnity claims	2.9	2.7	2.8
The sufficiency of the actual indemnity received to finance next season's planting	2.6	2.5	2.6
Length of time of processing claims from filing to actual receipt of indemnity	2.6	2.6	2.6
Overall satisfaction with PCIC's products and services	2.9	2.8	2.9

Net Income from Production

Net income from crop production shows all earnings from rice plus indemnity receipts less costs and insurance premium. The average net income of all farmers in 2014 and 2015 were positive. Those with bigger farms earned the highest net incomes and treatment groups. Interestingly, smaller sized farms of half a hectare and below have higher net earnings compared with bigger farms, of more than half to one hectare. This can be observed for groups with insurance but not among farmers without crop insurance.

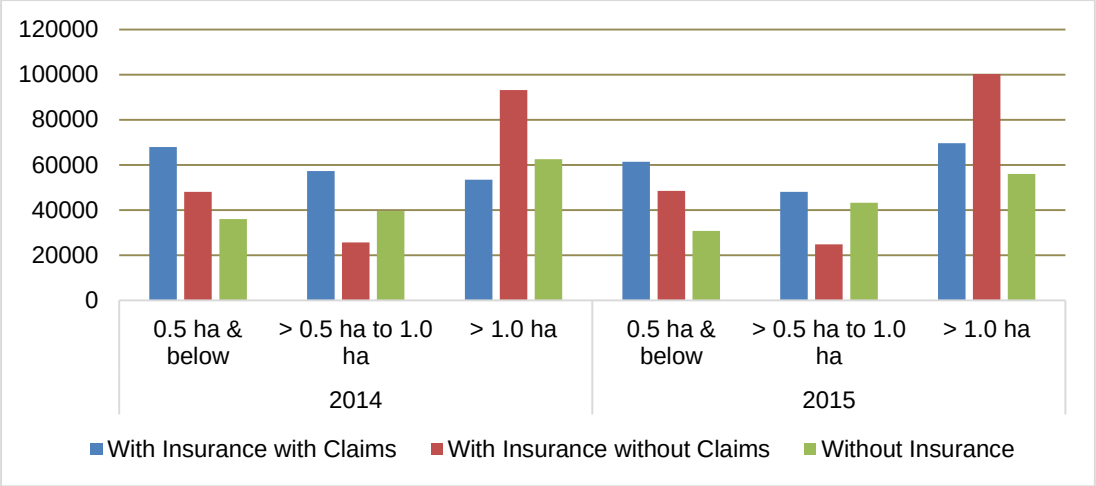


Figure 4. Net income of rice farmers, by treatment group and farm size, 2014-2015

Table 36. Net income of rice farmers, by treatment group and farm size, 2014-2015

Treatment	Farm Size	2014	2015
With Insurance with Claims	0.5 ha & below	67,880	61,325
	> 0.5 ha to 1.0 ha	57,253	48,039
	> 1.0 ha	53,431	69,610
With Insurance without Claims	0.5 ha & below	47,974	48,399
	> 0.5 ha to 1.0 ha	25,639	24,767
	> 1.0 ha	93,181	100,199
Without Insurance	0.5 ha & below	35,949	30,677
	> 0.5 ha to 1.0 ha	39,482	43,178
	> 1.0 ha	62,507	55,980

To determine if crop insurance has impact on rice farmers' net income, the difference between the groups were estimated. The first column in table 26

shows the difference in net income of farmers with insurance and without insurance. For 2014, the positive difference in income can only be observed among smaller farms. The year 2015 shows improvement such that smaller and bigger farms experienced positive impact from insurance. For both years, the highest income difference was among farmers with smaller farms.

The second column shows the difference in net income from rice production of farmers with insurance with indemnity claims and those without insurance. In 2014, only the bigger farms have negative income difference, for the other two farm size categories the difference is positive. While in 2015 positive income difference is observable in all farm size categories. Similarly, the highest positive income difference is observed among small farms.

