The Impacts of Enhancing Traditional Rice Production in the Upland Regions of the Philippines

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Acknowledgements:

Reflection:

One of the biggest barriers in the research was the logistics of surveying. The farmers interviewed were all from isolated, indigenous parts of the Philippines. There is a lot of previous history that involves tension between foreign researchers and the native population. There have been instances in the past when people would come to these regions claiming to do research and would end up exploiting the population. Farmers are also against some of the developments and projects of the International Rice Research Institute in the Philippines (IRRI), for example genetically modified organisms. For this reason, many farmers were wary to talk to the researchers from IRRI. We had to start each interview with a lengthy and comprehensive privacy/anonymity agreement to form a level of trust between the farmers and the researchers. There was even one location that my team could not travel to for fear that our security as Westerners would be in danger. The research team also experienced instances where people would not be willing to report negative results to IRRI for fear that IRRI would retaliate by taking away their resources. Additionally, the surveys were being conducted during monsoon season so travelling to the mountains presented some dangers. For example, the rain would cause frequent mudslides and block off the roads. Finally, there was a language barrier. Many of the farmers didn't speak the Filipino national language, Tagalog, and only spoke their native dialect. The team needed to use translators and get the survey translated in a way that did not change the meaning of the questions. But these working through these challenges has been an amazing and eye-opening experience. One of the most important lessons I learned when interacting with the farmers was the importance of trust and good relationships. Without that initial bond, people

were not even willing to talk to us. A big part of the work was taking a step back from the research and understanding the humanity behind the person being interviewed. It was an extremely humbling experience.

Credits:

I would like to thank all my wonderful mentors at IRRI. Dr. Cecelia Acuin is a revolutionary woman and an amazing teacher. She was always willing to share her knowledge and have an enriching conversation. Dr. Ana Cope is a brilliant scientist and her fascination with earthworms never fails to amaze. Dr. Joyce is an extremely patient woman. We all own her for the time she spent answering all our questions and translating from Tagalog into English.

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Abstract:

The goal of this study was to measure the nutritional status of the farmers who are part of the Heirloom Rice Project (HRP). Most of these farmers grow traditional breeds of rice. All of

the farmers are from the upland region of the Philippines where conditions are not favorable for growing rice. The surveys used in the study were the Food Insecurity Experience Scale (FIES) developed by the Food and Agriculture Organization (FAO) and the Food Consumption Score (FCS) developed by the World Food Program. Both of these surveys aim to measure how much food and nutritional insecurity the farmers face. Major findings of the surveys show that the farmer population is aging, there are still a lot of undernourished farmers and the importance of cooperative.

Introduction:

Heirloom rice is the rice varieties native to a specific region. These varieties have been passed down by farmers for generations. These are not used for large scale commercial agriculture. The objective of the HRP is to raise the productivity of traditional rice varieties through empowering communities in unfavorable rice-based ecosystem, specifically upland regions. The slogan for the initiative is "capturing value, preserving heritage". The reasoning behind this is that traditional rice varieties tend to be more nutritious than commercial rice and by promoting these traditional varieties, we are preserving a critical part of the population's heritage. Upland areas are areas of high elevation. These areas are unsuitable for rice farming. The soil is bad quality, the land is hard to access, and the weather is colder (Garrity). The mountainous regions of the Philippines are not ideal for growing rice, so it is important to promote rice production in places where the conditions are not ideal, but the crop is still heavily relied on. The population we are studying is also an indigenous population that have been exploited and forgotten before. This research attempts to make sure their concerns are heard in the global sphere and to repair ties between the population and researchers. The data we collect will be used by IRRI to identify the strengths and weaknesses of their promotion of heirloom

rice. The data will also be used by the Department of Agriculture to recognize what regions in the Philippines are undernourished.

