

## FARMERS' PERCEPTIONS ON ORGANIC RICE PRODUCTION AREAS IN THREE REGIONS OF MINDANAO, PHILIPPINES

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### Abstract

This study investigates the motivations, challenges, and adoption rates of organic rice farming in Regions 9, 10, and 12 of Mindanao. The research focuses on how farmers' perspectives impact organic farming practices in an ideal ecosystem. Using a multistage sampling technique, data was collected through interviews and structured questionnaires, analyzed with descriptive statistics. Findings show that most organic rice farmers are mature, male, married, and have a high school education. Challenges like pest control, market access, and early investment are prevalent, but the potential for higher premiums and environmental benefits increases interest in organic farming.

**Keywords:** Perceptions, Organic Rice Farmer, Mindanao Region, Farm Profiles, Organic Farming Practices.

### INTRODUCTION

Organic rice production in the fertile agricultural regions of Mindanao is gaining increasing prominence as a sustainable and environmentally friendly method of cultivating one of the country's staple crops. This approach aligns with the growing global demand for organically grown products and the desire to conserve and improve soil quality, ensuring long-term agricultural productivity.

Organic rice production in Mindanao is marked by a commitment to reducing chemical inputs, enhancing biodiversity, and promoting soil health, benefiting farmers and the environment. Often referred to as the "food basket of the Philippines," Mindanao plays a crucial role in ensuring food security, adding more laborers to assist with clearing land, planting, and harvesting.

The region's fertile soils and favorable climate conditions make it an ideal location for rice cultivation. However, conventional farming practices have led to issues such as soil degradation, loss of biodiversity, and negative environmental impacts due to excessive chemical use. In response to these challenges, adopting organic rice production practices becomes a necessity and a sustainable path toward a healthier and more resilient agricultural system. Sustainable food production with minimal or no environmental impact is the main objective of organic farming practices.

Given that organic farming can address current agricultural challenges and facilitate the sustainable production of high-quality food, it is imperative to advocate for organic farming in the study region. Conventional farming has not successfully accomplished this objective, which has necessitated the addition of more laborers for land clearing, planting, and harvesting.

Despite the threats to sustainable agricultural production posed by continued inorganic farming practices, as well as the potential for environmental degradation and climate change, farmers continue to produce primarily inorganically. To effectively advance organic agriculture for sustainable development, it's crucial to gain insights into farmers' perspectives.

Consumer interest in organic products is largely shaped by the belief that these foods are safer and more beneficial for health, the environment, and the well-being of farmers and society at large. While health and environmental concerns are the primary motivations for transitioning to organic farming, economic factors tend to play a lesser role (Barrot et al., 2018).

RA 10068 aims to promote, propagate, develop, and implement the practice of organic agriculture in the Philippines. Implementing organic agricultural programs, projects, and activities focused on the farmers and other stakeholders, establishing facilities, equipment, and processing plants to accelerate the production and commercialization of organic fertilizers, pesticides, herbicides, and other appropriate farm inputs (GOVPH, 2010).

Adoption intention may be influenced by farm and farmer factors (such as education and agricultural experience). This factor has been employed in earlier research, with notable results. For example, Liu et al. (2019) and Tiwari et al. (2008) found that the adoption of soil testing technology was significantly predicted by the characteristics of farmers.

Additionally, Digal and Placencia (2018) have demonstrated that important factors influencing farmers' decisions to switch to organic farming in the Philippines included gender, education level, and size of farm. Thus, the adoption purpose was explained in terms of the farm and the farmer.