The last column shows the difference in incomes of farmers with insurance without claims and the farmers without insurance. For both years 2014 and 2015, all farmers with crop insurance without claims earned higher incomes than farmers that did not avail of crop insurance except for those with farm sizes of 0.5 ha to 1 ha. The difference in income increases as farm size increases. When all three groups of rice farmers, according to treatment category and farm size were compared in terms of income difference, it is notable that positive income is higher between farmers with insurance with claims and farmers whose farms do not have crop insurance. Moreover, the income indifference is more pronounced between smaller farms with insurance with claims and without insurance. The highest income difference is therefore between farmers with insured rice farms and with claims and farmers with uninsured farms of the smallest farm size category.

Table 37. Difference in Annual Net Income of farmers with insurance and without insurance, by farm size, 2014 & 2015

	With Insurance		With Insurance with Claims		With Insurance without Claims	
	2014	**2015**	**2014**	**2015**	**2014**	**2015**
0.5 ha & below	17,756	21,443	26,727	28,506	14,129	18,588
> 0.5 ha to 1.0 ha	(694)	(8,731)	18,911	14,817	(14,656)	(25,500)
> 1.0 ha	(1,019)	19,831	(6,472)	18,920	20,431	23,411
All farm sizes	4,024	7,495	8,118	18,835	25	(3,580)

To account for the possible increase in prices during the reference period, the net income from rice farming between farmers with insurance and without insurance were deflated to 2013 rice farm gate prices. The next table shows these differences as well as the results of the t-tests. For 2014, the t-tests, show that differences in net rice farming income were positive and significant at one percent for all farm size categories. When t-test was calculated for each farm size category, all were positive and significant except for farms higher than one hectare. For 2015, difference in net income from rice production for all farms was also positive and significant at 10%. T-tests for individual farm categories showed positive differences in income, for farm size categories 0.5 ha & below and greater than 0.5 to one ha, these income differences are not significant. One possible reason for this result is the magnitude in devastation experienced after typhoon Yolanda. The losses experienced by farmers with insurance were quite high that insurance did not do much to augment net income from rice production, hence indicating that it did not have much impact on farmer farmers with insurance.

Table 38. Statistical comparison of Net Farm Income per hectare between Rice Farmers with and without Agricultural Insurance in Western Visayas, by Farm Size, 2014-2015

Farm Size	Income Difference in 2014 (in Php)	Income Difference in 2015 (in Php)
0.5 ha. & below	2,376**	1,298^{ns}
> 0.5 to 1 ha.	1,363**	184^{ns}
> 1 ha.	1,353^{ns}	2,376**
All Farm Sizes	1,714***	1,177*

Note: Diff = Difference in net farm income per hectare of rice farmers with and without insurance; ^{ns} not significant; * significant at 10%; ** significant at 5%; *** significant at 1%

Factors Affecting Insurance Uptake

Farmers will continue to get crop insurance if it is useful to them. Uptake also reveals the preference of farmers for less risky ventures and access to credit. The demand for rice insurance among farmer respondents in Western Visayas was determined using Random Effects Probit Model. The dependent variable is availment of insurance in 2015, which takes the value of one if the farmer availed of rice insurance in 2015 and zero if she/he did not. The control variables were year; experience of rain shock in the past; farmer's and household characteristics which includes sex, educational attainment, farming experience, dependency ratio; indices for household assets, agricultural assets, membership in organization and social protection, insurance availment; type of crop, access to irrigation, flood topography, cropping system, land area devoted to rice, government transfer, non-farm wage, non-farm entrepreneurial activities and PCIC priority area.

Out of the abovementioned explanatory variables, seven came out to be statistically significant (see Table 39) at one percent, five percent and 10 percent levels of significance. These are year, experience of past rain shock,

farmer's educational attainment, access to irrigation, flood topography, government transfer, and pcic priority.

