

Utilization of Fish Amino Acid (FAA) for Sustainable Organic Farming: An ICE Campaign

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ABSTRACT

This study focused on the conduct of an ICE (Information, Communication and Education) campaign to Geographically Isolated and Disadvantaged (GIDA) particularly in Barangay Digkilaan, Iligan City on sustainable organic farming using Fish Amino Acid (FAA). Specifically, it sought to (1) determine the demographic data of the respondents of Barangay Digkilaan, (2) identify the respondent's level of knowledge and awareness about organic fertilizer, (3) design an ICE campaign activity to GIDA on sustainable organic farming using Fish Amino Acid (FAA), and (4) describe the respondent's level of perception about organic fertilizer. Fourteen (14) residents of the said barangay were the participants of this study. Mixed method research design was utilized with the use of checkbox, open-ended questions and Likert scale questionnaire to gather and interpret both quantitative and qualitative data. Results revealed that only 7% of the respondents have attended training on farming conducted by the Department of Agriculture. Most of them have no background on organic fertilizer making but are willing to learn. Majority disagrees that they have experienced the support or benefits given by the government for organic fertilizer usage. At the end of the ICE training-workshop, the respondents successfully produced one liter (1L) of Fish Amino Acid Organic Fertilizer. This indicates that the respondents were able to learn the competencies of FAA making. It is recommended that more ICE campaign and training-workshops may be organized to spread awareness to the people, especially those that live in geographically isolated and disadvantaged areas and teach proper practices on organic fertilizers.

Keywords: Fish Amino Acid (FAA), GIDA, ICE, Organic Farming, Organic Fertilizer

INTRODUCTION

Abundant with natural resources, tropical climate condition, and vast terrain with 47% of 30 million hectares of land area is suitable for agriculture, the Philippines is considered as an agricultural country. Obviously, Filipino's primary source of income is crop production in sugarcane, rice/palay, coconut, banana, corn, pineapple, cassava, mango, sweet potato, rubber and other crops [1].

However, most of the farmers are practicing conventional agriculture to ensure a good harvest in easier preparation and a low production cost in spite of the risk in health and environment. They use pesticides, herbicides, fungicides, rodenticides, artificial fertilizers, growth promoters, harmful chemicals and preservatives to increase longevity for food production [2].

With the threat to human health and detrimental effects to the environment due to the residues of chemicals and inorganic fertilizers, the passage of Republic Act No. 10068 (Organic Agriculture Act of 2010) institutionalized the promotion and development of organic agriculture in the country for the purpose of transforming back to eco-friendly, economic-viable, and green agriculture. This is then amended as RA 11511

which introduces provisions like conduct of a nationwide educational and awareness campaign among consumers, adoption of the Participatory Guarantee System (PGS) as a community or group-based certification process, protection of organic resources against cross contamination by genetically engineered organisms, and provision of marketing assistance to organic producers that would ensure decent returns [3].

In 2015, the Philippines had 234,000 ha of organic production area catering to the export market (majority came from coconut products) including the US, Japan and Korea. In 2017, the Philippines ranked 5th in the world among the highest organic producers. Pandemic brought increase demand for organic products as people opt for healthier lifestyle - chemical/pesticide-free fruits and vegetables and antibiotic-free/naturally raised livestock animals [4]. Organic products may not be possible without the aid of organic pesticides and fertilizers. One of it is fish amino acid (FAA) organic fertilizer.

A number of studies have been published in support for the effectiveness of FAA for plant growth and development, soil reconditioning, soil fertility, increased microbial activity in the soil, insect repellent to plant [5, 6], rice cultivation and production [7], growth and yield responses of potato [8], black soybeans [9], and even in marigold flower plants [10].

Despite the passage of formal legislation and good market opportunity, farmers are still reluctant to fully convert from conventional to organic farming [11]. The main issue lies on transforming more than 90% farmers currently under conventional farming back to natural and organic agriculture. To motivate farmers to shift their farming systems into organic agriculture requires not only science-based technology and huge funding support but also educational and awareness campaign among consumers on health benefit and the environmental impact of consuming organic products.

Hence, the researchers find interest to conduct ICE (Information, Communication and Education) to Geographically Isolated and Disadvantaged (GIDA) Community, particularly in Barangay Digkilaan, Iligan City on sustainable farming using Fish Amino Acid (FAA) organic fertilizer. Specifically, it sought to achieve the following:

1. Determine the demographic data of the respondents of Barangay Digkilaan.
2. Identify the respondent's level of knowledge and awareness about organic fertilizer.
3. Design an ICE campaign activity to GIDA on sustainable organic farming using Fish Amino Acid (FAA).
4. Describe the respondent's level of perception about organic fertilizer.

