Innovations

Farmers' Knowledge and Adoption of Good Agricultural Practices in Rice Production

Ciara Mae J. Barreda[1], Maria Loida D. Irabagon[2], Marjorie N. Manlulu[3]
Central Luzon State University, Philippines

Received: 06.08. 2022 **Accepted:** 27.08. 2022 **Published:** 30.08. 2022

Abstract: *The study entitled "Farmers' Knowledge and Adoption of Good Agricultural Practices in Rice Production" determined the level of knowledge and extent of adoption of rice farmers about good agricultural practices (GAP) in rice production and its relationship to farmers' socio-demographic characteristics. The study involved fifty (50) farmers selected thru simple random sampling. Both qualitative and quantitative data were gathered in this study.Pearson correlation was used to test the relationship of variables. Major findings reveal that almost all of the respondents were highly knowledgeable about the said practices. Similarly, almost all of them are regularly adopting the said practices in rice production except for the conduct of soil analysis before land preparation as they found the service expensive. Hence, respondents of the study do not fully practice GAP. Based on the correlation result, farmers' age, educational attainment, years of farming, and annual income were highly significant with the farmers' level of knowledge and extent of adoption of good agricultural practices in rice production. Moreover, the farmers'main and secondary source of agricultural information were their co-farmers and via seminars. Very few identified extension workers as a source of said information. While information, education, and communication (IEC) materials were identified by some as their source of information about the said practices, respondents found those materials ineffective due to the language used and technical words or jargon present in the material. This study recommends that agricultural services like soil analysis should be made affordable if not free among the farmers to enable adopters to fully practice the GAP in rice production. It is also recommended that the IEC materials being used to disseminate information about the said practicesbe tailored fit to the profile of the farmers to make the contents understandable to them. Extension workers play a crucial role in delivering the agricultural technologies in the field as they serve as a walking medium that uses the same language as farmers. This study then suggeststhat theiractivities be intensifiedby regularly visiting the farmers to enable them to address their concerns clearly and promptly. Also, sinceextension workers workclosely with the farmers, extension workers can easily determine and relate to their problems. This would aid in the efficient delivery of agricultural information, thereby, help hasten the full adoption of recommended technologies/practices under GAP.*

Keywords: 1. Adoption 2. Knowledge 3. Rice Production 4. Good Agricultural Practices

Introduction

Rice means life to millions of Filipinos. For them, rice is not merely food but a grain that shapes their way of living, their hopes, and their dreams. They considered rice as a symbolof their quest for life's security and emancipation from hunger(FAO, 2008).

Being the country's staple food, rice has been thewidely grown crop in the Philippines. However, the Philippines lacksa comparative advantage in producing rice due to its geography (Dawe, 2003 & 2006).

According to Dawe (2003), as cited by Bordey (2010),the Philippines' rice production tripled from 1970 to 2008 which increased from 5 million tons to 16 million. The increase however is only 44% due to the problems encountered in the 1980s like tropical storms, droughts, and economic crisis. Until now, the Philippines continue to experience these disasterswhich cause low yield due to the changing climate. Added to these are the farm pests that destroy farm plants which have become more aggressive due to the use of chemical inputs.

Since farmers are one of the most vulnerable sectors in society, they are directly affected by the negative impacts of the changing climate. Without access to the latest technological information about farming,improving their yieldwould become more challenging. They need such information to keep them abreast of the technologies which would help them increase their yield and income.One of these information is the Good Agricultural Practices or GAP.

As explained by Starling (2003),good agricultural practices refer to the practices that address environmental, economic, and social sustainability for on-farm processes.This set of practices results in safe and quality food and non-food agricultural products.It alsoaimstoincrease the production and income of farmers, and improvethe use of natural resources (Poisot, Speedy, & Kueneman, 2004).

Other than boosting farmers' income, GAP primarily makes the products more competitive in the market. This is because people nowadays opt for organically grown farm produce, which is one of the advocacies of GAP.Thus, adopting GAP will be a big help to uplift farmers' economic conditions while protecting the environment and promoting sustainability and healthy living among consumers.