Table 39. Probit regression results
Dependent Variable: Availment of Agricultural Insurance in 2015 (Yes=1)

Variable	Coefficient	Std. Err.	Z	P>z
Year	0.411	0.122	3.38	0.001
Past Rainfall Shock	0.453	0.248	1.83	0.067
Farmer's Sex (Male = 1)	-0.080	0.316	-0.25	0.801
Farmer's Education				
At least college level	-0.345	0.301	-1.15	0.251
College graduate	0.572	0.276	2.07	0.038
Years of Experience	0.004	0.008	0.42	0.672
Organizational Program Index	-0.053	0.083	-0.64	0.525
Dependency Ratio	-0.007	0.005	-1.33	0.183
Household Asset Index	-0.027	0.071	-0.38	0.707
Agricultural Asset Index	0.135	0.098	1.38	0.168
Credit Availment Index	0.016	0.044	0.36	0.722
Use of hybrid variety (Yes=1)	0.318	0.369	0.86	0.389
Percent of land owned	0.103	0.218	0.47	0.638
Access to irrigation (Yes=1)	0.370	0.218	1.70	0.090
Topography (River/Flood Plain)	0.485	0.288	1.69	0.092
Intercropping (Yes=1)	-0.340	0.392	-0.87	0.386
Total area devoted to rice	0.017	0.118	0.14	0.888
Government Transfer (ln)	0.031	0.018	1.71	0.088
Non-farm Income Wage (ln)	0.000	0.010	0.01	0.993
Non-farm Income Entrepreneurial Activities (ln)	0.017	0.028	0.63	0.529
PCIC priority area	-0.742	0.400	-1.86	0.064
Constant term	-6.182	1.948	-3.17	0.002

The variable Year represents the period or periods when the farmer had his/her rice farm insured. The positive coefficient shows that the probability of getting crop insurance was higher in 2015 than in 2014. The data show that indeed this is the case in Western Visayas since more farmers enrolled their farms in rice insurance during the second year of the observation period. This result can be explained by the occurrence of Typhoon Yolanda in November

2013 which devastated Western Visayas. The fairly recent experience of a very strong typhoon could be one reason for the higher uptake of crop insurance in 2015. Although most farmers had already harvested their palay when the typhoon struck, the massive destruction left behind could be a compelling motive that prodded the farmers to insure their crop. Moreover, the PCIC implemented special program Yolanda, which gave out free rice insurance in Yolanda-affected areas in Western Visayas. The Yolanda program started during the second quarter of 2014 thus covering the 2014-2015 cropping period.

Another explanatory variable that significantly influenced the probability of availment of rice insurance among farmers in Region 6 was farmer's experience of past rain shock. This is a dummy variable that took the value of one when the farmer had past experience of rain shock and zero if none. The coefficient is positive which implies that the probability of rice insurance uptake increases with farmers' previous experience of heavy rains which could have either damaged their own or other farmers' rice farms in the vicinity. The result indicates that risk aversion is much higher when perils have been experienced before. The risk aversion translates into enrollment of rice parcels in insurance.

The farmer's educational attainment, particularly those who had at least some college education, came out as significant in affecting the dependent variable. The coefficient turned out to be positive such that the probability of getting crop insurance increases if the farmer has reached college. This result is consistent with expectation that the higher the educational attainment, the more knowledgeable farmers are pertaining to crop production risk mitigating mechanisms such as insurance.

Access to irrigation is also one of the regressors that significantly affect the likelihood of a rice farm being insured. The result for this variable shows a positive coefficient implying that access to irrigation increases the probability that a farmer will enroll his rice farm in crop insurance. One of PCIC's criteria to qualify for crop insurance is the presence of an effective irrigation system in the area where the farm is located. Hence, farmers whose farms are accessible to irrigation have a higher tendency to get crop insurance.

