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Informing Organic Agriculture Policy in the Philippines through Local Farmers' Knowledge, Attitudes, and Practices (KAP)

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Abstract

The study generally aims to design a policy framework that aims to leverage support of organic agriculture among local government units and communities in the SOCCSKSARGEN Region, Philippines for ecologically sound and sustainable community development. The study is descriptive-policy research that employed survey design to ascertain the knowledge, attitude, and practices of 300 farmers in five municipalities in Region XII, Philippines comprising Kidapawan City in Cotabato Province, Lake Sebu in South Cotabato, Palimbang in Sultan Kudarat, Maitum in Sarangani, and General Santos City. Purposive sampling was used in the identification of respondents while balanced selection was utilized in the determination of equal number of respondents in every municipality. The data were collected using adapted survey questionnaires and analyzed using mean. Results revealed that farmers' knowledge, attitude, and practices (KAP) toward organic farming were generally low, with poor practices largely reflecting limited knowledge and attitudes. Further, it can be gleaned in the data that their knowledge about organic farming is relatively higher than their attitude and practices of it, respectively. The findings of the study bridge the empirical and population gaps about the knowledge, attitude, and practices (KAP) toward organic farming of local farmers in the southernmost part of the Philippines which Filipino scholars and agricultural practitioners may use as a theoretical basis in constructing and measuring KAP toward organic farming. The study also designed a policy framework that local government units may use as a keystone in implementing programs and projects that will promote engagement in organic agriculture for a more environmentally friendly, safe, and sustainable Philippine agriculture.

Keywords: Attitude, farmers' practices, knowledge, organic farming, policy framework

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1. Introduction

In the 21st century, environmental issues such as climate change have become increasingly prevalent worldwide [1]. The National Economic and Development Authority (2021) has identified the Philippines as a vulnerable country to climate-related hazards, including tropical cyclones, floods, droughts, and sea-level rise [2]. In response to the escalating concerns about climate change, there is a growing recognition of the urgent need for effective strategies to address this pressing global challenge.

Meanwhile, agriculture remains as one of the leading sources of land degradation in the environment [3], which is manifested by the loss of soil fertility due to over-cultivation. For the last 20 to 30 years, farmers in the Philippines have been practicing chemical-based agricultural production strategies that can poison soil and greatly contribute to land degradation [4]. Given that organic farming remains limited to certain regions of the Philippines despite extensive government efforts, it is imperative to address the pressing issue of land degradation in the country and consider alternative solutions to various social, economic, and environmental agricultural challenges.

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Organic agriculture has emerged as a promising avenue for mitigating climate change due to its potential to reduce greenhouse gas emissions, promote carbon sequestration in soils, and conserve biodiversity [5]. In the early 1980s, the concept of organic agriculture began to gain traction, with the International Federation of Organic Agriculture Movements (IFOAM) defining it as a production system that places a premium on the preservation of soil health, ecosystems, and human welfare. Commonly, organic farming is perceived as an agricultural approach that promote social, environmental, and economic sustainability, alongside animal welfare considerations [6]. This approach entails minimizing reliance on external resources, optimizing the utilization of locally-derived renewable resources, adeptly managing agro-ecosystems, and incorporating market mechanisms to internalize external costs.

Organic agriculture encompasses three core dimensions, namely social, economic, and environmental aspects, that can contribute to providing solutions to pressing agricultural concerns. In the social dimension, organic agriculture demands more intensive labor and presents the potential to bolster long-term employment opportunities in rural regions. Its emphasis on hiring seasonal workers coupled with the rising demand for organic produce underscores its significance in rural employment. Moreover, organic farming fosters entrepreneurship and mitigates migration from rural areas, thereby facilitating the inclusion of diverse societal groups in agricultural pursuits and fostering employment growth. Furthermore, organic farming respects and integrates indigenous and traditional knowledge into its practices, thereby augmenting social resilience and empowering farmers and local communities, aligning with the overarching goal of addressing concerns in the agriculture sphere.

In the economic dimension, organic farming stands out as a financially wise choice for farmers, as it eliminates the need for costly chemical inputs. By opting for inexpensive methods like biological resources instead of chemical fertilizers and pesticides, organic farmers effectively reduce their operational expenses while maintaining sustainable agricultural practices [7]. Organic farming leverages local resources instead of depleting capital-intensive inputs, enabling economically disadvantaged farmers to enhance productivity and soil fertility without relying on costly external resources. There are a large number of economic opportunities that lead to the increase of added value of organic products through processing and marketing activities and the improvement of economic stability for farmers in the long run.