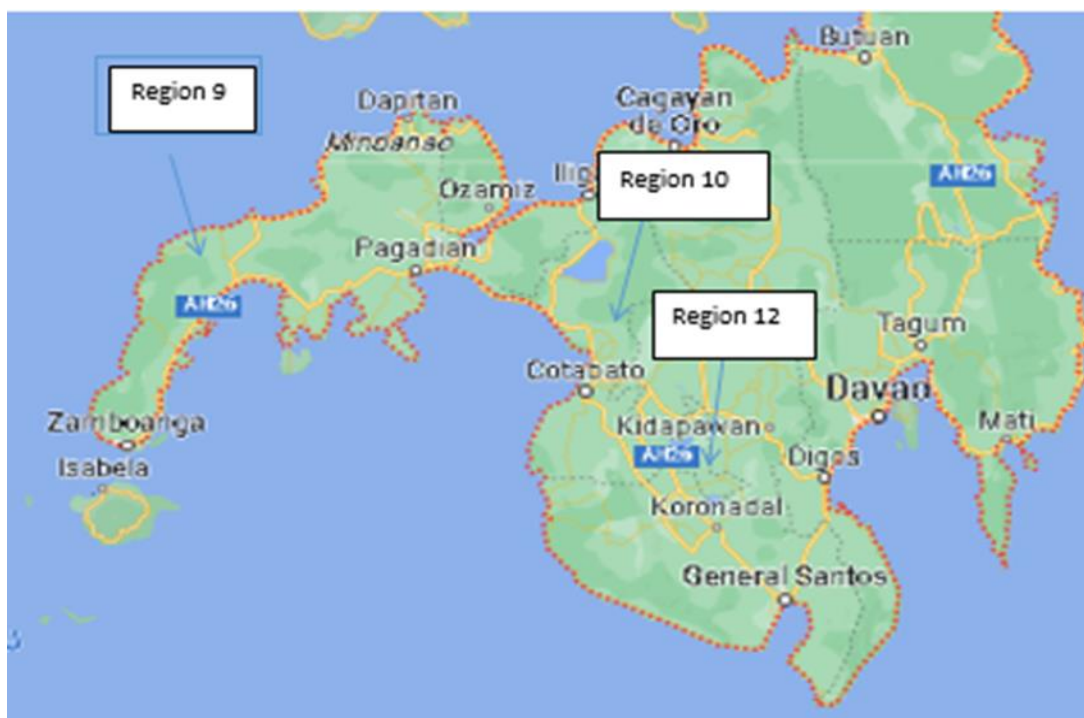
Previous research has demonstrated that attributes related to production and management (such as credit, training accessibility, and input source) can influence adoption intention. The socio-demographic and farm characteristics of the rice farmers included age, gender, civil status, educational profile, ethnicity, land tenurial status, number of years in organic rice farming, farm size, marketing of products, and training attended.

The government should support farmers in continuing to plant organic rice, provide technical assistance, and build institutions for processing and marketing organic rice to boost the profitability of organic rice farming (Susilowati et al., 2024). This study aims to explore the farmers' perception of organic rice production areas in three regions of Mindanao, their farming practices, and how this practice influences their lives.

## RESEARCH METHODOLOGY

This study was conducted from April to August 2024. The study was conducted purposively in three rice-producing regions in Mindanao. These were Region 9 - Zamboanga del Sur, Region 10 - Bukidnon, and Region 12 - North Cotabato, where most organic rice farming areas are located. Zamboanga del Sur is a province in the Zamboanga Peninsula with a latitude of 7°44'59.28" and a longitude of 123°19'37.20" East.

The latitude of Valencia City, Bukidnon, is 7°54'13.79" North, and the longitude is 125°05'23.40" East. President Roxas, a first-class municipality in North Cotabato, has a latitude of 7°09'14.40" North and a longitude of 125°03'21.60" East. This study was conducted from April to August 2024.



**Figure 1: Map of Mindanao**

The population involved in this study consisted of organic rice farmers. A multistage stratified sampling technique was used for this study because of the several stages that were involved in selecting respondents. The first stage involved the selection of regions, where Region 9, 10, and 12 were purposively selected for this study because of their well-known status as organic rice-producing areas.

The second stage involved the selection of farmers based on the lists from the Department of Agriculture. The third stage is followed by a selection of farmers per cluster, those farmers who engaged in organic rice growing from 1-5 years, 6-10 years, 11-15 years, 16-10 years, and 20 years and above. The focus group discussion (FGD) and key informant interview (FII) were also conducted.

The interview using a guided questionnaire was done per region. Nineteen farmers were selected from Region 9, twenty-eight from Region 10, and twenty-two from Region 12 to make a total of 69 respondents, which constituted the sample size for the study. Before the survey was conducted, a permit to conduct the study was secured from the concerned authority to facilitate proper coordination. An adapted and improved questionnaire from Nelson et al., (2019) was administered to gather the needed data for the study.