Different phases of the HRP attempt to tackle different parts of the production of rice from seed all the way to consumption. This paper focuses on component one and three of the first phase of the project. These components focus on value chain development. One of the goals of the project is to gain more information. There is a current need for more information for two main reasons. Firstly, as the global population works toward reaching the Sustainable Development Goal number 2 (SDG2) it is critical we have more information. SDG2 aims to eradicate hunger by 2030 (Smith). This ambitious goal is different than other previous goals because it aims not only to reduce hunger but remove it entirely. Eradication of hunger will be much more difficult because this requires tackling parts of hunger that are more chronic and nuanced. And thus, comes the necessity to gain more information about problems that are less well known. The second reason we need more information is because we need to protect vulnerable populations. There is a global push to leave no one behind in the food security discussions. Previous surveys and data were usually done on a nationwide scale (Petracchi). There was information about how many hungry people were living in a country, but usually not information about who these people are, where they live and what specific problems they face. Vulnerable populations such as children, women, indigenous people, and people who live in isolated parts of the world have often been forgotten. New survey methods and data are necessary to do a proper evaluation of the food insecurity situation among all populations. In an effort to do that the HRP is using a survey called the Food Insecurity Experience Scale (FIES). This survey was developed by the Food and Agriculture Organization (FAO). The history of the survey starts in the 1980's when researchers at Cornell University surveyed women experiencing

food insecurity in New York (Ballard). They found that despite the different experiences that the women face, there were several common trends in their experience of food insecurity. The researchers decided to use the common trends they discovered as markers of the severity of food insecurity. Then in 1995 the US Households Food Security Model was developed. This survey was developed by the US Department of Agriculture and used the benchmarks discovered in the Cornell study to measure the degree of food insecurity among the US. Then in 2004 the Latin American and Caribbean Food Security Scale was developed (Food). This survey used the same benchmarks as the US Households Food Security Model and proved that these benchmarks are universal among both developing and developed countries. Then finally in 2003 the FAO launched the Voices of the Hungry project. The FIES was officially drafted and included among this survey (Food). The FIES has been reliable and efficient in providing estimates of the proportion of certain populations who are facing difficulty obtaining food in sufficient quality or quality. The reason why the FIES is so different than previous surveys is because it characterizes hunger-qualitative data- into numbers-qualitative (Petracchi). This makes it possible to standardize an experience and compare the different levels of food insecurity experienced by different places.

Method:

These surveys are being conducted by IRRI in partnership with the Philippines Department of Agriculture and PhilRice as part of the Heirloom Rice Project (HRP). The HRP focuses on identifying, validating, and disseminating improved rice-based technologies in target areas of the Cordilleras suited to the diverse livelihood strategies of farmers in the highland communities, while protecting the environment, and preserving rice genetic resources (The Heirloom).

The objective of the surveys are twofold. First, we would like to get the farmers' perspectives of the problems they face in the farm, including those related to earthworms and other pests. Second, we would like to determine the diets and sources of food for the farmers' households, as well as their food security status.

To determine who would be surveyed, each province was broken down into their barangays. These barangays served as blocks in a stratified sample. We determined how many farmers to survey based proportionally on the rice area of each respective barangay. This is done to avoid one area of the province with large farm land to be overrepresented in the data. Ideally, the blocking ensures that a proportionate number of responses from every area of the province are represented. Then the farmers were randomly selected to participate in the survey. The respondents of the survey were of either gender, were farmers of rice –not necessarily heirloom– and many were indigenous people. Surveys were done in person for the heirloom rice farmers in the Mountain Province, Kalinga, Ifugao and Benguet. The research team traveled to the location of the farmer and asked the farmer questions based on a scripted, prewritten survey. All farmers were asked the same questions based on the survey. Consent for the interviews was obtained and the interviews were conducted in the local dialect.

The surveys had three distinctive parts. The first was establishing the basic background information and sociodemographic information of the farmers and their households. We included information that would be important factors in the pest/earthworm and diet and food security analysis. For example, we requested to know the family size of the farmers to understand how many people the food produced was intended to sustain. We also asked about the size of the farm and average yield of the farmers. It was also important to ask the rice variety that the farmers plant to get an understanding of the productivity of heirloom rice versus commercial rice.

