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Assessment of Lowland Rice-based Organic Farming in Selected Municipalities of Occidental Mindoro, Philippines

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ABSTRACT

This study aimed to assess lowland rice-based organic farming system in selected municipalities of Occidental Mindoro, Philippines. It was conducted in Magsaysay, San Jose and Sablayan, Occidental Mindoro, Philippines from June 2016 up to March 2017. This study employed descriptive method of research utilizing pre-constructed questionnaire administered to 133 farmer-respondents using an interview schedule. Key informant interviews, focus group discussion and observation were also utilized to gather data. Descriptive statistics, as well as costs and returns analysis were used to present the results. Results showed that lowland rice-based organic farmers are old, predominantly male and literate. They have an average household size, with long farming experience, in general but with short engagement to organic farming practices. Farmers are owners of their farm land and affiliated to organizations, and had experience availing credit. They have high awareness on organic agriculture, while farmers have moderate adoption of it. Lowland rice-based organic farms are less productive but more profitable as compared to conventional farms. Farmers encountered problems in production, certification and marketing aspects of organic agriculture.

Keywords:
certification; farming system; organic agriculture; profitability

1. Introduction

Agriculture remains an integral part of inclusive development as it is 2-4 times more effective in poverty reduction compared to other sectors of the economy. In the Philippines, agriculture still plays a very significant role in the country's economy (Ponce, 2004). GDP from agriculture sector for the second quarter of 2016 amounted to PhP 135 million (Trading Economics, 2018) employing 33 percent of the country's labor force (National Organic Agriculture Board, 2012).

One of the major agricultural commodities in the Philippines is rice. As stated by Department of Agriculture (DA), rice is a food staple – an economic commodity (Gumapac, 2011). It is both a major expenditure item and a source of income for many Filipino households. Yet, the current practices or conventional practices in agriculture are causing numerous problems such as soil and water pollution, greenhouse gas emissions, and biodiversity reduction (Asian Development Bank, 2015). Food safety is also becoming an issue in agriculture, along with food security.

Based on the International Federation of Organic Agriculture Movement (IFOAM, 2016), organic agriculture was seen as a solution to the above mentioned problems. Organic production and domestic markets have established themselves throughout the Asian region; however, domestic organic sectors may be small in some areas, governments are still encouraging and supporting organic agriculture.

The signing of Republic Act No. 10068, otherwise known as the Philippine Organic Agriculture Act on April 06, 2010 paved the way for intensification and promulgation of organic agriculture in the country. Department of Agriculture (2016) mentioned that there is also an increasing trend in organic agriculture from 2011 to 2016 with 8,980 farmer-practitioners and 14,140 hectares (NOAP) to 116,558 organic farmer-practitioners and 343,387 hectares of organic farm lands. The production also increased from 12,988 mt to 442,510 mt in a span of four years (2011-2015). The Office of the Provincial Agriculturist (2017) of Occidental Mindoro mentioned that as of 2017, the number of organic practitioners was estimated to be around 645 farmers, with a total land area of 1,270.97ha converted for organic agriculture. Among the products cultivated are organic rice, corn, assorted vegetables, root crops and tubers.

This study aimed to assess lowland rice-based organic farming system in selected municipalities of Occidental Mindoro, Philippines. This also attempted to document the initiatives of farmers in the area towards organic agriculture. It also captured the problems they often encountered upon their adoption.

2. Materials and Method

This study employed descriptive method of research in assessing the lowland rice-based organic farms in selected municipalities of Occidental Mindoro**.** It utilized both primary (interviews from the farmers, agricultural technicians, Municipal Agriculture Officers, barangay officials and officers of various cooperatives) and secondary sources of information.

Furthermore, in assessing the adoption level to organic agriculture of lowland-rice based farmers, this study followed the Philippine National Standards Specification (PNSS) for Organic Agriculture (Crop Production). However, minimal revisions were made to fit the objectives of this study and to include only that is of utmost important. The PNSS was initially prepared by Organic Certification Center of the Philippines (OCCP) and was adopted by Department of Agriculture through the Bureau of Agriculture and Fisheries Product Standards (BAFPS).

The primary respondents for this study were the lowland rice-based farmers adopting organic farming practices for at least three years in the municipalities of Sablayan, San Jose and Magsaysay in the province of Occidental Mindoro, Philippines. Barangay officials, officers of various associations/organizations, and MAO personnel in the selected areas were also interviewed for the triangulation method.

For this study, stratified random sampling was employed. Three purposively selected municipalities of Magsaysay, San Jose and Sablayan served as the strata of this study. According to the data from the Office of the Provincial Agriculturist, these municipalities have the largest area allotted for organic agriculture. List of farmers practicing organic agriculture was requested from respective municipalities. Since the population of three municipalities did not exceed 500, 35 percent from each strata was determined as the sample size. Next step was the simple random sampling of lowland

rice farmers among the three municipalities. A total of 133 lowland rice farmers were interviewed for this study.