According to FAO (2016), countries like Bangladesh, Bhutan, Maldives, and Nepal have already developed and implemented GAP scheme to ensure the safety and quality of their produce. Asian countries such as Japan, Malaysia, and Thailand now produce GAP-certified products. However, GAP certification in the Philippines is still in the infancy stage, (Banzon, Mojica & Cielo, 2013). As reported by the Business News and Trends Philippines (2022), only 39 farms are GAP-certified in the Philippines despite the millions of farms that are existing in the country. These farms are mostly mango, banana, corn, and root crop plantations that are for export.

Gleaning from the aforementioned scenario, this may imply that the industry for GAP-produced rice in the Philippines is not fully established yet. Some of the interesting factors which may be looked into are the awareness and adoption of the said set of practices rice among farmers.

Objectives of the Study

This study aimed to determine the following objectives:

1. Describe the socio-demographic characteristics of the respondents;
2. Describe the respondent's level of knowledge and rate of adoption of Good Agricultural Practices;

3. Identify the channels/sources of information of the respondents about the GAP in rice production;
4. Determine the relationship between the socio-demographic characteristics of farmers and their level of knowledge and adoption of GAP in rice farming.

Hypothesis

This study attempted to test the following null hypothesis:

1. There is no significant relationship between respondents' socio-demographic characteristics their level of knowledge and the adoption rate of good agricultural practices in rice production.

Review of Related Literature

Good Agricultural Practices or GAP

According to Jain (2015), GAP or good agricultural practices are a set of practices that address environmental, economic, and social sustainability for on-farm processes. When adopted, it results in safe and quality food and non-food agricultural products. It was developed by the food industry, producer organizations, governments, and NGOs aiming to codify agricultural practices at the farm level. The benefits of GAP include food quality and safety improvement; facilitating market access, and reduction in non-compliance risks regarding permitted pesticides and other contamination hazards.

Banzon et al (2013), posits that GAP approaches aim to capture new market advantages by modifying supply chain governance; improving natural resource use, workers' health, and working conditions; and creating new market opportunities for farmers and exporters in developing countries.

In some countries, good agricultural practices (GAPs) programs on crops, livestock, and fishery were launched to enhance the objectives of sustainable agriculture and improve food quality and productivity (Liu, 2003). There is a study that consumer food consumption patterns are changing rapidly because. They are becoming conscious about the food they consume and opt instead to eat food that is nutrient-dense, friendly, and safe for animals and the environment (Rezai, Phuah Kit Teng, Zainalabidin Mohamed, and Mad Nasir Shamsudin, 2011).

Many importing countries including domestic buyers and organized retailers are requiring producers to implement GAP as a prerequisite for procurement. This is to ensure the quality and safety of their produce. This GAP scheme has been developed and implemented in four pilot countries, namely Maldives, Bangladesh, Nepal, and Bhutan, (FAO, 2016). Asian countries such as Japan, Thailand, and Malaysia, have likewise implemented national GAP certification for their commodities. However, GAP certification in the Philippines is still in the infancy stage as claimed by Banzon et.al. (2013), tailing only its Southeast Asian neighbors concerning the adoption of GAP.

Good Agricultural Practices in Rice Production in the Philippines

The Philippine National Standard Code of Agricultural Practices or PhilGAP was harmonized with the ASEAN GAP and GLOBAL GAP. The former has four modules namely: food safety; produce quality; environmental management; and worker health, safety, and welfare. These modules were

adopted by the Philippines as elements of good agricultural practices. While PhilGAP for fruits and vegetable farming, corn and mango production was developed as early as 2007, it was only in 2014 when the PhilGAP for rice was developed by the Department of Agriculture according to the report released by the Bureau of Agriculture and Fisheries Standards (2016).

The code consists of a set of standards that guide the farmers towards sustainable rice production. It describes the farm location, farm environment, irrigation water, soil and soil nutrition, farming practices, workers' health and safety, farm management/farm records, traceability, staff records, and training, that needs to be satisfied to abide by the standards set by the said code.