The second part of the survey was intended to get information regarding current practices in managing pest/earthworm problems. The surveyors started by asking the farmers about the top 5 constraints (both biotic and abiotic) they face in the field. The question was intentionally broad to avoid skewing the data by suggesting the earthworms were a problem in the first place. Then if the farmers noted that earthworms were in their top five chadllenges the surveyors continued with questions about earthworms specifically. They were asked basics questions about the characteristics of the earthworm such as shape and size. Then they were asked about the damages the earthworms caused and how the farmers manage it. Finally, they were asked about their awareness of Integrated Pest Management. The second part of the survey was not analyzed by the nutrition team, but it is notable to mention because it was included in the complete survey.

The final part of the survey was to do a diet and food security analysis. The questions were based on a questionnaire that was developed by the Food and Agriculture organization (FAO). First, we asked questions about the prevalence of hunger and food security. The questions were asked in increasing severity in order to be able to distinguish between which households demonstrate mild to severe hunger and undernutrition (Food). The questions were translated into the native dialect so vary slightly from the exact template used by the FAO. The data was analyzed afterwards using the statistical R software recommended by the FAO. The second part of the nutrition survey was to use the Food Consumption Score (FCS) developed by the World Food Program. The FCS attempts to get a more complete view of the nutritional profile of the farmers. The FCS breaks down common food items into their food groups. Then depending on factors such as calories, micronutrient content and the necessity in a balanced diet, the FCS gives each food group a weight. Then you multiply that weight by the number of days in a week the food was eaten. When you add up the scores of all the food groups you get your final food

consumption score. The WFP categorizes scores of 0-28 to have poor food consumption, 28-42 to be borderline and over 42 to be acceptable.

Results and discussion:

The socio demographic analysis revealed some interesting key finding that can guide and monitor future policies and programs that tackle food insecurity. The percent of male farmers for Mountain Province was 43% to 57% female. The percent of males for Kalinga farmers was 48% to 52% females. The percent of males for Ifugao farmers was 51% to 49% female farmers. This may seem normal as the national ratio of male to female citizens of the Philippines is 1:1 (The World). However nationally, 89% of farmers are male farmers and only 11% are female farmers (Women). There is an obvious and drastic difference between the percentage of female and male farmers in the upland areas versus the national level. Even more interestingly, in this region the women also do the physically demanding part of farming. In other parts of the country when women are included in farming, they do the parts of farming that are not physically demanding such as weeding and planting (Balakrishnan). However, in this region the women also do physically demanding labor (plowing, tilling, etc). So not only do they outnumber the men but are also more involved in the entire farming process. This highlights the need for programs of women empowerment. Farming education programs should target women just as much as they target men. There should also be initiatives to teach women business management techniques in order for them to make a profit off of the rice they grow. Farming policy in this region should consider the disproportionate number of female farmers.

Another interesting finding is the average age of farmers for both men and women. In Mountain Province, both men and women averaged at 53 years old. For Kalinga, men averaged at 51 years old and women at 54 years old. For Ifugao, both men and women averaged at 54

years old. For all three regions and subpopulations the average age of farmers was over 50, which is characterized as an aging population. This is much higher compared to the national average of 23.5 years old (The World). It is important, especially for work such as farming which is labor intensive, to have a working population that remains young. The rice terraces are also more labor intensive than normal flat field because the steps require constant reconstruction and maintenance to prevent erosion (UNESCO). Having an aging working population presents a problem in the sustainability of the heirloom rice farms. This reflects a broader societal trend of young people being less attracted to farming as a livelihood (Villar). When conducting personal interviews with the farmers it was revealed by many farmers that one of their biggest problems was passing on the occupation of farming. Children no longer view farming as a respectable occupation and are leaving home for industrial jobs or to seek higher education. This presents an interesting problem. While it is important for future generations to seek education and it is necessary that people seek industrial jobs for a nation to develop, that only reduces the amount of people who are farming and sustaining the population. There must be a delicate balance struck between the two interests. The younger generation must go out and become education citizens but at the same time return home and preserve the culture that they grew up in.