In analysing and presenting the data, descriptive statistics was used in this study. Costs and returns analysis was also used to determine the profitability of the farms. Respondents were asked to assess their awareness level on the six areas by rating 1 (no), 2 (moderate) and 3 (yes). Results were consolidated using weighted mean and 3-point likert scale. On the other hand, to analyse the adoption level of farmers, respondents were asked to rate their adoption in the nine areas of organic agriculture for crop production as follows: 1 – never; 2 – seldom; 3 – sometimes; 4 – often; 5 – always. Results were consolidated using 5-point likert scale.

3. Results and Discussion

3.1. Characteristics of Lowland Rice-Based Farmers

Table 1 presents the characteristics of lowland rice-based farmers adopting organic farming practices in selected municipalities of Occidental Mindoro. Table 1 shows that, the mean age of farmers is approximately 50.34 years old, while the range is 27-77 years old, with a standard deviation of 12.27, which means older people are engaged in organic rice-based farming in Occidental Mindoro. This coincides with the age bracket of organic farmers in Central Luzon ranging from 48 to 52 years old (Truc, Sumalde, Espaldon, Pacardo, Rapera & Palis, 2012). It also shows that farming in Occidental Mindoro is dominated by male as they are expected to perform farming duties for the family. Truc, et al. (2012) and Yamota and Tan-Cruz (2007) also revealed the same result. Rice farmers in the province of Occidental Mindoro are literate and capable of basic numeracy and reading skills. This can influence their level of understanding and perception as to the advantages of shifting from conventional farming to adopting organic farming practices and eventually, organic agriculture.

Furthermore, the mean household size is approximately five members, with a range of 1-10 and standard deviation of 1.84, which can be considered very small to big household. In a traditional Filipino farming family, members also assist in the farm works. Farmers have long farming experience with an average of 23.59 years. The average length of adoption is 4.78 years, with a range of 1-10 years and a standard deviation of 3.05 years. The passing of Organic Agriculture Act in 2010 (R.A. 10068) paved the way for a stronger promotion and advocacy for a more sustainable agricultural practices. However, some of the interviewed respondents were already adopting organic farming practices even before the passing of R.A. 10068. According to Department of Agriculture's statistics (2016), there are already 43,470 organic practitioners in the Philippines, from 8,980 in 2011. This also resulted to increase in total land area devoted for organic farming as well as an increase in production.

Many (67%) of the rice farmers own the land that they are cultivating while 33 percent are renting. This implies that farmers have the responsibility to adopt the best and most advantageous farming practices for them, in this case, organic farming practices. Farmers have less motivation to adopt organic agriculture if they are renting the land since they cannot maximize the benefits that they can derive from it (Brown, Rosario & Aganon, 2015).

Result also showed that most (88%) farmers availed credit to supplement the capital required of their farming activity. Among the sources of credit of the farmers are

cooperatives, rural bank and relatives. Some farmer-respondents who are also officers of their respective cooperatives explained that government banks, such as Land Bank of the Philippines provide loans to cooperatives which are availed by the members at a minimal interest rate. This scheme makes credit more accessible to farmers by cutting through the tedious requirements and paperwork of a more formal lending institution.

Table 1. Characteristics of lowland rice-based farmers adopting organic farming practices

Characteristics	Frequency (n=133)	Percentage
Age		
20-30	8	6
31-40	8	6
41-50	67	50
51-60	30	23
61-70	16	12
71-80	4	3
Mean: 50.34 years old		
Range: 27-77 years old		
SD: 12.27		
Sex		
Male	98	74
Female	35	26
Educational Attainment		
Elementary undergraduate	1	1
Elementary graduate	20	15
High school undergraduate	49	37
High school graduate	38	29
College undergraduate	9	7
College graduate	15	11
Others (Vocational courses)	1	1
Household size		
2 and below	24	18
3-5	75	56
6-8	23	17
9 and above	11	8
Mean: 4.83		
Table I. (continued).		
Range: 1 - 10		
SD: 1.84		
Farming experience		
10 and below	16	12
11-20	32	24
21-30	62	47
31-40	15	11
40 and above	8	6
Mean: 23.59		
Range: 3 - 49		
SD: 13.20		
Years engaged in organic farming		
1-3	70	53
4-6	40	30
7-9	16	12
10 and above	7	5
Mean: 4.78		
Range: 1 - 10		
SD: 3.05		
Land tenure status		
Owner	89	67
Tenant	44	33
Credit Availment		
Yes	117	86
No	18	14
Organizational Affiliation		
Affiliated	133	100

One of the strong points of Occidental Mindoro as an organic agriculture advocate is the establishment of Organico Mindoreños, an organization for those farmers engaged in or practicing organic agriculture, both in provincial and municipal level. It aims to intensify information dissemination, and promotion and adoption of organic agriculture in the province and across all 11 municipalities. Collective initiative and effort of farmers also contribute to the promotion of organic agriculture in Occidental Mindoro. These organizations and associations are also sources of farmer's information in farming, particularly those practices towards full adoption to organic agriculture along with other government agencies. Some farmers are also updating their knowledge with books and magazines.