In terms of environment protection and conservation, organic farming serves as a catalyst for enhancing soil quality, ensuring the sustainability of farms, and safeguarding the environment. The cultivation of fertile soil under organic practices fosters stability and efficiency within the production cycle [8]. Moreover, enriching the soil with nutrients reduces erosion and enhances biodiversity, thus fortifying long-term food security. Additionally, in organic farming with minimum tillage, biological fertilizers, proper crop rotation and cover crops, green manure, etc., an increase in soil fertility occurs. Organic farming posts as a solution to various environmental problems by reducing soil erosion and protecting water resources at the same time maintaining and improving environmental services.

The Philippines, recognized for its heavy dependence on agriculture [9], embraces organic agriculture through the adoption of Republic Act No. 10068, commonly known as the "Organic Agriculture Act of 2010," spearheaded by the Department of Agriculture (DA). This legislative approach was motivated by the dual objectives of fostering ecologically sustainable farming methods and enhancing the economic viability of agricultural production. Consequently, the establishment of the National Organic Agriculture Program (NOAP) provided a structured framework for the implementation of organic agriculture initiatives within the Philippines [10].

Despite its growth, organic agriculture in the Philippines continues to account for only a modest portion of cultivated land. Against the national target of 5% conversion from 2012 to 2016, only about 107,911 hectares had been shifted to organic farming, even as the number of organic farmers increased significantly,

indicating uneven adoption [11]. Meanwhile, tangible premiums in consumer prices and strong returns for farmers highlight considerable economic potential: locally, organic herb producers achieved a return on investment of up to 127% (i.e., ₱1.27 earned per ₱1 invested), and organic carrot farmers saw net returns between ₱5,450 to ₱32,000 per hectare depending on farm size—a clear indicator that organic farming can boost farmer income [12]. These findings underscore the urgency of rigorous demand-side studies to quantify consumers' willingness to pay for green products, along with supply-side on-farm trials comparing income and health outcomes under organic versus conventional methods.

Given its abundant natural resources, SOCCSKSARGEN Region maintains a strong reputation in terms of agricultural production. In a 2014 report of the National Economic Development Authority, it was highlighted that SOCCSKSARGEN remains as one of the leaders in terms of crop production in the country [13]. Moreover, it is also known to be a top producer of high value crops such as coffee, banana, asparagus and oil palm and contributes greatly to the gross regional domestic product [8].

1.1. Problem statement

Given the abundant agricultural contribution of the SOCCSKSARGEN to the Philippine economy and its potential to significantly add to the escalating global problem on climate change, it is important to propose a policy that will encourage local farmers in the region to engage in organic agriculture. Moreover, considering the empirical and population gaps regarding organic farming adoption in the region, it is important to conduct a study that ascertains knowledge, attitude, and practices (KAP) toward organic agriculture of farmers among its localities. It is on this ground that the policy research is done to create a policy framework that aims to leverage stakeholders' support of organic farming for ecologically sound and sustainable community development. Through this initiative, the farmers who were historically silenced and marginalized as one of the most underserved sectors in the Philippines will finally be empowered to transform their silence into a collective force of social activism, ensuring that their insights not only reach the government but also contribute to advancing justice and structural support for Philippine organic agriculture [14, 15].

1.2. Objectives of the study

The study generally aims to design a policy framework that aims to leverage support of organic agriculture among local government units and communities in SOCCSKSARGEN Region in the Philippines for ecologically sound and sustainable community development. Specifically, it aims to: 1) Ascertain the level of knowledge, attitude, and practices toward organic farming of farmers in the SOCCSKSARGEN Region; and 2) formulate a policy framework that would address issues and problems related to organic farming.

1.3. Theoretical framework

The study is anchored on the Theory of Reasoned Action (TRA) of Fishbein [16] and Theory of Planned Behavior (TBP) of Fishbein and Ajzen [17]. Through these theoretical propositions, it can be asserted that the people's attitudes toward organic agriculture, considering both its risks and rewards, shape their interest and motives to engage in organic farming practices. Exhibiting positive attitudes toward organic agriculture, such as their beliefs to its environmental and health benefits to people, will increase the likelihood that they will adopt organic farming. Moreover, TRA and TBP suggest that farmers' perceived behavioral control could facilitate or hinder engagement in organic farming. Their level of knowledge and skills, access to resources, and farming constraints affect their adoption of organic agriculture.