METHODOLOGY

The study was conducted from October to December 2023 to the fourteen (14) respondents of Barangay Digkilaan. The said barangay is an identified Geographically Isolated and Disadvantaged (GIDA) Community in Iligan City. The study employed a random sampling procedure to come up with the participants of the study.

Mixed method research design was utilized which collects and analyzes both quantitative and qualitative data to answer the research problems. Three (3) questionnaires were used to collect pertinent data for this study which were researcher-made and underwent face validation with the content and pedagogy expert. The questionnaires are the following (1) Barangay Digkilaan Respondents' Demographic Data which includes: Sex, Age, Educational Attainment, Occupation, Trainings Attended (on farming), and Farming Practices (2) Barangay Digkilaan Respondents' Level of Knowledge and Awareness about Organic Fertilizer, and (3) Barangay Digkilaan Respondents' Perception about Organic Fertilizer, namely: Perceived Effectiveness, Barriers to Organic Fertilizer Usage, Environmental Health and Concerns, Perceptions of Crop Quality and Market Demand, Government and Policy Support.

A survey type of instrument was utilized to gather data using checkbox and open-ended questions for the first two questionnaires and Likert scale for the last questionnaire utilizing a four-point scale ranging from low to

high competency.

The data gathering procedure followed these steps: (1) The researchers conducted a needs-assessment to the respondents by providing them with a level of awareness questionnaire. (2) From the data obtained during the needs- assessment, the ICE campaign was designed and planned. (3) After the planning, the ICE campaign was conducted to the respondents. (4) At the end of the campaign, a perception questionnaire was given to the respondents. Their views and opinion on the organic fertilizer was obtained.

Descriptive statistics, including the weighted means, frequency counts, and percentages were used as a statistical technique to determine the demographic data of the respondents of Barangay Digkilaan and identify their level of awareness about organic fertilizer. The views of the participants were also considered and tallied based on the open-ended questions during interviews. The instrument used for perception about organic fertilizer is reliable with a Cronbach’s Alpha equivalent to 0.753. Overall, sixty-four (64) items have been divided into three (3) categories.

To describe respondents’ perception about organic fertilizer, the following rating scale was used to understand the data better:

Rating	Range	Descriptive Rating
4	3.26 - 4.00	Strongly Agree
3	2.51 - 3.25	Agree
2	1.76 - 2.50	Disagree
1	1.00 - 1.75	Strong Disagree

Rating	Range	Descriptive Rating
4	3.26 - 4.00	Very Knowledgeable
3	2.51 - 3.25	More Knowledgeable
2	1.76 - 2.50	Less Knowledgeable
1	1.00 - 1.75	Least Knowledgeable

RESULTS AND DISCUSSION

The results of this study are presented under four subsections, namely, Demographic Profile of the Respondents from Barangay Digkilaan, Barangay Digkilaan Respondents’ Level of Knowledge and Awareness about Organic Fertilizer, The Conduct of Information, Communication, and Education (ICE) Campaign and Workshop on Organic Fertilizer, and Barangay Digkilaan Respondents’ Perception about Organic Fertilizer.

Barangay Digkilaan Respondents’ Demographic Data

Prior to administering the Information, Communication, and Education (ICE) campaign and workshop, a needs- assessment was conducted to the respondents to determine their demographic profile, trainings attended and farming practices.

Table 1 Barangay Digkilaan Respondents’ Demographic Data

Component	Frequency	Percent%
<i>Sex</i>		
Male	2	14%

Female	12	86%
Age		
Under 18	6	43%
19-29	1	7%
30-39	1	7%
40-50	3	21%
Above 50	3	21%
Educational Attainment		
Elementary	1	7%
Elementary graduate	1	7%
High school	7	50%
High school graduate	3	21%
College graduate	1	7%
Vocational	1	7%
Occupation		
Employed		
0-5 yrs.	1	7%
6-10 yrs.	0	0%
10-15 yrs.	1	7%
15 above	0	0%
Government		
Permanent	0	0%
Contractual	1	7%
Private		
Permanent	1	7%
Contractual	1	7%
Self-employed	2	14%
Unemployed	7	50%

Table 1 shows the demographic profile of the respondents of Barangay Digkilaan. It is composed of the following components: Sex, Age, Educational Attainment, and Occupation.