Topography (river/flood plain) is a dummy variable that assumes the value of one if the rice farm is flood-prone and zero if it is not. A positive beta coefficient for this variable means that the probability that a farmer will have rice insurance is higher if his parcel devoted to rice has the tendency to be flooded. Indeed the result obtained for this variable is positive. This finding supports the expectation that risk aversion increases the likelihood of crop insurance uptake.

Another variable that significantly affect the dependent variable is government transfers (in natural logarithm) which corresponds to the amount of government assistance that the farming household receives such as conditional cash transfer and other subsidies. The sign of the coefficient is positive which implies that the probability of crop insurance uptake increases with the amount of government transfers. The special programs of PCIC are intended for needy farming households hence most likely these farmers who availed of these free insurance also recipients of government transfers.

Lastly, the coefficient of variable PCIC priority area came out as statistically significant with a negative coefficient. This variable is a dummy that takes the value of one or zero, one if the insured farm is located in the in the same province/municipality as the PCIC office and zero otherwise. The

expectation is that the nearest farms to PCIC would be prioritized in terms of crop insurance provision. The result of the probit regression for this variable implies the opposite of this expectation. For rice farmers in Western Visayas, the probability of getting their farms insured is higher when the area is not within the province or municipality where the PCIC office is located. PCIC therefore does not only serve the farmers nearest to them, rather they serve those that fit the eligibility criteria and these farmers may not necessarily near their office.

Impact of Crop Insurance on Income from Rice Farming

Impact of insurance on rice farmer's income were determined using random effects panel data regression. The regression was first applied on data for all farms then for each of the three farm size categories. Regression analysis was done for all sample farmers and for matched sample. Matched samples are pairs of rice farmers with insurance and without insurance that satisfy at least three of the five critical matching variables – area devoted to rice, farm location, ARB status, access to irrigation, and farm tenure status. The result for all farms (Table 40) show that variables affecting net income from rice were the following--- if the shock caused farm losses, farmer's age, square of farmer's age, farmer's sex, availment index, irrigation access, cropping system, non-farm wage and non-farm income from entrepreneurial activities.

Table 40. Estimated impact of agricultural insurance on net farm income for paired farmers with and without agricultural insurance in Western Visayas and control variables with statistically significant coefficients, by farm size

Model	No. of samples	Estimated Impact	Variables with statistically significant coefficients and corresponding sign
All samples			
All farm sizes	494	1.21 ns	shock_causeloss (+), farmer_age (+), farmer_age2 (-), farmer_sex (+), availment_ind (-), irrig access (+), cropsystem_inter (-), farm wage (+), nfarm entrep (-)
0.5 ha. & below	128	3.67 ns	farmer_age (+), farmer_age2 (-), farmer_sex (+), availment_ind (-), pct_owned (+), nfarm_entrep (-)
> 0.5 to 1 ha.	225	3.04 ns	shock_causeloss (+), farmer_age (+), farmer_hgc20 (+), dep_ratio (+), nfarm_entrep (-)
> 1 ha. to 3 has.	141	1.61 ns	farmer_exp2 (+), nfarm_entrep (-)
			Matched samples
All farm sizes	474	0.70 ns	shock_causeloss (+), farmer_age (+), farmer_age (-), farmer_sex (+), farmer_hgc20 (+), availment_ind (-), irrig_access (+), topog_flood (+), nfarm_entrep (-)
0.5 ha. & below	124	3.77 ns	farmer_age (+), farmer_age2 (-), farmer_sex (+), availment_ind (-), hybrid (-), pct_owned (+), nfarm_entrep (-)
> 0.5 to 1 ha.	215	2.43 ns	shock_causeloss (+), farmer_age (+), farmer_sex (+), farmer_hgc20 (+), dep_ratio (+), nfarm_entrep (-)
> 1 ha. to 3 has.	135	0.40 ns	farmer_exp2 (+), aggreasset_ind (+), topog_flood (+), nfarm_entrep (-)

NOTE: ns – not significant. Only variables that were found significant up to 10% level were presented in the last column of this table.