1.4. Conceptual framework

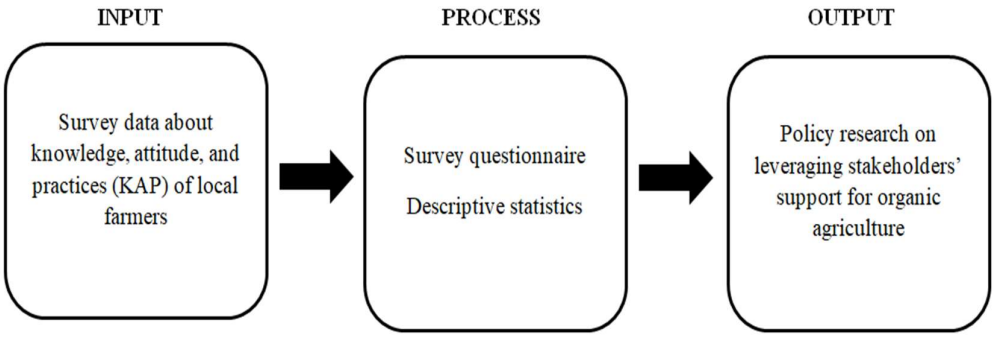

Figure 1. Input-Process-Output (IPO) as the conceptual paradigm of the study

2. Methodology

The study is policy research that employed a descriptive-survey research design. Descriptive survey was used to assess the level of knowledge, attitude, and practices toward organic farming among farmers in the SOCCSKSARGEN Region to formulate a policy framework to address the issues and problems related to organic farming knowledge, attitude, and practices (KAP). It aimed to provide a detailed and accurate representation of the data collected, allowing for the exploration of trends, patterns, and relationships between farmers' knowledge, attitude, and practices and the social, economic, and environmental benefits derived from organic agriculture [18].

Descriptive statistics was used in quantitative data analysis [19]. Firstly, frequency count and percentage were used in identifying the socioeconomic status of the farmers in terms of gender, age, ethnicity, and monthly income while mean was used in assessing the level of knowledge, attitude, and practices toward organic farming among farmers in the SOCCSKSARGEN Region.

The research was conducted in five municipalities in Region XII, comprising Kidapawan City in Cotabato Province, Lake Sebu in South Cotabato, Palimbang in Sultan Kudarat, Maitum in Sarangani, General Santos City.

Purposive sampling was used in sampling selection to safeguard the representativeness of the research population. Balanced selection was followed in the determination of the number of research respondents in every municipality [20]. 60 respondents were involved in the data collection from each municipality, producing a total of 300 research respondents in the entire region.

The respondents of the study are farmers from the selected municipalities in Region XII. As to their inclusion qualification, they are identified based on the following criteria: 1) They must be actively engaged in agricultural activities as their primary occupation; 2) they should have engaged in farming for 5 years and had sufficient understanding of farming practices relevant to the study to provide valuable insights about the phenomenon of interest; 3) they may be full-time or part-time farmers but farming must be a significant aspect of their livelihood; 4) and they involve in any type of agricultural production, including but not limited to crop cultivation, livestock rearing, mixed farming, or specialized horticulture.

Further, a common rule thumb on sampling adequacy requires inclusion of 200-300 respondents in estimating means and proportions in populations of a few thousand or fewer individuals [21, 22]. Hence, the study involved 300 respondents, who were equally distributed among five municipalities in the SOCCSKSARGEN Region. This sampling determination was also tested using Kaiser-Meyer-Olkin (KMO). Since the KMO values exceed 0.6, they are considered adequate [23]. Therefore, the Kaiser-Meyer Olkin measure of sampling adequacy, with a value of 0.665, is deemed acceptable.

3. Results and Discussion

3.1 Knowledge of farmers toward organic farming

Table 1 shows the knowledge of farmers towards organic farming in Region XII. The study revealed that respondents have a low level of knowledge towards organic farming (*M*=2.50). This implies that they have poor knowledge on ecologically balanced methods of farming that avoid the use of synthetic chemicals and other artificial and hazardous inputs to produce food in a manner that is environmentally sustainable, promotes biodiversity, and prioritizes the health and well-being of soil, plants, animals, and humans.

Furthermore, the finding is primarily attributed to the respondents' knowledge of crop rotation to control weed and pest and as well as improve soil fertility (*M*=2.89), the implementation of mono cropping system throughout the year to decrease diseases (*M*=2.88), and the use of trap methods to manage pests and diseases (*M*=2.86). However, it was also revealed that they are less likely to refrain from using chemical insecticides to control pests and diseases (*M*=2.14), chemical herbicides to manage weeds (*M*=2.14), and chemical fertilizers to increase plant growth (*M*=2.11).