Eighty-five percent (85%) of the total population comprised female respondents and only 14% were male. The age of the respondents was varied with forty-two (42%) of them belonged to the age bracket of under 18. The respondents also had varied responses on the educational attainment, but a majority of them, fifty percent (50%), were able to reach high school. Seven percent (7%) were college graduate and seven percent (7%) were able to take up vocational courses. Half of the total population, fifty percent (50%), were unemployed. The other half worked for the government and private sectors with seven percent (7%) for the former and fourteen percent (14%) for the latter.

This implies that a majority of the respondents coming from GIDA were unemployed and attained only high school education.

The respondents were also assessed if they were able to attend previous trainings on farming. Table 2 shows the data on the trainings attended by Barangay Digkilaan respondents on farming.

Table 2 Barangay Digkilaan Respondents' Trainings Attended on Farming

Component	Frequency	Percent (%)
<i>Training</i>		
Department of Agriculture training	1	7%

Seven percent (7%) of the respondents were able to attend a training conducted by the Department of Agriculture on farming. The data shows that there is a lack of training on farming, thus, there is a need to organize more trainings to spread awareness and teach proper practices to the people especially those that live in geographically isolated and disadvantaged areas.

In the Philippines, almost half of the population resides in rural areas that depend on agriculture as their primary source of income; among them are the indigenous people, landless farmers and fishermen [12].

Recent reports on poverty and food security have highlighted the importance of raising smallholders' productivity and ensuring that development assistance reaches them [13]. According to [14] training and education plays an important role in smallholder farmer development. Research showed that smallholder farmers can benefit from training in agricultural techniques, business management and marketing skills [15, 16].

The researchers also determined the farming practices of the respondents. Table 3 shows the data on the data on the farming practices of the respondents of Barangay Digkilaan.

Majority, sixty-four percent (64%), owned a farm or backyard garden. Eight percent (8%) of the kinds of crops that they have planted were vegetables; this is followed by corn with twenty-nine percentage (29%). Seven percent (7%) were able to plant root crops, spices, and "niyog". Only two percent (2%) grew fruit-bearing trees. For the status of their crops, six percent (6%) responded that they are healthy with three percent (3%) of the respondents answered that their crops are infested with pests.

Table 3 Barangay Digkilaan Respondents' Farming Practices

Component	Frequency	Percent (%)
<i>Farm or Backyard Garden</i>		
Yes	9	64%

No	5	36%
<i>Kinds of Crops</i>		
Corn	4	29%
Root crops	1	7%
Fruits	2	14%
Vegetables	8	57%
Spices	1	7%
Others:	Niyog	1 7%
	None	2 14%
<i>Crop Status</i>		
Healthy	6	43%
Unhealthy	1	7%
Infested with pest	3	21%

The data implies that most of the respondents had farm or backyard gardens, were mostly growing vegetables and root crops, had healthy harvests with a small percentage experiencing pest infestation, thus, they are the appropriate target for the conduct of the ICE campaign and workshop.

Barangay Digkilaan Respondents' Level of Awareness about Organic Fertilizer

Prior to administering the Information, Communication, and Education (ICE) campaign and workshop, a needs-assessment was conducted to the respondents to determine their level of awareness about organic fertilizer.

Table 4 Barangay Digkilaan Respondents' Level of Awareness about Organic Fertilizer

Component	Frequency	Percent (%)
<i>What kind of fertilizer did you use in your crops?</i>		
Organic	1	7%
Inorganic	4	29%
None	4	29%
<i>Do you know how to make organic fertilizer?</i>		
Yes	1	7%
No	12	86%
<i>What are the raw materials did you use in making organic fertilizer?</i>		
Vegetables and fruits	1	7%
“Eti sa manok”	1	7%
<i>Are you willing to learn how to make organic fertilizer?</i>		

Yes	11	79%
No	2	14%

Table 4 shows the data on the level of awareness of the respondents on organic fertilizer. Only seven percent (7%) utilized organic fertilizer and twenty-nine percent (29%) were using inorganic fertilizer. The respondents were able to answer that they make use of vegetables and fruits and “eti sa manok” when making their own organic fertilizer. Majority of them, twelve percent (12%), has no knowledge on how to make organic fertilizer. Consequently, seventy-nine percent (79%) were willing to learn how to make organic fertilizer.