Collection and data analysis were done by collecting from the primary sources (respondents) with the aid of a structured interview consisting of both open and closed-ended questions. The data collected were analyzed with the aid of the descriptive statistical tools of frequency count, percentage, and mean for the Likert scale. Regression and correlation analysis was also used to determine the relationship between the socio-demographics and the perceptions of the organic rice farmers.

## RESULTS AND DISCUSSION

### a. Farmers and farm profiles

The sociodemographic and farm characteristics of the respondents examined in this study include age, gender, marital status, educational attainment, ethnicity, land tenure status, number of years in organic farming, size of organic farm, product marketing, and attended trainings. These factors are pertinent to people's perceptions of organic farming. Table 3 presents the sociodemographic of the respondents, the majority of respondents (Region 10) are between the ages of 52 and 60 years old, while the mean age of respondents in Regions 9 and 12 is 62.73 years old. This supports Solomon's (2008) findings that the average age of farmers was 51 years. Samarpatha et al. (2016) found that the average age of rice farmers in Nigeria, Malaysia, and Sri Lanka, is 48, 52.9, and 53.56 years old respectively. These findings suggest that older farmers are more likely than younger ones to

**Table 3: Socio-demographic and farm characteristics of organic farmers related per region**

Characteristics	Region 9 Zamboanga del Sur		Region10 Bukidnon		Region 12 North Cotabato	
	F(n=19)	%	F(n=28)	%	F(n=22)	%
Age group						
34-42	1	5.20	1	3.5	1	4.54
43-51	0	0	2	7.14	1	4.54
52-60	7	36.84	11	39.29	2	9.09
61-69	8	42.11	5	17.86	13	59.09
70-79	2	10.53	5	17.86	2	9.09
80-87	1	5.26	4	14.29	3	13.64
Gender						
Male	13	68.42	20	71.43	14	63.64
Female	6	31.58	8	28.57	8	36.36
Civil status						
Single	2	10.53	3	10.71	2	9.09
Married	15	78.95	17	60.71	15	68.18
Widow/Widower	2	10.53	7	25.0	5	22.73
Separated	0	0	1	3.57	0	0
Educational Attainment						
Elementary Level	4	21.05	9	32.14	7	31.82
High School Level	5	26.32	7	25.00	6	27.27
College Level	10	52.63	11	39.29	9	40.91
Graduate Level	0	0	1	3.57	0	0
Ethnicity						

Subanen	1	5.26	0	0	0	0
Muslim	0	0	0	0	0	0
Visayan	3	94.74	18	64.29	21	95.45
Others	0	0	10	35.70	1	4.55
Land Tenurial Status						
Owner	17	89.47	25	89.29	19	86.36
Renter	1	5.26	0	0	1	4.55
Tenant	1	5.26	3	10.71	2	9.09

engage in organic farming practices. The findings indicate that young people are largely absent from organic farming. Consequently, older farmers may struggle with the physical demands of labor-intensive tasks in this sector. Moreover, the adoption of innovative practices in organic farming tends to be lower than anticipated, potentially decreasing with age (Ogunyemi, 2005). The data shows that most respondents are male, indicating that farming in this region is primarily a male-dominated activity, as noted by Dipeolu et al. (2006) and Solomon (2008). Older farmers often perform well in rice farming due to their accumulated experience and traditional knowledge.

The data from Table 3 indicates that most farmers are married, with only a small number being single, separated, or widowed. This suggests that married individuals are likely more engaged in farming and may receive support from their spouses in various farm activities. In terms of educational attainment, 80.6% of respondents have attained a college level across all three regions, while only a few have completed primary or secondary education. This trend points to the involvement of educated individuals in farming, aligning with Solomon's (2008) observation that many modern farmers possess formal education. High literacy rates among respondents may facilitate the adoption of innovations in organic farming.

In terms of ethnicity, the majority of the three regions belong to the Visayan group, one Subanen (5.26%) from Region 9, and another group of 35.71% (Region 10) and 4.55% (Region 12). This result implies that the Visayan group is inclined to do rice farming since they are also the majority, consuming rice as their main staple food aside from corn. However, for land tenurial status most of them owned their farmland for regions 9, 10, and 12 (89.47%, 82.14%, and 86.36%), respectively, while only a few renters and tenants of the farm.