The surveys also revealed that there was a lot of variance among farm size between the farmers. For Mountain Province the average house hold size was 1415 sq meters compared to a median of 500 sq meters. In Kalinga the average house hold size was 3,804 sq meters compared to a median of 1500 sq meters. In Ifugao the average house hold size was 4,106 sq meters compared to a median of 2,000 sq meters. All the averages are much smaller than the national average of 13,000 sq meters. This is not surprising considering the mountainous region limits farm size. In order to utilize the sloping land, farmers have to carve terraces into the sides of the

mountain instead of growing rice on vast flat fields. What is surprising though is the comparison between the average farm size and the median farm size. Within each province we can see that each average is more than twice as large as the median. This variance between average and median is due to the presence high outliers that are shifting the average (Birkett). There are several farms that are much larger than the other farms. For example, there is one farmer with a 10,000 sq meter sized farm. The large variation between farms sizes is a compelling reason to support the importance of farmers' cooperatives in the region. It is important for smaller farmers to work together in order to remain competitive with bigger farmers. For example, a farmers' cooperative can help small farmers form economies of scale and establish a market presence to sell rice on a more consistent schedule. These farmers cooperatives encourage farmers to pool resources so that they together can act as a stronger force (Araullo). It is also easier for the Philippines Department of Agriculture to provide aid to cooperatives instead of the individual farmer. For example, they can give fertilizer to the leader of the cooperative and have them distribute it, instead of having to take the time of visiting each individual farmer. The Department of Agriculture has also been able to introduce new technologies through cooperatives. For example, IRRI has developed a solar bubble dryer. The solar bubble dryer is a solar powered compartment with a fan where farmers can put their rice to dry. This is a much better alternative than what most farmers currently do to dry their rice which is to just dry it out on the street. Drying rice on the street leaves it susceptible to pest like rats or rice and also pathogens. Drying on the street can actually result in up to a third of losses in harvesting (Grain losses). The Department of Agriculture was able to distribute solar bubble dryers to different cooperatives so that the greatest number of farmers could get access to the technology.

Another figure to consider when analyzing data is that the average number of household members for Mountain Province, Kalinga, and Ifugao are 5, 6, and 6 respectively. Thus, statistics about food insecurity and consumption apply not only to 1 person, but rather the 5 or 6 people that live in a household.

The study also reveals that farmers grow a wide variety of different rice types. Most rice varieties are grown by only a couple of farmers. For example, rice varieties Kusimay, Lan-okan, and Madney were only grown by 1.4% of the population. The farmers also grow several different varieties of rice within their own farms. Each row will have a different variety of rice. Many of these rices, especially pigmented ones, have been shown to have more nutritional content than commercial white rice. Additionally, more than 80% of farmers reported that the rice they grown is their own and has been passed down in the family. This quantifies the importance of the heirloom rice varieties to these farmers.

Almost 100% of farmers transplant their rice. This is a normal planting strategy in which farmers directly put the seedlings into the soil rather than just scattering seeds. This produces more matured rice plants from each seed but it takes longer for the plant to mature. The problem we have discovered in the surveys with transplanting in the highlands is that farmers wait a longer time than recommended before they transplant the seedling into the field. The average number of days farmers let the seedlings grow before transplanting is 33 days. However, previous IRRI research has revealed that farmers should 30 days is the maximum number of days farmers should wait. Ideally the number of days should be around 20 (Manual). Waiting longer to transplant rice increases the amount of shock to the plant and decreases the chances that it will survive in the new environment. IRRI has recommended farmers to shorten the time they wait before transplanting. However, it has been hard to convince farmers to change their transplanting

practices because their farming practices are guides by strict spiritual and cultural traditions. Before they transplant the rice, there are elaborate and specific rituals that the farmers go through that prevent rice from being transplanted quickly. Additionally, in the mountain regions the temperature gets lower during the period when planting is done than the national average because of the high elevation. Unfortunately, seedling growth in the cold is usually slower and takes longer to get strong enough before transplanting.