According to the Philippine Rice Research Institute, Central Luzon or Region III has the most number of GAP-certified farms in the country in 2017 with 83 GAP-certified farms. Out of the said figures, 61 are found in Nueva Ecija. Given that Nueva Ecija holds the highest record of having GAP-certified farms, it is very interesting then to study how many of the farmers in the selected study site know about GAP and how many of them have adopted the said practices as well as to what extent.

Adoption of Good Agricultural Practices in Rice Production

Based on the existing literature, studies concerning the knowledge and adoption of farmers regarding GAP on rice production are very limited, particularly in the Philippines. While such studies are present, still, the focus is different from what this study wants to explore.

One of these studies includes the study of Banzon et al (2013) who looked into the numerous constraints to GAP adoption. Based on their study, the major constraints can be summarized into four categories, namely: (1) knowledge constraints, (2) cost constraints, (3) process constraints, and (4) reward/incentive constraints. The study also explained why adoption is slow. The reasons behind this include the lack of awareness of GAP among the various stakeholders and the associated costs of compliance and certification which are relatively high for both corporate and small farms.

Glover (2010) on the other hand has also enumerated some factors which may limit farmers' adoption of GAP. These include finance and time, which influence farmers to try new technologies, especially if such considerations involve external inputs that are expensive or difficult to obtain. Recent studies in Madagascar have also shown slow adoption and high dis-adoption rates. Moser and Barrett (2003) have attributed this to the methods of adoption which requires additional knowledge and more labor.

Moreover, the study conducted by Pandit et. al. (2016) which is closely similar to the interest of this study focused on the adoption of good agricultural practices in Basmati rice in the two districts of north India, namely: Karnal and Kurukshetra. Results of the study revealed that the awareness level of farmers about good agricultural practices in basmati rice was 58.33% whereas the adoption was only 27.41%. However, the study noted that the benefits of adoption were well understood by the farmers and the preparedness for adoption was 65.67%. The results are contradictory since awareness is high and adoption is low. Respondents claimed to be prepared for the adoption. With these, the study claimed that the farmers posed potential challenges in the form of ill-preparedness for the adoption of GAP in basmati rice. Moreover, the relationship of independent variables was also looked into in this study if there is a correlation with adoption. It showed that education and mass media exposure have a high correlation with the adoption of GAP while social participation and land holding have positively correlated with the adoption of GAP's criterion.

This result is somewhat parallel to J.M. Mkanthama's (2013) study which claimed that farmers who were older than 35 years were more likely to adopt GAP than younger ones. The study

also found that adopters who were more educated were more likely to adopt GAP than those who were less educated.

Other factors such as lack of knowledge highly affect the adoption of organic farming in rural areas. Even though that is the case, farmers tend to adopt a change once someone they know successfully integrates the adoption into his/her farm that is the only time the majority will invest in a certain technology, (Matsumoto, Yamano, & Sserunkumma, 2013).

Additionally, the study of Srisopaporn et. al. (2015) in Thailand about the adoption and continued participation in a public Good Agricultural Practices program revealed that the adoption and non-adoption of the 250 respondents surveyed are highly related to household labor constraints, land ownership, and initial high expectations regarding the market opportunities of the GAP produced rice. These factors are also present in the aforementioned studies.

Research Methodology

A combination of qualitative and quantitative collecting data was utilized in this study. A quantitative approach for the numerical data and a qualitative approach for verbatim in support of the numerical data.

Since the study used simple random sampling, the researcher obtained the list of farmers in the research area and selected 50 of them using draw lots to identify the respondents.

A survey questionnaire was utilized to gather the data from the respondents. Descriptive statistics and Pearson correlation was applied for quantitative data and to test the relationship of the dependent and independent variables, respectively.