Table 40. *Continuation*

Model	No. of samples	Estimated Impact	Variables with statistically significant coefficients and corresponding sign
Matched samples (T1 vs. T3)			
All farm sizes	404	-0.80 ns	amt_cov_std (+), shock_causeloss (+), farmer_age (+), farmer_age2 (-), farmer_sex (+), availment_ind (-), irrig_access(+), topog_flood (+),
0.5 ha. & below	103	3.46 ns	shock_causeloss (+), farmer_age (+), farmer_age2 (-), availment_ind (-), pct_owned (+),
> 0.5 to 1 ha.	184	-0.30 ns	amt_cov_std2 (+), shock_causeloss (+), farmer_age (+), farmer_hgc20 (+), topog_flood (+),
> 1 ha. to 3 has.	117	-1.49 ns	nfarm_entrep (+)
Matched samples (T2 vs. T3)			
All farm sizes	469	0.70 ns	shock_causeloss (+), farmer_age (+), farmer_age2 (+), farmer_sex (+), farmer_hgc 20 (+), availment_ind (-), irrig_access (+), topog_flood (+), nfarm_entrep (-)
0.5 ha. & below	124	4.33 ns	farmer_age (+), farmer_age2 (-), farmer_sex (+), availment_ind (-), hybrid (-), pct_owned (+), nfarm_entrep (-)
> 0.5 to 1 ha.	212	0.22 ns	shock_causeloss (+), farmer_hgc20 (+), dep_ratio(+), nfarm_entrep (-)
> 1 ha. to 3 has.	133	-0.58 ns	farmer_exp2 (+), farmer_exp2 (+), agriasset_ind (+), topog_flood (-), nfarm_entrep (-)

NOTE: ns – not significant. Only variables that were found significant up to 10% level were presented in the last column of this table.

The income from rice farming increases when the shock experienced caused farm losses by two percent. Age also positively influenced income from rice since longer farming experience is associated with older farmers. Income increased by 0.3 percent as age increases by a year. Rice income is higher when the farmer is male by about 3 percent. This not a surprising result though since most of the respondents are men.

The availment index describes the farmer's awareness and availment of physical infrastructure facilities, cooperative, credit, training, and other farm-related government subsidies such as discounted fertilizer and certified seeds in their barangay or municipality. The index score increases with higher awareness and availment of these facilities. The result of the regression shows a negative coefficient for the availment index which implies that the lower the level of awareness and availment of farm equipment and financial facilities, the higher the income. Hence, the farmer is better off if he/she has lower level of awareness because it has a positive effect on his rice income. The negative sign runs opposite to the expectation that the higher the awareness and availment of various facilities, the higher the income from rice production. The nature of the regressor is one of the possible explanations for this result. Since it is a composite index that lumps together credit, farm equipment training, discounts on seeds and fertilizer, among others, it is possible that the index score has muted or downplayed the variables that really matter to rice income. Farm equipment for example is not important for small-sized farms because most of the work are done manually whereas credit and micro-finance institutions are more important as affordable sources of loans. If this is the case, then it would be better if we have separate index for equipment, training and

financial facilities. Another possible reason is that farmers do not really rely on these facilities for their rice farming needs. They may have their own equipment or may not have the need for it, hence scoring low in the index. Moreover, most of them have been relying on their own funds to finance rice farming and seldom availed of credit.

Irrigation access increases net farm income by 2.4 percent. Flood topography also showed positive relationship with net farm income. This means that it the farm is located in a flood-prone area, income is higher by 3.4 percent. This result seem to be a paradox because we expect that flood prone areas to generate lesser income to farmers but if we relate this finding to the result from the probit regression above, it may not be that inconsistent. Since farmers know that their farm is prone to flooding, they have already devised coping mechanisms to mitigate losses such as adopting the appropriate seed sowing method or changing the planting calendar to avoid heavy rains that are damaging to crops. Insurance is also an important risk mitigating strategy. As shown by the Probit regression, rice farmers with flood-prone farms have the higher likelihood to get insurance.