This implies that a lot of the respondents do not know how to make organic fertilizer and twenty-nine (29%) of them are currently using inorganic fertilizer. Only two respondents have been using organic wastes and products as fertilizers. Lastly, majority of them were willing to learn how to make organic fertilizers.

In the Philippines, the adoption rate of organic agriculture is still low despite the efforts of the government and the enactment of the Republic Act No. 10068 or the Philippine Organic Agriculture Act in 2010 [17]. In terms of awareness, the farmers’ awareness about organic farming is only around low to medium and the major sources of information are non-government organizations (NGOs) and private institutions. Therefore, access to third party entities such as the extension efforts from NGOs and other private organizations has a great potential to increase the adoption of organic farming [18, 19].

The Conduct of the Information, Communication, and Education (ICE) Campaign, Training-Workshop and Utilization of Organic Fertilizer through Implementation

The framework used in this study is shown in Figure 1. Empowering GIDA for Sustainable Organic Farming through an ICE Campaign, Training-Workshop on FAA making, and Implementation on the acquired knowledge to utilize FAA to selected crops in the farm/backyard garden.

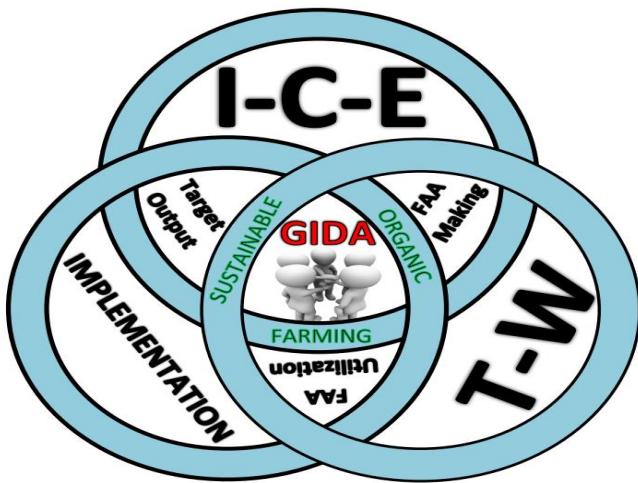


Figure 1 The Framework of the ICE Campaign to GIDA for Sustainable Organic Farming

The figure, in the previous page, explains the details of the whole research process. A random sampling procedure was utilized to determine the participants of the study. Mixed method research design was utilized to gather quantitative and qualitative data. The first step of the research process was obtaining the respondents’ demographic profile and level of knowledge and awareness about organic fertilizer. This was done to obtain pertinent qualitative data on the needs of the respondents. The data helped in the designing, planning and implementation of the ICE campaign. The researchers were able to determine the majority of the respondents had no knowledge on how to make organic fertilizer, thus, the appropriate step is to conduct an Information, Communication, and Education campaign on the proper process of making and utilizing organic fertilizer.

The program of the ICE campaign are composed of the following events: (1) Lectures on organic farming and organic fertilizer spearheaded by the researchers. Valuable inputs were delivered by the researchers to the

respondents that they may use during the workshop proper and implementation stage. (2) This was followed by the workshop on organic fertilizer making. For the organic fertilizer making, the Fish Amino Acid (FAA) Fertilizer was chosen. The following material are utilized: fish waste (gills, small fishes, even whole fish) and molasses. The process was demonstrated and the respondents followed the steps with precaution. At the end of the workshop the respondents were able to make one liter (1L) of Fish Amino Acid Fertilizer. The final output that was assigned to the respondents is the utilization of Fish Amino Acid (FAA) Organic Fertilizer in a sample plant in their respective gardens for a month. (3) After the workshop, a survey on the perception of the respondents was conducted to obtain quantitative data. This was done to determine their views and opinions on the conducted ICE campaign, making and utilization of organic fertilizer, and organic farming. On the data analysis, weighted means, frequency counts, and percentages were utilized.

Barangay Digkilaan Residents’ Responses on the Perception Questionnaire on Organic Fertilizer

After the conduct of the ICE campaign and workshop, a perception questionnaire was given to the respondents. This was done to gather their views and opinions on organic fertilizer. The questionnaire is further subdivided into the following components, Farmers’ Knowledge and Awareness, Perceived Effectiveness, Barriers to Organic Fertilizer Usage, Environmental Health and Concerns, Perceptions of Crop Quality and Market Demand, and Government and Policy Support.