Around 51% of farmers plant only one rice cropping per year. This is much higher than the national average. Medium growing rice takes about 120-140 days to go from planting to harvesting (Crop Calendar). This gives farmers enough time, assuming conditions are right, to grow about two rice croppings per year. This presents a problem to the market value of the heirloom rice. The rice cannot be constantly on the market because it is only grown once a year. The rice will also be much more expensive than other rice varieties on the market because there is not as much of it. Indeed, white rice is around Php 45-50/kg while heirloom rice is at Php 90-200/kg depending on where you buy it (it is more expensive in supermarkets). That puts heirloom rice at about 2-4 times more expensive than commercial white rice. Additionally, 71% of farmers report the rice produced being only for family consumption and only 16% being toward selling. There must be an initiative to support farmers creating sustainable enterprises by seeing their products. In an increasingly commercial marketplace it is important that farmers have extra cash so that they can buy into the market.

An analysis of the FIES data shows that on average 12.22% of farmers from the three provinces experience moderate and severe food insecurity. 0.212% experience severe food insecurity. This is compared to a national average of 25.3% experiencing moderate and severe food insecurity and 1.2% experiencing severe food insecurity. This is not surprising because

national data also finds that the Cordillera administrative region is the second most wealthy area behind only the national capital region (Fiestada). The FCS data reveals more about the nutritional contents of the farmers. 6% of farmers in all three provinces experience poor nutritional consumption, 26% experience borderline and 69% experience acceptable. Although the majority of people experience acceptable nutritional consumption there is still more than a third of people who are do not reach acceptable national standards. The numbers are probably larger as the FCS data generalizes the nutritional content of certain foods. For example, processed meats such as hot dogs are given the same weights as fresh meats such as chicken when they do not have the same nutritional content. The national survey revealed some food categories where people were mostly purchasing their food. 72% of farmers purchased their eggs, 41% fruits, 95% fish, 68% meats, and 25% vegetables. These farmers do not have much expendable income so for them to rely so heavily on buying foods in the market is harmful. It will probably be more expensive than if they were to grow the products themselves. The most shocking figure is the 95% of farmers buying their fish. This is an extremely high number, but fish are also an easy competent to implement for famers. In fact, fish used to be part of the rice ecosystem. Rice patties can also serve as a habitat for fish (Hakan). The reason farmers are no longer growing fish with their rice is because the heavy use of fertilizers and pesticides makes the water uninhabitable for the fish. IRRI is trying to push efforts to create a fish-rice dual ecosystem. This way, farmers can have a more varied diet. Although their rice production may decrease because they are not using heavy fertilizers and pesticides, the increased revenue that can be generated from selling fish is predicted to be even more sustainable for farmers. Fish-rice dual ecosystems can also serve as an indicator to the public of an organic farm. Another interesting figure is that only 47% of famers consume pigmented rice. Considering the known

health benefits of pigmented rice, it is important that locals recognize the importance of consuming pigmented rice.

The next step of the project is to do a geographical indicator. We will geo tag and map the areas of the Philippines from which these varieties are from. A geographical indicator will trademark the rice varieties that are from that area. The goal is the protect the native rice varieties from copy cats on the market (Geographical Indications). These copy cats sell illegitimate "heirloom" rice at a much lower price than the actual product and result in the copycat profiting off of people buying their cheaper product. We also hope to put all the heirloom rice varieties in a gene bank to protect genetic diversity. Traditionally, any institution has access to the gene bank. We have already started that process, but many varieties are not stored because the farmers fear that their rice variety will be profited off of by others. To ensure that doesn't happen we are trying to develop a black box. This stores the genetic information but is private for only the farmers who donated the rice. And finally, as stated throughout the paper, the results from the survey can guide future policy about farmers cooperatives, women initiatives and much more.

There are some concerns with the FAO FIES survey. The official survey uses a 12 month recall period, meaning they ask people to recall their experience with food insecurity within a 12-month period (Ballard). A 12 month recall period is problematic for two reasons. First seasonality will play a big factor in how hunger is perceived. An occupation such as farming depend heavily on the farming season. So, if you ask a farmer their perception of hunger right after harvesting season and they have plenty of food, their perception of hunger will be more optimistic. However, if you ask a farmer about their perception of hunger during off season, when they've had to stretch their reserves or when they start running out of food, they will more vividly remember the negative experiences they had. The second problem with a 12-month recall

is that it is too hard to remember all the experiences you've had with food insecurity for a year. For these two reasons some surveys are changing the recall period to last only a month or some even a week. Another problem with the FAO FIES survey is that the survey is meant for adults so does not measure the food insecurity of children.