Water availability is generally favorable to rice farming. Most rice farmers in the region and particularly in Iloilo, have their own shallow tube wells as fallback during prolonged dry season or when irrigation is not available. Hence, a flood-prone farm topography can have positive effects on rice income because the farmer doesn't have to pump water (a common practice in Western Visayas) to irrigate the farm thus lessening production cost. Moreover, irrigation flow is also better for low lying farms they may have up to three cropping seasons.

The variable *cropsystem_inter* is a dummy variable for type of cropping system which takes on the value of one if the farmer is intercropping rice with other crops. Since intercropping is either the cultivation of two or more crops simultaneously on the same farm or planting the other crop after the harvest of the other crop. The coefficient implies that if the farmer is intercropping rice with other crop/s, net income from rice will be lower by 3.3 percent. Intercropping may decrease rice income but not necessarily income from all crops, hence the farmer is not necessarily worse off. Indeed the reduction in rice income is highly probable since intercropping with another crop simultaneously with rice will necessarily reduce area planted to rice and income as well. Similarly, if another crop (e.g.watermelon) is planted after rice is harvested devoting the next planting season to another crop will decrease rice production and income from rice. Farmers in Western Visayas, intercrop with high value crops such as mungbean or watermelon to augment income or when farmgate price of palay is low or when the weather is favorable for the other crop.

Non-farm wages is also one of the factors that significantly affect income from rice farming. The positive beta coefficient shows that a one percent increase in non-farm wages results to a .083 percent increase in income from rice production. Higher income from wages earned non-farm related work implies possible additional capitalization for rice farming, hence the positive relationship of non-farm wages to the dependent variable. Non-farm entrepreneurship income on the other hand causes net income from rice to decline, such that a one percent increase in earnings from non-farm

entrepreneurial activities will reduce net income from rice farming by 0.1854 percent.

The impact of insurance on rice farming is indicated by the coefficient of the predicted probability of crop insurance availment is also presented in Table 40. Based on the coefficient, having crop insurance increases net income from rice farming by 1.2 percent. Although the variable is not a significant predictor of net income from rice production, it shows that impact is positive.

The model was also applied to each farm size category to estimate the impact of crop insurance on net income from rice production. For farms of 0.5 ha. & below, the factors that significantly affect net income are farmer's age and sex, availment index, parcel tenure status, and non-farm entrepreneurial income. Almost the same explanatory variables came out as significant predictors except for the dummy variable parcel tenure status, which has a value of one if the parcel is owned by the farmer and zero if not. The positive sign of the coefficient shows that net income from rice farming increases by one percent if the farmer is the landowner. As for the impact of crop insurance, the coefficient of the probability of insurance availment shows that the effect of crop insurance on net income from rice farming is 1.25 percent. If the farmer gets crop insurance, his/her income increases by the above-mentioned magnitude. The availment variable however has minimal influence on income as indicated by the p-value.

The regression results for farm size categories, greater than 0.5 to 1 ha, and greater than 1 hectare to 3 hectares, reveal that the impacts of crop insurance are 3 percent and 1.6 percent, respectively, although not significant.

Regressions were also done for matched samples, with insurance and without insurance (T1,T2 and T3); with insurance with indemnity claims and without insurance (T1 and T3); with insurance with claims and with insurance without claims (T1 and T2); and with insurance without claims and without insurance. The independent variables that came out to significantly affect the net rice production income were similar. What is noteworthy however is how the impact of is crop insurance on net income increases as farm size category decreases such that for bigger sized farms the effect of having crop insurance is lesser compared with small sized farms. This is true whether the impact is positive or negative. In cases where impact of crop insurance is negative, the negative impact is lesser on small farms compared with bigger farms.