This result is consistent with the research by Gomez and Octavio, which found that the majority of Claveria's sweet potato growers possessed 0.25 to 1 hectares of total land, while the least amount was 3.25 to 4 hectares. In addition, for the number of years in organic rice farming, regions 9 and 12 have the greatest number of farmers engaged in 20 years and above, while regions 10, 1–5 years, have the highest number of practitioners.

This suggests that in two regions 9 and 12, these farmers were the first to adopt technology and are still actively involved in its use, whereas in region 10, there were more recent users of the technology. The majority of farm's area planted to organic rice falls between 0.25 to 1.87 hectares. Which is usually intended for family consumption, and in bigger areas it is sold commercially in the cooperative or in the market.

Continuation of Table 3.....

Characteristics	Region 9 Zamboanga del Sur		Region10 Bukidnon		Region 12 North Cotabato	
	F(n=19)	%	F(n=28)	%	F(n=22)	%
Number of years in organic farming						
1-5	0	0	10	35.71	2	9.09
6-10	4	21.05	3	10.71	3	13.64
11-15	4	21.05	5	17.86	3	13.64
16-20	4	21.05	3	10.71	3	13.64
21-above	7	36.84	6	21.43	10	45.45
Organic farm size						
0.25-1.00	14	73.68	17	60.71	13	59.09
1.25-2.00	4	41.05	7	25.00	4	18.18
2.25-3.00	1	5.25	0	0	0	0
3.25-4.00	0	0	0	0	0	0
4.25-5.00	0	0	3	10.71	1	4.55
>5.00	0	0	1	3.57	1	4.55
Marketing of products						
For consumption only	0	0	10	35.71	2	9.09
For consumption and commercial purposes	19	100	18	64.29	20	90.91
Training Attended						
Organic Farming	18	94.74	19	67.86	20	90.91
Vermiculture/vermicomposting	16	84.21	15	53.57	15	68.18
Concoction	15	78.95	12	42.86	18	81.82
Organic crops-related	16	84.21	15	53.57	18	81.82

Most organic rice farmer they market their products over home consumption. Farmers' training is very important for the farm to be productive. Most of the farmers attended different training and seminars related to organic farming, vermicomposting, making of concoctions, and organic crop-related seminars to enhance their knowledge and skills.

### b. Farming practices

Farming practices employed by organic rice farmers per region are shown in Table 4. In terms of the nature of labor used, most farmers in three regions hired additional labor during land preparation, planting, and harvesting. However, for the fertilizer used on their farm, vermicompost/compost is the most common organic input they applied followed by plant waste and animal manure. Solely Region 10 employs various techniques for pest management, such as trapping, insect predators, and biological control agents; Region 9 does not use these techniques, while Region 12 solely uses biological techniques.

In addition, organic farmers tend to use other farming practices like the use of wood vinegar (Liquid smoke) as fertilizer and pesticides at the same time. Additional methods include the following: HP, Panyawan, Sandiya, Sili, Malathion tree extract, Charcoal, Hagonoy, and water management for weed control. Oriental herb nutrient (OHN), LOP, FPR, FMDC, Fermented plant juice (FPJ), Fermented fruit juice (FFJ), and fermented extract of Hagonoy + Asunting + Madre de cacao (HAM).

**Table 4: Farming practices employed by the organic rice farmers per region**

Organic Farming Practices	Region 9 (n=19)		Region 10 (n=28)		Region 12 (n=22)	
Nature of Labor Used						
Family Labor	0	0	10	35.71	2	9.09
Hired Labor	19	100	18	64.29	20	90.91
Fertilizer Used						
Compost/Vermicompost	15	78.95	19	67.86	15	68.18
Plant Waste	4	21.05	9	32.14	0	0
Green Manure	0	0	8	28.57	0	0
Animal Manure	2	10.53	10	35.71	5	22.72
Kitchen Waste	1	5.26	7	25.00	0	0
Pest Management						
Trap methods	0	0	5	17.86	0	0
Insect predators	0	0	8	28.57	0	0
Biological control	0	0	7	25.00	3	13.40
Other farming practices (please specify)	OHN HAM LOP FPR FMDC PANYAWAN VINEGAR WATER MNGT HAGONOY	OHN CHARCOAL FPJ, FFJ PANYAWAN SILI MALATHION TREE SANDIYA HP MDC				