3.2. Awareness of Lowland Rice-Based Farmers on Organic Agriculture

To assess the awareness level of lowland rice-based farmers on organic agriculture, respondents were asked to consider the following areas: seeds, fertilizer and pesticide to use, organic fertilizer and pesticide production as well as the marketing practices, based on the study conducted by Piadozo, Lantican, Pabuayon, Quicoy, Suyat and Maghirang (2014).

Table 2 shows the awareness of lowland rice-based farmers in selected municipalities of Occidental Mindoro in organic agriculture. It can be seen from the table that farmers have a high level (2.54) of awareness on organic agriculture, particularly on what seeds (2.75), fertilizer (2.70), and pesticide (2.77) to use, as well as in organic fertilizer (2.47), and organic pesticide (2.35) production, but farmers have moderate (2.22) level of awareness on marketing practices of organic rice.

Organic farming is not just merely application of organic inputs. It is a technical process which involves complexities starting from preparation of inputs at own farms up to following the proper procedures in marketing organically produced products (Brown, Del Rosario & Aganon, 2015). These standards should be maintained to ensure the quality and integrity of the products which is one of the main concerns of organic agriculture. Thus, in order to fully adopt, farmers should understand all the underlying concepts, processes, preparation and post-practices of organic agriculture.

Table 2. Awareness level of lowland rice-based farmers in organic agriculture

Aspects of organic agriculture	Weighted mean	Interpretation
Seeds to use	2.75	High
Fertilizer to use	2.70	High
Pesticide to use	2.77	High
Organic fertilizer production	2.47	High
Organic pesticide production	2.35	High
Marketing practices	2.22	Moderate
Overall Weighted Mean	2.54	High

3-point rating scale for awareness level: 1.00-1.66 – Low; 1.67-2.33 – Moderate; 2.34-3.00 – High

Moreover, lowland rice-based farmers are affiliated to various organizations and associations which are instrumental in accessing information which helped improved their knowledge and increased their level of awareness on various aspects of organic agriculture through seminars, trainings and capability buildings given by different agencies. This is reflected by their adopted organic farming practices.

3.3. Adoption of Lowland Rice-Based Farmers in Organic Agriculture

Table 3 presents the adoption level of organic rice-based farmers in organic agriculture in Occidental Mindoro. It shows a moderate level of adoption of farmers to organic agriculture with an overall weighted mean of 2.98. Farmers have very low level of adoption in diversity in crop production (1.71) but have moderate level of adoption in the choice of crops to use (2.62), crop rotation and soil management practices (2.79), commercial production of organic fertilizer (2.7), pests, diseases and weed management (2.86), pollution control (3.3) and soil and water conservation (3.4). On the other hand, farmers have high level of adoption in fertilization policy (3.66) and use of growth regulators (3.82).

Table 3. Adoption level of lowland rice-based farmers in various areas of organic agriculture

Areas of adoption	Weighted mean	Interpretation
Choice of crops to use	2.62	Moderate
Crop rotation and soil management practices	2.79	Moderate
Fertilization policy	3.66	High
Commercial production of organic fertilizer	2.7	Moderate
Pests, diseases and weed management	2.86	Moderate
Growth regulators	3.82	High
Pollution control	3.3	Moderate
Soil and water conservation	3.4	Moderate
Diversity in crop production	1.71	Very Low
Overall Weighted Mean	**2.98**	**Moderate**

5-point rating scale for adoption level:1.00-1.80 – Very low; 1.81-2.60 – Low; 2.61-3.40 – Moderate; 3.41-4.20 – High; 4.21-5.00 – Very high

Farmers are knowledgeable about the organic inputs that should be utilized in their rice fields. Majority are also producing their own inputs like fermented fruit and plant juices, fertilizer and other botanical pesticides and insecticides. However, due to limited agricultural resources, farmers cannot fully adhere to the requirements of organic agriculture. Farmers in Occidental Mindoro also practiced monocropping; hence, diversification of their farm field is not their priority.

3.4. Productivity and Profitability of Lowland Rice-Based Organic Farms and Conventional Farms

Table 4 shows the costs and returns analysis of one hectare lowland rice adopting organic practices and conventional practices in selected municipalities of Occidental Mindoro. Mendoza (2002) emphasized that productivity and profitability continue to be the two most important indicators in assessing the success or failure of crop production.