Table 1. Knowledge of farmers towards organic farming in Region XII

Knowledge	Mean	Description
Rotating of crops to control weed, pest and also to improve soil fertility	2.89	Often
Using kitchen wastes, plant wastes and animal wastes to fertile soil and plants	2.41	Rarely
Doing pruning to reduce diseases that attack plants.	2.70	Often
Doing composting to improve soil fertility and water conservation	2.63	Often
Limiting the use of synthetic fertilizers to fertilize plants	2.41	Rarely
Avoiding controlling weed manually like hand weeding because it will only waste time	2.28	Rarely
Limiting the use of chemical pesticides to control pests	2.75	Often
Doing green manuring or plant cover crop to reduce soil erosion and increase soil fertility	2.32	Rarely
Using trap methods to control pests and diseases.	2.86	Often
Choosing resistant plant varieties to reduce damage to plants	2.26	Rarely
Avoiding practice of inter cropping / mixed cropping system because it can reduce soil fertility and water conservation	2.72	Often
Implementing mono cropping system for the full year to decrease diseases	2.88	Often
Refraining from using chemical insecticides to control pests and diseases	2.14	Rarely
Doing mulching to control weed	2.65	Often
Refraining from using chemical fertilizers to increase plant growth	2.11	Rarely
Refraining chemical herbicides to control weed	2.14	Rarely
Refraining from using biological control agents to control pests	2.42	Rarely
Overall	**2.50**	**Rarely**

Legend:

Response Scale	Range of Means	Descriptive Level	Interpretation
4	3.26 – 4.00	Always	Very High
3	2.51 – 3.25	Often	High
2	1.76 – 2.50	Rarely	Low
1	1.00 – 1.75	Never	Very Low

3.2 Attitude of farmers towards organic farming

Table 2 shows the attitude of farmers towards organic farming in Region XII. It was ascertained that respondents have a highly negative attitude towards organic farming (*M*=2.38). This implies that the farmers hold a poor impression toward organic farming as a sustainable and ecologically friendly agricultural practice.

Moreover, the finding is primarily attributed to respondents' perception that it is struggle to implement organic farming due to difficulties in obtaining organic matters (*M*=2.54), that it benefits the consumers more than the producers (*M*=2.53), and that it reduces the production cost by reducing the input purchases (*M*=2.48). However, they perceived that organic farming is less likely to increases their income (*M*=2.27), receive the necessary attention and support (*M*=2.25), or improve the texture and fertility of soil (*M*=2.12).

Table 2. Attitude of farmers towards organic farming in Region XII

Attitude	Mean	Description
Decreasing the production cost by reducing the input purchases	2.48	Rarely
Chemical pesticides that are more suitable to control pests	2.44	Rarely
Chemical herbicides that are more suitable to control weed	2.47	Rarely
Benefiting the consumers not the producers	2.53	Often
Acquiring the enough attention that is needed	2.25	Rarely
Struggling to implement organic farming due to difficulties in obtaining organic matters	2.54	Often
Struggling in implementation	2.35	Rarely
Increasing the texture and fertility of soil	2.12	Rarely
Increasing the income of farmers	2.27	Rarely
Overall	**2.38**	**Rarely**

Legend:

Response Scale	Range of Means	Descriptive Level	Interpretation
4	3.26 – 4.00	Always	Very High
3	2.51 – 3.25	Often	High
2	1.76 – 2.50	Rarely	Low
1	1.00 – 1.75	Never	Very Low

3.3 Practices of farmers towards organic farming

Table 3 shows the practices of farmers towards organic farming in different provinces in Region XII. The study revealed that farmers in the region poorly practice organic farming (*M*=2.37). This suggests that they often practice traditional and other forms of farming considering that the indicators of organic farming practices were not highly manifested among them. Furthermore, it was revealed that the respondents are less likely to engage in annual weeding or hand weed (*M*=2.30), use organic fertilizer (*M*=2.27), and follow green manuring or planting cover crop (*M*=2.00).