**c. Perception of rice farmers on organic rice farming**

Farmer perception of organic rice farming for three regions in Mindanao is shown in Table 6. Respondents from all three regions "agree" that "the growing number of organic farmers in their community encourages the pursuit of organic farming," and "the values and beliefs of my farming community are

**Table 5: Perception of rice farmers on organic rice farming by region**

Perception	Region 9	Region 10	Region 12
1. The increasing number of organic farmers in my community encourages the pursuit OF	4.28(A)	4.12(A)	3.86(A)
2. OF values are agreeable to the values and beliefs of my farming community.	3.94(A)	4.19(A)	3.80(A)
3. Converting to an OF system is exciting.	4.78(SA)	4.27(A)	4.55(SA)
4. Converting to an OF system is challenging.	4.22(A)	4.46(SA)	4.60(SA)
5. People living in rural areas prefer organic farm products to non-organic	4.06(A)	4.12(A)	3.45(A)
6. OF is effective in increasing the texture and fertility of the soil	4.89(SA)	4.35(A)	4.95(SA)
7. OF can increase the income of farmers	4.61(SA)	4.08(A)	4.60(SA)
8. Farmers who are engaged in OF are highly regarded.	4.39(A)	4.04(A)	4.45(SA)
9. Organic products are safe to consume	4.83(SA)	4.96(SA)	5.00(SA)
10. OF leads to an economically progressive nation	4.78(SA)	4.11(A)	4.35(A)
11. All farmers should practice OF because it is more profitable than conventional farming.	4.11(A)	4.46(SA)	4.30(A)

12. Organic agriculture provides an opportunity for farmers to produce diversified products.	4.72(SA)	4.39(A)	4.75(SA)
13. The number of organic farmers will increase due to popular demand.	4.00(A)	4.08(A)	3.80(A)
14. There is a demand for organic agricultural products.	4.28 (A)	4.08(A)	4.25(A)
15. Consumers prefer organic agricultural products.	4.06(A)	3.89 (A)	4.10(A)
16. OF contributes to health improvement due to less use of pesticides and insecticides	4.72(SA)	4.58(SA)	4.85(SA)
<b>Mean</b>	<b>4.59(SA)</b>	<b>4.24(A)</b>	<b>4.35(A)</b>

Adapted: Nelson et al., 2019

Legend:

4.50-5.00

Strongly agree

3.50-4.49 Agree

2.50-3.49 Neutral

1.50-2.49 Disagree

1.00-1.49 Strongly disagree

in line with organic farming values." However, farmers in Region 9 "strongly agree" and "agree," while farmers in Region 10 "agree" and "strongly agree" that "converting to an organic farming system is exciting and challenging. Moreover, "People in rural areas prefer organic farm products to non-organic" All respondents for three regions "agree" to this statement. On the other hand, respondents from Region 9 and 12 "strongly agree" and Region 10 "agree" that "organic farming is effective in increasing the texture and fertility of the soil" and "OF can increase the income of the farmers".

According to the survey, respondents from Regions 9 and 10 "agree" and Region 12 "strongly agree" that "farmers who are engaged in OF are highly regarded." On the statement "Organic products are safe to consume," all responders from three regions "strongly agree," and on the statement "OF leads to an economically progressive nation," they "agree" and "strongly agree" (Regions 9 and 12).

Respondents "strongly agree" (region 10) and "agree" (region 9 and 12 that "All farmers should practice OF because it is more profitable than conventional farming". Also, organic agriculture provides an opportunity for farmers to produce diversified products. In Region 9 and 12, they 'strongly agree' with this statement, while farmers in Region 10 simply 'agree.'

Additionally, all respondents from all three regions agreed that "the number of organic farmers will increase due to popular demand" and that "there is a demand for organic agricultural products" and "consumers prefer organic agricultural products" were true. However, when it came to the statement that "organic farming contributes to health improvement due to less/no use of pesticides and insecticides," all respondents from all three regions expressed "strong agreement."