Results and Discussion

Socio-demographic and farm characteristics of respondents

The results showed that the majority (74%) of the respondents are males and only 12% were females. The majority of them (46%) belong to the age group of 46-60 years old while 59 is the mean age of the respondents. This confirms the statistics presented by Asis (2020) which says that the average age of Filipino farmers is 57-59 years old, which means that most Filipino farmers are middle-aged.

In terms of educational attainment, a big portion of the respondents were high school graduates (34%) and the least of them had no formal education (2%). More than half (54%) of the respondents have more than six years of farming experience. The biggest portion of respondents (38%) earn an average of P35,000.00 to P40,000.00 annually (Table 1). This data only reveals that Filipino farmers still live below the poverty line as a monthly income of P12,082.00 is required to cover the expenses of a family consisting of five (5) members (PSA, 2021).

Table 1.Socio-demographic characteristics of the respondents

Profile	Frequency	Percentages
	n=50	%
Sex		
Male	37	74.00
Female	6	12.00
Age		
45 years old and below	6	12.00
46-60 years old	23	46.00
61-75 years old	11	22.00
more than 75 years old	8	16.00
Mean	58.75	
SD	12.98	
Min	28	
Max	85	
Highest Educational Attainment		
No formal education	1	2.00
Elem Undergrad	7	14.00
Elem Graduate	11	22.00
High school Undergrad	6	12.00
High School Graduate	17	34.00
College Undergrad	8	16.00
College Graduate	0	0.00
Years in farming		
2	3	6.00
3	4	8.00
4	2	4.00
5	14	28.00
6	27	54.00
Mean	5.16	
SD	1.2	
Annual Income		
20,000-25,000	3	6.00
25,001-28,000	1	2.00
28,001-30,000	1	2.00
30,001-35,000	10	20.00
35,001-40,000	19	38.00
40,001 and above	14	28.00

With regards to the awareness of respondents on good agricultural practices in rice production, 66% said that they are aware or already heard about the GAP while 34% haven't heard about it. Those who have heard about GAP said that most (34%) of them heard it from the seminars they attended (Table 2).

Table 2. Respondent's awareness of Good Agricultural Practices

Particular	Frequency	Percentages
	n=50	%
Aware or Heard about GAP		
Yes	33	66.00
No	17	34.00
Source of information		
Television	6	6.18
Interpersonal	4	4.12
Seminar	34	35.70
Co-farmers	39	40.20
Extension Workers	1	2.06
Neighbor	3	3.09
Leaflet	6	8.33
Flyers	3	3.09
Pamphlet	1	2.06

In terms of respondents' knowledge about good agricultural practices, almost all of them are highly aware of the said practices. Results revealed that all of the practices were always being adopted by the respondents except the soil analysis and identification of water sources for the farm operation. The irregular adoption of these two specific practices may be due to the socio-economic condition of the respondents as it requires additional expenses.

Knowledge and Adoption of Respondents about the Good Agricultural Practices

In terms of the knowledge about good agricultural practices, the data displayed a consistent result which reflects that almost all of the respondents have high knowledge of good agricultural practices, to wit: farm location, environment, structure and facilities, irrigated rice ecosystems, planting, and seed material, pesticide and other agro-chemical, integrated pest management, weed management, water management, harvesting practices, transport and storage and worker's health and safety.

Table 3. Overall mean and descriptive rating of farmers' knowledge on GAP

Practices	Knowledge Level On Gap	
	mean	Overall rating
Farm Location	1.14	High
Farm environment	1.30	High
Farm structure and facility	1.02	High

Irrigated rice ecosystem	1.06	High
Planting and Seed Material	1.18	High
Pesticide and other Agro chemical	1.02	High
Integrated pest management	1.04	High
Weed management	1.10	High
Water management	1.00	High
Harvesting practices	1.00	High
Transport and storage	1.02	High
Workers health and safety	1.02	High
Note: 1-1.74 “high”, 1.75-2.49 “moderate”, 2.50-3.24 “slightly aware”, 3.25-4.00 “somehow aware”		

For the respondents' rate of adoption, almost all of the respondents are always adopting the said practices. However, two specific practices were not always adopted by the respondents. These were soil analysis that should be done before land preparation and the identification of the water source. The non-adoption of these two practices may be due to their socioeconomic condition as soil analysis requires certain fees. The other one is the identification of water sources. Farmers in the Philippines only rely on irrigation water, water pump, and rain which makes their source of water limited. Thus, it can be said that the respondents are not fully adopting the recommended practices under GAP. Instead, they modify the said practices based on the availability of their resources-monetary and access to facilities and affordability of inputs.