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Appendices

Informed consent and confidentiality of interviews

Good morning/afternoon, Mr/Mrs _____. We are from the International Rice Research Institute, working for the Heirloom Rice Project together with the Department of Agriculture and PhilRice. The project is now on its second phase and we are now completing a survey among participants to know more about their knowledge, attitudes and practices regarding agricultural pests. The interview will take about **30-45 minutes**. All the information we obtain will remain strictly confidential and your answers and name will never be revealed. Also, you are not obliged to answer any question you do not want to, and you may stop the interview at any time.
The objective of this study **is to evaluate the farmer's knowledge, attitudes, and practices/ perceptions in managing agricultural problems and household food consumption**. This is not to evaluate or criticize you, so please do not feel pressured to give a specific response and do not feel shy if you do not know the answer to a question. I am not expecting you give a specific answer; I would like you to answer questions honestly, telling me about what you know, how you feel, the way you live and how you manage your field. Feel free to answer questions at your own pace.
Do you agree to participate in this interview?
Yes ___ No ___ *If yes, continue to the next question; if no, stop the interview*.
Do you have any question before we start? (*Answer questions*).
May I start now?

GENERAL INFORMATION			
Form No.			
Province	○ Kalinga ○ Mountain Province ○ Ifugao ○ Benguet		
Municipality			
Barangay			
Elevation		GPS coordinates	

Date of interview	
Interviewer	

Socio-demographic questionnaire	
Name of household head	
Sex	○ Male ○ Female
Age/ Birthdate (DD/MM/YYYY)	
Employment status	○ Full-time ○ Part-time ○ Contractual ○ Self-employed ○ None ○ Other: _____
Educational attainment	○ None ○ Primary: _____ ○ Elementary: _____ ○ Secondary (high school): _____ ○ College/University: _____ ○ Vocational: _____ ○ Higher education: _____
Number, gender and age distribution of household members	Male Female 0-2 years [___] [___] 3-17 years [___] [___] 18-59 years [___] [___] 60+ years [___] [___]
Farm area and tenure status	Parcel size of terrace: _____ Area (sq.m.): _____ ○ Owner-operator ○ Leasee / renter ○ Tenant ○ Hired labourer ○ Other (specify): _____
Average farm rice yield per year?	(Kg.): _____
If a member, what organization/ farmer cooperative	

Background information

1. Last cropping season, which rice varieties did you plant? _____

2. What is your source of rice seeds?

- ○ Private seed grower
- ○ Ministry of Agriculture
- ○ Own
- ○ Neighbors
- ○ Other (specify): _____

3. (A) How is rice grown in your field?

- ○ Direct seeding
- ○ Transplanting (specify how many days):

(B) How many crops of rice per year?

- ○ One
- ○ Two

4. What cropping pattern do you follow?

- ○ Rice-fallow (specify # days fallow period): _____
- ○ Rice-rice
- ○ Rice-other crop (specify): _____

5. How do you divide your harvest (in kg) ? *Note: total should equal to average farm yield*

- ○ Household use: _____
- ○ Selling/trading: _____
- ○ Other (specify): _____

Interviewer observation : soil type
- ○ Loam
- ○ Clay-loam
- ○ Clay
- ○ Sandy-loam
- ○ Other: _____

Pest Management Practices

6. In your opinion: list the top five (5) constraints problems? to rice farming:

No. 1 _____

No. 2 _____

No. 3 _____

No. 4 _____

No. 5 _____

7. Please describe the type of pest damage/s does to the rice plant:

No. 1 _____

No. 2 _____

No. 3 _____

No. 4 _____

No. 5 _____

8. For the following questions, I would like to know your management practices. Can you specify the following information:

Pest problem (refer to Question #7)	Current control / management practice	Is it effective? (Yes or No)	Other comments
1.			