Table 6 shows whether the demographic profile of the respondents per region shows a significant difference. The civil status and ethnicity of the respondents for the three regions showed a significant difference, with computed F values of 13.273 and 9.472, respectively. On the other hand, age, gender, and educational attainment shows no significant difference among them. This result implies that, regardless of the variables mentioned above, organic rice farmers from the three regions belong to similar age ranges; the majority of them are male and have completed high school education.

**d. Demographic profile of the respondents**

**Table 6: Significant differences in the demographic profiles of respondents across the three regions**

Variables	Computed F	p-value
Age	0.178	0.837
Gender	0.124	0.884
Civil status	13.273**	.00001
Educational attainment	0.385	0.681
Ethnicity	9.427**	0.0002

\*\* highly significant \*\*p<=0.01

**e. The effect of demographic profiles on the perceptions of respondents regarding organic farming in three regions of Mindanao**

The relationship of the farmers' demographic profile and their perception of organic rice production technology in three regions is shown in Table 7 below. Farmers' perception is related to their age in Region 10 (Bukidnon) only with the values (r=0.035, p=0.05), which means that the older the farmers are, the more knowledgeable they are based on their length of experience in organic rice farming. While the rest of the variables show no relationship with what the farmers perceived.

**Table 7: Relationship of the demographic profile and perceptions of the respondents per region**

Variables	Region 9	Region 10	Region 12
Age	0.3339	0.0305*	0.7274
Gender	0.8057	0.8892	0.5234
Civil Status	0.7007	0.7498	0.6736
Educ. Attainment	0.1485	0.3764	0.4208
Ethnicity	0.4018	0.1949	0.9839

\*Correlation is significant, \*p<= 0.05

Pearson coefficient: interpretation <0.2 very weak linear; 0.2- <0.4 weak linear; 0.4-<0.6 moderate linear, 0.6-<0.8 strong linear; 0.8-0.99 very strong linear; 1 perfect linear

Table 8 displays the R2 values from the regression study of the rice farmers' perceptions of organic rice cultivation and their demographic profile. Aside from the ages in Region 10, which account for 17.38%, the correlation analysis reveals significant findings.

All the values from the various variables are lower across the three regions. This finding suggests that respondents' ages in region 10 have a major impact on how they perceive information about and adoption of organic rice growing.

**Table 8: Regression analysis of the influence of respondents' demographic profile on their perceptions of organic rice farming in the three regions of Mindanao**

Variables	Region 9	Region 10	Region12
Age	0.0550	0.1738	0.0062
Gender	0.0037	0.0008	0.0207
Civil Status	0.0089	0.0041	0.0091
Educ. Attainment	0.1187	0.0314	0.0327
Ethnicity	0.0417	0.0663	0.0000

## CONCLUSION

The organic rice farmers from the three regions in Mindanao are mostly mature individuals, male, married, belong to the Visayan group, and have completed high school. They attended a variety of lectures and training on organic farming.

Extra produce that is not consumed by the family is sold to nearby businesses and organic markets. They hire more workers for the seasons of planting, harvesting, and land preparation.

The most common organic inputs applied to their farms are compost/vermicompost, animal manure, and plant residue. For pest control, most of the farmers use wood vinegar, HAM, OHN, FPJ, FFP, and malathion trees.

Ethnicity and civil status are significant, according to ANOVA results. Furthermore, age is significant in region 10 and related to farmers' attitudes, according to correlation and regression analyses.

It is strongly advised, in light of the aforementioned findings, that the organic rice farmers in the three regions receive varying degrees of training and assistance from our government, particularly in the way they market their goods.

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## Declaration of Interest Statement

We, EDNA F. DENUBO and MRYNA G. PABIONA, hereby disclosed that we have no financial or personal conflicts of interest related to this research. We have no affiliations, financial interests, or personal relationships that could be perceived as influencing the outcome of this study. Our research and findings are conducted with impartiality and integrity, with the sole aim of contributing to the advancement of knowledge in the field. Any support or funding received for this study has been disclosed in the acknowledgements section of the research,

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