Table 4. Overall mean and descriptive rating of farmers’ adoption of GAP

Practices	Adoption Level On Gap	
	Mean	Overall rating
Farm Location	1.68	Always
Farm environment	1.78	Sometimes
Farm structure and facility	1.14	Always
Irrigated rice ecosystem	1.06	Always
Planting and Seed Material	1.54	Always
Pesticide and other Agro chemical	1.10	Always
Integrated pest management	1.06	Always
Weed management	1.10	Always
Water management	1.04	Always
Harvesting practices	1.08	Always
Transport and storage	1.38	Always
Workers health and safety	1.02	Always
Note: 1-1.74 “always”, 1.75-2.49 “sometimes”, 2.50-3.24 “often”, 3.25-4.00 “never”		

Respondents’sources of information about Good Agricultural Practices in Rice Production

Results revealed that the primary source of information for the respondents is their co-farmers (40.20%). This was followed by seminars (34%). Although few of them mentioned that they receive printed information, education, and communication materials like leaflets, flyers, and pamphlets, respondents admitted that they do not pay much attention to reading the said materials

as they contain jargon or technical words which are difficult for them to understand. The materials are also written in English which is difficult for them to understand since they find it difficult to speak and understand given their educational background.

They also admitted that they are eager to attend seminars as the language used in the activity is Tagalog, which is their mother tongue. This may support the result that their co-farmers are their primary source of information about good agricultural practices, as communication among their group is easy for them as they use a similar language, thereby promoting a better understanding of technologies (Table 3). This result is similar to the findings of Mittal and Tripathi (2009) who found out that their top source of information is their co-farmers, particularly, the progressive ones. Furthermore, they regarded extension workers (2.06%) as one of the least sources of information. The result is also congruent to the findings of Yaseen, Xu, and Hassan (2016) which also revealed that only a few farmers regarded agricultural extension workers as their source of agricultural information.

Table 5. Respondents' channels/sources of information about the GAP in rice production.

Type	Frequency	Percentages
	n=97	%
Co-farmers	39	40.20
Seminar	34	35.70
Leaflet	6	8.33
Television	6	6.18
Interpersonal	4	4.12
Flyers	3	3.09
Neighbor	3	3.09
Extension Workers	1	2.06
Pamphlet	1	2.06
Note: Multiple answers		

Relationship between socio-demographic characteristics and level of knowledge on GAP

Association between the farmers' socio-demographic characteristics and level of knowledge on good agricultural practices showed that the farmers' age is significantly related to the level of knowledge in irrigated rice ecosystem and integrated pest management. Moreover, farmers' educational attainment is also associated with their level of knowledge in practices in the farm environment and weed management. Also, years in farming are associated with the level of knowledge on practices in irrigated rice ecosystem. Lastly, farmers' annual income is related to their level of knowledge in the practices of planting and seed materials. It also shows that farmers' awareness of GAP is significantly related to the level of adoption in the farming practices by their farm location.

Table 6. Relationship of the farmers' socio-demographic profiles to their level of knowledge of Gap

Practices	Profile				
	Sex	Age	Highest Educational Attainment	Years in farming	Annual Income
Farm Location	0.917	5.265	4.312	0.573	3.085
Farm environment	2.113	8.021	23.562	3.704	10.024
Farm structure and facility	0.166	1.110	1.981	1.198	3.881
Irrigated rice ecosystem	0.523	10.764**	5.789	2.719	1.612
Planting and Seed Material	0.737	6.136	5.929	1.916	17.045
Pesticide and other Agro chemical	0.166	1.110	1.981	0.869	1.559
Integrated pest management	0.166	10.435**	4.004	1.775	5.068
Weed management	0.340	6.528	21.479**	0.877	10.603
Water management	n/a	n/a	n/a	n/a	n/a
Harvesting practices	n/a	n/a	n/a	n/a	n/a
Transport and storage	0.166	1.110	3.618	0.869	10.024
Workers health and safety	0.166	3.435	3.618	1.198	1.559
Note: *significant at 10% level (p<0.10). **significant at 5% level (p<0.05).					