2.			
3.			
4.			
5.			

9. Please describe how much do you know about your <u>most important pest</u> in terms of the following:

<u>Physical characteristics</u>

- ○ Color: _____
- ○ Shape: _____
- ○ Size/thickness: _____
- ○ Distinguishing trait: _____

<u>Reproduction</u>

- ○ Eggs/cocoon
- ○ Regeneration
- ○ Other: _____
- ○ I don't know

<u>Location / habitat</u>

- ○ Paddy field
- ○ Terrace walls

- ○ Canals
- ○ Other: _____
- ○ I don't know

Active period

- ○ Morning
- ○ Afternoon
- ○ Nighttime
- ○ Anytime
- ○ I don't know

Abundance/ spatial density

- ○ In paddy fields (specify depth): _____
- ○ In canals
- ○ In rivers
- ○ Other: _____
- ○ I don't know

Active year-round / seasonal abundance

- ○ Yes
- ○ No
- ○ Specific periods / certain months only (specify): _____
- ○ I don't know

Cropping stage most active / peak abundance

- o Before land preparation

- o During land preparation

- o After transplanting

- o Months after planting (specify): ___

- o After harvesting

- o Anytime

- o I don't know

10. What other factor(s) causes the pest population to increase or decrease? (Specific; e.g., weather conditions, soil wetness/water availability, etc.)

_____

11. Presence of earthworms is a big problem during the rice cropping season.

   ○ Agree

   ○ No opinion

   ○ Disagree

12. Are you aware of Integrated Pest Management (IPM) practices?

   ○ Yes

   ○ No

   ○ I don't know

13. Lastly, do you have any other recommendations or suggestions?

_____

Food Security Questions (based on FIES of FAO)
During the last 12 months, was there a time when, because of lack of money or other resources:
1. You were worried you would not have enough food to eat?
2. You were unable to eat healthy and nutritious food?
3. You ate only a few kinds of foods?
4. You had to skip a meal?
5. You ate less than you thought you should?
6. Your household ran out of food?
7. You were hungry but did not eat?
8. You went without eating for a whole day?

8th NNS FORM 1.6 – HOUSEHOLD DIETARY DIVERSITY AND FOOD FREQUENCY

Ask the meal planner of all the foods and drinks served/prepared to the household members for the last 7 days (during the past week) for each food group category. (Note for enumerator: exclude foods eaten outside the home)

1. Ask the meal planner if they **consume** foods belonging under each food group listed below for the last 7 days.

   "Anu-anong pagkain ang hinahanda o nakonsumo ng miyembro ng pamilya nakasali sa bawat grupo ng pagkain nanakalista sa ibaba noong nakaraan 7 araw."

2. Then ask **how many days in the past week** the food item has been served

   "Ilang araw sa nakaraang lingo hinanda o kinain ang pagkain?"

3. Ask what is the **source** of the food item

   "Saan nanggaling o binili ang pagkaing ito?"

Note: If there were two or more food items served under one food group ask what is the food that was served the MOST during the past week