Chapter 5: Summary, Conclusions, and Recommendations

Summary and Conclusions

This study hypothesized that crop insurance as a risk management tool will increase income of rice farmers. The results of the study show that rice farmers in Western Visayas are mostly married males who are typically in their 50s, belonging to a household with 4.5 members and had least elementary education. On the average, their farm size is only one hectare while their farming experience is 26 years.

Majority of the farmers with crop insurance were enrolled in the program for two consecutive years. Majority of those who availed of crop insurance for two consecutive years were the ones who received indemnity payments.

The most common reason cited by farmers for getting crop insurance is the information given by their agricultural technician from the LGU. Those who did not have crop insurance on the other hand, explained that lack of knowledge about crop insurance or about the process of enrollment prevented them from getting one.

Rice farming operations are generally self-financed by farmer respondents. Borrowing is done only if savings are insufficient. Sources of credit are mostly informal such as the local moneylender or relatives and friends. Loans availed are often used to purchase farm production inputs, for farm improvement, and household consumption.

The results of the Probit regression analysis reveal that the likelihood of farmers enrolling their rice farm to crop insurance increases in the year 2015, if the farmer has previous experience of rain shock, receives government transfer and has some college education. Farm characteristics such as access to

effective irrigation and being flood-prone have also a positive effect on likelihood of uptake of rice insurance. On the other hand, being a PCIC priority area has inversely affected the probability of availment.

Typhoon and drought are the most severe shocks experienced by rice farmers in Region VI in the last two years. The most common farming adaptation method is changing the planting calendar. Coping mechanisms in consumption on the other hand, include shifting to cheaper food items, reducing electricity consumption, letting children skip school and limiting recreational activities. In terms of healthcare, coping strategies are shifting to cheaper medicines or self-medication.

Half of the farmers who received indemnity payments used the money to finance farming operation for the next planting season. Others used it either for food or school expenses.

The result of the impact evaluation shows that insurance has positive impact on the income of rice farmers. The random effects panel regression show that crop insurance raised the income of rice farmers in Western Visayas compared to the control without insurance. The regression results further showed that when farm size was considered, the positive impact of crop insurance increases as farm size decreases. This finding is consistent for various regressions on different matched samples.

This results of the impact evaluation lead us to the following conclusions for Western Visayas' rice farmers. Risk aversion and experience of peril are compelling reasons why farmers assure their rice farms. Government transfers increases the uptake of crop insurance among farmers. PCIC does not only serve rice farmers who are conveniently located near their offices despite the

lack of personnel, they also serve farmers in other provinces and municipalities. Distance from the PCIC office therefore is not important, farmer's will get crop insurance as long as they are qualified and eligible.

The bundling of credit and crop insurance improved the rice farmers' access to credit. Crop insurance have positive impact on the income of rice farmers. Farmers with smaller farm sizes benefitted more from crop insurance compared to bigger farms. The impact of rice insurance on farmers' incomes is negative between those with crop insurance with indemnity claims and those that have no insurance. The losses can be very high that indemnity payments are not enough to cover for these losses

Recommendations

Based on the results and conclusions, the following are the recommendations: One is to increase penetration rate among small farm holders. The municipal farm technicians can be tapped to help in the awareness campaign of crop insurance since they are in constant communication with the farmers. Enhance the impact of crop insurance among bigger farms by designing more crop insurance packages that benefits them.

One of the best practices of PCIC crop insurance is the bundling with formal credit. This mechanism not only enhances access to formal credit among farmers but also encourages credit institutions to increase availability of loans to agriculture. It is recommended that this system be expanded to widen the available credit for farmers.

It is also recommended that PCIC services be improved particularly the processing and releasing time of indemnity claims. One option is to put up satellite offices in strategic areas so farmers can easily access PCIC services.