Relationship of the farmers' socio-demographic profiles to their level of adoption on GAP

In terms of the relationship of the farmers' socio-demographic profiles to their level of adoption of GAP, the result showed that age has a relationship to farm structure, irrigated rice ecosystem, and water management with a significant level of 5%. On the other hand, the highest educational attainment is significantly related to weed management and harvesting practices and annual income is related to integrated pest management, water management, and harvesting practices. Atibioke, Ogunlade, Abiodun, Ogundele, Omadara, and Ade (2012) also had similar findings in their research, wherein the level of education was seen as an important factor in the adoption of agricultural technologies.

Table 7. Relationship of the farmers' socio-demographic profiles to their level of adoption on Gap

Practices	Profile				
	Sex	Age	Highest Educational Attainment	Years in farming	Annual Income
Farm Location	1.118	9.700	24.516	0.485	13.62
Farm environment	2.719	5.644	5.323	1.691	8.205
Farm structure and facility	1.131	14.863**	4.718	2.587	9.228
Irrigated rice ecosystem	0.437	10.488**	6.013	2.827	1.514
Planting and Seed Material	1.505	1.561	7.864	0.412	8.529
Pesticide and other Agro	0.917	5.438	2.115	0.081	10.453

chemical					
Integrated pest management	1.009	2.437	1.895	0.238	15.984**
Weed management	0.340	6.528	21.479**	0.877	10.603
Water management	0.350	10.183**	3.886	1.699	24.745**
Harvesting practices	0.350	4.981	12.511**	1.699	31.304**
Transport and storage	15.931**	8.529	9.706	6.919	9.906
Workers health and safety	0.166	3.344	3.517	0.903	1.559
Note: *significant at 10% level (p<0.10). **significant at 5% level (p<0.05).					

Conclusion

Drawing on the results of this study, respondents were highly knowledgeable about the good agricultural practices in rice production. Almost all of these practices were adopted regularly by the respondents except the two particular practices which are the conduct of soil analysis before the start of land preparation and the identification of water sources which they do not regularly practice. The non-adoption of these two practices may be attributed to the socio-economic condition of the farmers as soil analysis requires certain fees to be conducted. Also, if in case the soil acidity or ph level of their farm's soil is high, it will require them to put organic fertilizer which requires an additional cost to their farm expenses. Farmers also have a very limited source of water, thus, the identification of water source was not regularly adopted or practiced by the respondents. Farmers in the Philippines only rely on three water sources-irrigation water, water pump, and rain, which makes their source of water limited. Thus, it can be said that the respondents are not fully adopting the recommended practices under GAP. Instead, they modify the said practices based on the availability of their resources-monetary and access to facilities and affordability of inputs.

This study also highlighted the role of interpersonal communication and mass communication as effective channels of communication. It is because their co-farmers and seminars are the primary and secondary sources of information, respectively. As revealed by the respondents during the interview, they preferred attending seminars as they are very much familiar with the language being used in the activity. The dynamics of the activity also allow them to interact with technical experts and allows them to ask questions and seek technical assistance directly concerning their farm-related problems.

The network of communication among farmers was also highlighted in the result of this study since the respondents' co-farmers are their primary source of information about good agricultural practices. This means that communication between farmers are very active and it shows that other than the experts who shares or presents the technology in the seminars they attended, they considered their co-farmers as one of their credible source of information. While few respondents enumerated some printed information, education, and communication as their source of information about GAP, some admitted that the contents of the said materials contain jargon or technical words which are hard for them to understand. In addition to this is the language used in the said medium as it is not written in the language not popular to them. Thus, these materials for them were ineffective as a means of disseminating information about good agricultural practices in rice production.