Table 4. Costs and returns analysis of one hectare lowland rice adopting organic practices and conventional farms

Items	Organic farm	Conventional Farm
Returns		
Yield (*cavan*)	90	130
Non Cash returns		
Home consumption (*cavan*)	25	20
Cash returns		
Sales		
Quantity in cavan (50kg/*cavan*)	65	110
Price* (PhP/kg)	55.00	32.00
Gross income (PhP**)**	**178,750.00**	**176,000.00**
Costs		
Fertilizer and pesticides	10,476.00	14,012.00
Seed	5,890.00	9,986.00
Input labor	2,004.00	7,610.00
Hired labor	10,450.00	8,956.00
Other expenses	768.00	1,570.00
Total costs (PhP**)**	**29,588.00**	**42,134.00**
Net Income (PhP**)**	**149,162.00**	**133,866.00**

**retail price*

Based on the result, conventional farms had lower cash returns but incurred higher expenses, while organic farms had higher cash returns and incurred lower expenses. Net income for one hectare lowland rice of conventional farms amounted to approximately PhP 133,866.00, while PhP 149,162.00 for organic farms, which is 10.25 percent higher as compared to the conventional farms. This contradicts the study conducted in Nueva Ecija, Philippines wherein organic farms have lower net income compared with conventional farm (Brown, Del Rosario & Aganon, 2015). Economic benefits on the use of organic fertilizer as perceived by farmers in Cagayan Valley lowers farm input costs leading to higher profit (Benabise & Banciles, 2012). This was also the case with the farmers in the province of Occidental Mindoro, Philippines.

3.5. Problems Encountered of Lowland Rice-Based Farmers in Adopting Organic Agriculture

Table 5 shows the different problems encountered of lowland rice-based farmers in adopting organic agriculture in selected municipalities of Occidental Mindoro. It shows that among their top five problems encountered are indifferent price level (70%) for organically produced palay and conventionally grown palay, lack of market outlet (70%), difficult and expensive certification process (64%), insensitivity of nearby farms (51%), and insufficient supply/unavailability of organic inputs (50%).

Studies suggest that organically grown products command a higher price in the market if they are certified and labelled as organically produce. Since, lowland rice-based farms of Occidental Mindoro is not yet certified to be 100% organic, they cannot expect that their output can be bought at higher price. Consumers pay for the integrity and quality of the products that they are buying. Furthermore, since their product is not yet

certified, they are having difficulty in finding a niche market where they could take advantage of even a small increment in the price of their produce.

Table 5. Problems encountered of lowland rice-based organic farmers adopting organic farming practices

Problems encountered*	Frequency (n=133)	Percentage
Indifferent price level	93	69.92
Lack of market outlet	89	66.92
Difficult and expensive certification process	85	63.91
Insensitivity of nearby farms	68	51.13
Insufficient supply/inavailability of organic inputs	67	50.38
Increasing cost of organic input preparation	48	36.09
Decline yield/production	45	33.83
Laborious preparation	41	30.83
Presence of weeds and pests	34	25.56
Inavailability of raw materials for organic input preparation	26	19.55
Delayed irrigation	25	18.80

**multiple response*

One of the major challenges faced by small farmers converting to organic agriculture is the certification process. Farmers found it very expensive and difficult to comply with. Even though they are aware that only upon the certification of their farms can they take advantage of the economic benefits of organic agriculture, they cannot afford the expenses and the tedious process of certification. In the study of Piadozo, Lantican, Pabuayon, and Nocon-Shimoguchi (2016), small-scale farmers cannot afford to have their farms certified by a third party because of their small volume of production and low income.

According to the OCCP web portal, there is a separate certification process for individual farmers and for small holder group. Group certification entails more documentary requirements as compared for individual. The inspection path for the farm certification is as follows: environment, contamination, fields, brought in materials, production system, harvest, storage and processing, documentation and sales. Typical duration from inspection to certification is 3-6 months, while validity of certification is 18 months with a certification cost amounting to a minimum of PhP 15,000.00 (Philippine Organic Information Network, u.d.). Moreover, National Organic Agriculture Program also allows third party certification. This is conducted by trained inspectors from among farmers and additional accredited certifying bodies. Second party certification or Participatory Guarantee System (PGS) is a system by which the group or its members do certification using their own standards and inspection systems (National Organic Agriculture Board, 2012).

4. Conclusion

This study has the following conclusions: Lowland rice-based organic farmers are old, predominantly male and literate. They have an average household size, with long farming experience, in general but with short engagement to organic farming practices. Farmers are owners of farm land and affiliated to organizations, and had availed credit. Lowland rice-based farmers have high awareness on organic agriculture, but with they are moderate adopting it. Lowland rice-based organic farms are less productive, but are more profitable compared with conventional farms. The most common problems encountered of lowland rice-based farmers adopting organic practices are in production, certification and marketing aspects of organic agriculture.

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