CODE	FOOD GROUP	EXAMPLES	CONSUMPTION CODE 0 - No 1 - Yes	ACTUAL NO. OF DAYS FOOD CONSUMED IN THE PAST WEEK	SOURCE CODE
1	CEREALS AND PRODUCTS	Rice, bread, noodles, biscuits, cookies or any rice and cereal products like biko, suman (malagkit), puto, noodles/pasta, porridge (arrozcaldo, champorado)and others			
2	VITAMIN A RICH VEGETABLES AND TUBERS	carrots, squash, sweet potatoes that are yellow or orange inside			
3	WHITE TUBERS AND ROOTS	white potatoes, potato, cassava, or foods made from roots like French fries, pitsi-pitsi, bibingka, camote cue etc.			
4	DARK LEAFY GREEN VEGETABLES, INCLUDING WILD ONES	dark green, leafy vegetables, such as camote tops, kangkong, malunggay, cassava leaves etc., including wild ones like pako and others			
5	OTHER VEGETABLES INCLUDING WILD VEGETABLES	Eggplant, sitao, ampalaya and other wild vegetables like rattan shoot and others			
6	VITAMIN A RICH FRUITS	ripe mangoes, papayas, guava, melon, passion fruit, dragon fruit and others			
7	OTHER FRUITS, INCLUDING WILD FRUITS	like banana, guyabano, Star apple, chico, atis and wild fruits like sapinit (wild raspberry), bangkoro, bignay and others			
8	MEAT, FRESH AND PROCESSED	fresh like beef, pork, lamb, goat, rabbit, chicken, duck, or other birds, wild game, boar, snake, turtle; processed meat like hotdog, tocino, longanisa and others			
9	ORGAN MEATS (IRON-RICH)	liver, kidney, heart or other organ meats or blood-based foods like dinuguan, isaw (chicken) and others			
10	EGGS	Any eggs, fresh and salted			
11	FISH AND SHELLFISH	Fresh, dried, processed, like sardines, tuyo, tinapa, alamang and others			
12	LEGUMES, NUTS AND SEEDS	beans, peas, lentils, nuts, seeds or foods made from these like pork and beans, guisantes de lata and others			
13	MILK AND MILK PRODUCTS	milk (fresh, canned milk, powder) and products like cheese, yogurt, ice cream, leche flan and others			
14	OILS AND FATS	oil, fats or butter added to food or used for cooking			

*SOURCE CODE
1 – Purchase/bought
2 – Own produce
3 – Not own produced, but hunted, fished, gathered (wild plants and animals)
4 – Borrowed
5 – Exchanged for labor (Food for work)
6 – Barter
7 – Received as gift
8 – Food aid
9 – Given/Free
99 – Not Applicable

**Actual Number of days code
1 – One day
2 – Two days
3 – Three days
4 – Four days
5 – Five days
6 – Six days
7 – Seven Days
9 – Not applicable (No consumption)

	(Continuation......)				
CODE	FOOD GROUP	EXAMPLES	CONSUMPTION CODE 0 - No 1 - Yes	ACTUAL NO. OF DAYS FOOD CONSUMED IN THE PAST WEEK	SOURCE CODE
15	SWEETS	sugar, candies, honey, sweetened soda, sugary foods like chocolates and others			
16	SPICES, CONDIMENTS, BEVERAGES	Pepper, salt, knorr seasoning condiments like vetsin, soy sauce, hot sauce, coffee, tea, alcoholic beverages like Tanduay Emperador, San Miguel product, locally made like basi, tuba, lambanog, vino kulafu and others			
17	Did you or anyone in your household eat anything (meal or snack) OUTSIDE of the home yesterday? (Encircle answer) "May kumain din bang ibang miyembro ng pamilya sa labas kahapon?"		0-No	1-Yes	

FIES survey

During the last 12 months, was there a time when, because of lack of money or other resources:

1. You were worried you would not have enough food to eat?

2. You were unable to eat healthy and nutritious food?

3. You ate only a few kinds of foods?

4. You had to skip a meal?

5. **You ate less than you thought you should?**

6. Your household ran out of food?

7. You were hungry but did not eat?

8. **You went without eating for a whole day?**

FSC survey scale

	Food Items (examples)	Food groups (Definitive)	Weight (Definitive)
1	Rice, bread, noodles, biscuits, cookies or any rice and cereal products *like biko, suman (malagkit), puto, noodles/pasta, porridge (arrozcaldo/champorado) and others* Cassava, potatoes and sweet potatoes, other tubers and plantains	Main Staples	2
2	Beans, peas, lentils, nuts, seeds or foods made from these like pork and beans, guisantes de lata and others	Pulses	3
3	Vegetables, leaves	Vegetables	1
4	Fruits	Fruit	1
5	Beef, goat, poultry, eggs, fish and shellfish	Meat and Fish	4
6	Milk, yogurt and other dairy	Milk	4
7	Sugar and sugar products, honey	Sugar	0.5
8	Oils, fats and butter	Oil	0.5
9	Spices, tea, coffee, salt, fish powder, small amounts of milk for tea	Condiments	0