While this study hypothesized that respondents' socio-demographic characteristics have no significant relationship to their level of knowledge and adoption, the result of the study proved that

the said variables indeed have a relationship. As mentioned in the results, the age of the respondents, educational attainment, years in farming, and income has a significant relationship with the knowledge of respondents about GAP while age, educational attainment, and annual income are the variables that have a significant relationship to the respondents' adoption of the said practices. This study then was able to reject its hypothesis.

Recommendations

Based on the result and conclusions drawn, this study recommends the following:

1. Agricultural services like soil analysis should be made affordable if not free among the farmers to enable adopters to fully practice the recommended practices under GAP in rice production. Since farmers are low-income earners, this service should be subsidized if not made free. If certain institutions aim to encourage farmers to fully adopt GAP, services similar to soil analysis should be accessible and affordable to farmers.

2. This study has proven that attending seminars for farmers generates a positive result as it helps them obtain new knowledge and information about agricultural technologies. Thus, it is recommended for them to continue educating themselves by attending seminars that introduce the latest agricultural information and technology.

3. Conducting seminars for farmers about agricultural information had given a positive impact on farmers as it equipped them with said information. Thus, it is recommended that the conduct of such activities and other related undertakings be sustained and continued by concerned agencies.

4. Since the study revealed that the printed information, education, and communication materials being distributed to the respondents carrying agricultural information are ineffective due to the jargon or technical words they contain and the language used to present the information, it is recommended that the said materials be repackaged to ensure that the contents are understood by them.Also, since this study found out that few farmers had no formal education and did not even finish elementary, they should consider this a very important factor in designing the communication strategies to promote good agricultural practices and other technologies that will be promoted among them in the future. They should use the language that is familiar to the farmers to make the knowledge transfer effective. In addition to the familiarity with the language, relatability on how the technology was presented should also be applied. The messages and delivery should be tailored-fit to the profile of the farmers to help them understand what is being presented.

5. It was also reflected in the study that very few identified extension workers were identified by respondents as the source of information about good agricultural practices. While research and development institutions are already conducting seminars to address the agricultural information needs of the respondents, it would also be better if extension workers will regularly visit the farmers as well as intensify their extension activities so that their farming concerns would be addressed clearly and promptly. Extension workers play a crucial role in delivering the agricultural technologies in the field as they serve as a walking

medium that uses the same language as farmers. They possess the traits that farmers prefer to a medium-delivers the message in an understandable manner and can relate to their farm problems. Since extension workers are knowledgeable about said technologies and farm management, farmers will be able to relate to them, thereby, the delivery of information will be effective. By doing such, they may convince farmers to have their soil analyzed, thereby improving the condition of their farm soil and generating a positive result. Thus, fully adopt the recommended practices under GAP.

6. It is also recommended that a similar study be conducted in other barangays or municipalities to verify/compare the result of this undertaking as this study was conducted only in one barangay in the Science City of Munoz, Nueva Ecija, Philippines. Thus, samples are limited and do not represent the whole population of the area.