Table 3. Practices of farmers towards organic farming in Region XII

Practices	Mean	Description
Follow a crop rotation	2.49	Rarely
Engage in annual weeding or hand weed	2.30	Rarely
Follow inter cropping / mixed cropping.	2.39	Rarely
Use animal manure in farming	2.48	Rarely
Use plant waste in farming	2.41	Rarely
Use organic fertilizer	2.27	Rarely
Follow mulching in farming	2.47	Rarely
Follow green manuring or planting cover crop	2.00	Rarely
Use kitchen wastes in planting	2.34	Rarely
Use trap method to control pests	2.50	Rarely
Use insect predators to control pests	2.39	Rarely
Overall	**2.37**	**Rarely**

Legend:

Response Scale	Range of Means	Descriptive Level	Interpretation
4	3.26 – 4.00	Always	Very High
3	2.51 – 3.25	Often	High
2	1.76 – 2.50	Rarely	Low
1	1.00 – 1.75	Never	Very Low

3.4 Descriptive comparison of the knowledge, attitude, and practices of farmers toward organic farming

Table 4 shows the overall knowledge, attitude, and practices of farmers towards organic farming in different provinces in Region XII. It was determined in the study that the three variables were all rarely manifested among farmers in Region XII. The finding is supported by the theoretical framework of the study, comprising the Theory of Reasoned Action (TRA) of Fishbein [16] and Theory of Planned Behavior (TBP) of Fishbein and Ajzen [17], suggesting that the farmers' attitudes toward organic agriculture significantly shape their interest and motives to engage in organic farming practices. The study also revealed that that their knowledge about organic farming is higher than their attitude and practices of it, respectively.

Table 4. Overall knowledge, attitude, and practices of farmers towards organic farming in different provinces in Region XII

Dimensions	Mean	Description
Knowledge	2.50	Rarely
Attitude	2.38	Rarely
Practices	2.37	Rarely
Overall	**2.42**	**Rarely**

Legend:

Response Scale	Range of Means	Descriptive Level	Interpretation
4	3.26 – 4.00	Always	Very High
3	2.51 – 3.25	Often	High
2	1.76 – 2.50	Rarely	Low
1	1.00 – 1.75	Never	Very Low

3.5 Policy framework to leverage support for organic agriculture based on farmers' knowledge, attitude, and practices (KAP)

Table 5. Proposed matrix to address issues and problems related to farmers' knowledge, attitude, and practices

Domain	Findings	Policy Recommendation/s
Knowledge	• Farmers have poor knowledge about organic farming practices • Constant application of common agricultural practices (Monocropping System, Trap Method, and Crop Rotation) • Common use of chemical herbicides, fertilizers, and insecticides	• Implementation of educational programs and seminars about organic farming • Implementation of a program that provides for farmers' needs of organic materials (i.e., bio-fertilizers, organic pesticides, etc.)
Attitude	• Poor financial return in organic farming • Organic farming receives poor the attention from concerned stakeholders • Lack of access to organic farming materials	• Initiation of trade and promotion of organic farming produces • Implementation of an incentive-oriented program on organic agribusiness • Implementation of educational programs and seminars about organic farming • Inception of local organizational bodies that promote and support organic farming • Implementation of a systematic subsidization program.
Practices	• Poor practices of organic farming methods • Lack of organic materials resulting to limited engagement to organic farming	• Implementation of educational programs and seminars about organic farming • Implementation of a program that provides for farmers' needs of organic materials • Inception of local organizational bodies that promote and support organic farming

4. Conclusions

Several studies demonstrated how the agricultural sector significantly contributes to the escalating issue of greenhouse gases worldwide, and organic agriculture is found to be an important lever in moving the needle on climate change. It is a powerful tool to reduce climate change due to its potential to lessen global greenhouse gas emissions, enhance carbon storage in soil, and preserve biodiversity. Empirical and population gaps about organic farming adoption in the Philippines highlight the need to assess farmers' knowledge, attitude, and practices (KAP) toward organic agriculture to formulate an informed policy that will leverage support for organic farming among concerned stakeholders in the country, particularly in the Region XII. It was concluded that the three variables, namely the farmers' knowledge, attitude, and practices toward organic farming were all rarely manifested. This draws out an implication that the extent of their practices was largely attributed to their level of knowledge and attitude toward organic farming. Nevertheless, it can be gleaned in the data that their knowledge about organic farming is higher than their attitude and practices of it, respectively. At the end of the study, the researchers formulated a policy framework designed to strategically enhance support for the farming industry in the Philippines. The policy recommendations are particularly directed to the Department of Agriculture for the implementation of programs that address farmers' needs for organic materials and promote the trade and dissemination of organic farming procedures locally within one year. Finally, municipal agriculture offices of various local government units are encouraged to implement educational programs and seminars on organic farming to foster positive attitude toward its adoption in SOCCSKSARGEN, Philippines.

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