References

1. *A. N. Siriwardana and L.N.A.C. Jayawardena. 2014. Socio-Demographic Factors Contributing to the Productivity in Paddy Farming: A Case Study*
2. *Amekawa Yuichiro. 2009. Reflection on the Growing Influence of Good Agricultural Practices in the Global South*
3. *Agnes, C. and Rola, S. (2002). Do farmer field school graduates retain and share what they learn? An investigation in Iloilo, Philippines. Journal of International Agricultural and Extension Education, 9(1), 65-76*
4. *Atibioke, O.A., (2012). Effects of farmers' demographic factors on the adoption of grain storage technologies developed by Nigerian stored products research institute (NSPRI): A case study of selected villages in IlorinWest LGA of Kwara State, Research on Humanities and Social Sciences, 2(6),56-63.*
5. *Banzon, Mojica & Cielo. 2013. Adoption of Good Agricultural Practices (GAP) in the Philippines: Challenges, issues, and policy imperatives*
6. *Banzon & Mojica. 2019. Adoption of Good Agricultural Practices (GAP): How does the Philippines fare?*
7. *Everette M. Rogers. 1995. Attributes of Innovations and their rate of Adoption. Flordeliza Bordey. 2011. The impacts of research on Philippine rice production F. Bordey, P. Moya, J. Beltran, & D. Dawe. 2016. Competitiveness of Philippine Rice in Asia*
8. *Glover, D., 2010. The System of Rice Intensification: Time for an empirical turn. NJAS – Wageningen Journal of Life Sciences, 57, pp:217–224. Retrived from erepository.uonbi.ac.ke*
9. *Joseph Mphatso Mkanthama. 2013. An Analysis of Use of Good Agricultural Practices in Rice Production: A Case Study of Bagamoyo and Dakawa Areas, Tanzania.*
10. *Low, L., 2000. Economics of information technology and the media Singapore: [PaperPresented at the Seventh International LL in E.]*

11. *Moser, C.M. & Barrett, C.B. 2002. The disappointing adoption dynamics of a Yield increasing, low external-input technology: the case of SRI in Madagascar. Agricultural Systems, 76, pp: 1085–1100.*
12. *Poisot, Speedy, & Kueneman. 2004. Good Agricultural Practices – a working concept*
13. *Revised A.O. – Administrative Circular No. 10 (series of 2013) Guidelines on the certification of GAP for Crops*
14. *Rezai, Phuah Kit Teng, Zainalabidin Mohamed and Mad Nasir Shamsudin, 2011. Consumers' awareness and consumption intention towards green foods*
15. *Rao, Wasserman. Global media ethics revisited: A postcolonial critique 2007. Global media and communication*
16. *Santiago, Palazida. Overview of the Philippine Good Agricultural Practrices (PhilGAP)*
17. *Sikandar Azam. The Influence of Socio-Demographic Factors in adopting Organic Farming Practices*
18. *Truong Thi Ngoc Chi1 and Ryuichi Yamad. 2002. Factors affecting farmers' adoption of technologies in farming system: A case study in OMon district, Can Tho province, Mekong Delta*
19. *Wijekoon, W.M.N.D., and Jayawardena, L.N.A.C., (2010). Utilization of sources of Information for decision making of farmers – A Case Study, Peradeniya University Annual Research Sessions-2010, University of Peradeniya, Sri Lanka.*
20. *Mittal, S. and Tripathi, G. 2009. Role of Mobile Phone Technology in Improving Small Farm Productivity. Retrieved from www.researchgate.net*
21. *Yaseen, Xu and Hassan. 2016. Farmers' Access to Agricultural Information Sources: Evidences from Rural Pakistan. 2016. Retrieved from https:www.scirp.org*
22. *Philippine Statistics Authority. 2021. Proportion of Poor Filipinos Registered at 23.7 Percent in the First Semester of 2021. Retrieved from psa.gov.ph*
23. *Pandit, Nain, Singh, Kumar. 2017. Adoption of Good Agricultural Practices (GAPs) in Basmati (Scented) rice: A study of prospects and retrospect. Retrieved from www.researchgate.net*
24. *Atibioke, Ogunlade, Abiodun, Ogundele, Omadara, Ade. 2012. Effects of Farmers' Demographic Factors on the Adoption of Grain Storage Technologies Developed by Nigerian Stored Products Research Institute (NSPRI): A case study of selected villages in Ilorin West LGA of Kwara State. Retrieved from core.ac.uk*

Corresponding author & Email:
Ciara Mae J. Barreda & ciaramaebarreda@gmail.com[1]
Maria Loida D. Irabagon & mldirabagon@clsu.edu.ph[2]
Marjorie N. Manlulu & marjoriemanlulu@clsu.edu.ph[3]