Table 5, in the previous page, shows the level of knowledge of the respondents on Organic Fertilizer. Majority of the statements are rated Very Knowledgeable by the respondents. With a mean of 3.89, the respondents are very knowledgeable on organic fertilizers as a viable alternative to chemical fertilizers. This shows a high level of awareness on the positive benefits of organic fertilizer among the respondents. This could also be an indicator that the respondents are willing to trade off chemical fertilizers for organic ones. With a mean of 3.22, the respondents are aware of the different types of organic fertilizers available. This data shows that there is still a considerable number of respondents who need to be properly informed on the matter. Proper dissemination of information would play a great role in improving their awareness.

With a mean of 3.72 and 3.44, the respondents are very knowledgeable on the benefits of using organic fertilizer and proper application of organic fertilizer, respectively. This implies that the respondents have gained valuable information from the ICE that was conducted. With a mean of 3.61, the respondents are now very knowledgeable on organic fertilizer usage after the conduct of the ICE. With an overall mean of 3.58, the respondents are very knowledgeable on organic fertilizer. This implies that the ICE that was conducted was effective on improving their level of knowledge and awareness.

Table 5 Barangay Digkilaan Respondents’ Level of Knowledge and Awareness about Organic Fertilizer

Statements	Mean	Description
1. Organic fertilizers are a viable alternative to chemical fertilizers.	3.89	Very Knowledgeable
2. I am aware of the different types of organic fertilizers available.	3.22	More Knowledgeable
3. I understand the benefits of using organic fertilizer for crop production.	3.72	Very Knowledgeable
4. I know how to properly apply organic fertilizer in my crops.	3.44	Very Knowledgeable
5. I have received training or information on organic fertilizer usage.	3.61	Very Knowledgeable
OVERALL MEAN	3.58	Very Knowledgeable

Legend: 3.26 - 4.00 Very Knowledgeable

2.51 - 3.25 More Knowledgeable

1.76 - 2.50 Less Knowledgeable

1.00 - 1.75 Least Knowledgeable

In a study conducted by [20], nearly half of the respondents (47.4%) categorized as demonstrating a medium level of attitude toward organic fertilizer adoption and 49 (42.3) had a high attitude on organic fertilizer adoption. The increasing attitude level of farmers indicate that they are now more interested and willing to adopt organic fertilizer in farming. While in the Philippine setting, farmers showed a positive mean attitude score on organic agriculture. They registered more positive attitudes on the Cost and benefits aspect as compared to the aspect of organic agriculture in general [21].

On the perceived effectiveness of organic fertilizers, as shown in Table 6, majority of the statements were rated Strongly Agree by the respondents. With a mean of 3.89 and 3.78, the respondents strongly agree that the organic fertilizer improves soil structure and fertility and enhances crop yield and quality, respectively. With a mean of 3.50 and 3.67, the respondents strongly agree that organic fertilizers reduce the risk of soil degradation and promote healthier and more resilient crops. This implies that the respondents strongly agree that organic fertilizer brings positive benefits to the plants, soil, and the farmers. Thus, with an overall mean of 3.60, the respondents perceive the immense effectiveness of the utilization of organic fertilizer on farming.

Organic fertilizers offer the biological process necessities of plants and conjointly suppress the plant pests' populations [22]. Additionally, they increase the microorganism activity in soil, anion and cation exchange capability, organic matter and carbon-content of soil. Organic fertilizers increase the quality and yield of agricultural crops in ways similar to inorganic fertilizers [23], however it does not cause environment pollution. Organic fertilizers help to prevent diseases by meeting the plants 'nutritional needs and enhancing plant tolerance [24].

Table 6 Barangay Digkilaan Respondents' Perception on the Perceived Effectiveness of Organic Fertilizer

Statements	Mean	Description
1. Organic fertilizers improve soil structure and fertility.	3.89	Strongly Agree
2. Organic fertilizers enhance crop yield and quality.	3.78	Strongly Agree
3. Organic fertilizers reduce the risk of soil degradation.	3.50	Strongly Agree
4. Organic fertilizers promote healthier and more resilient crops.	3.67	Strongly Agree
5. Organic fertilizers are cost-effective compared to in-organic fertilizers.	3.17	Agree
OVERALL MEAN	3.60	Strongly Agree

Legend: 3.26 - 4.00 Strongly Agree

2.51 - 3.25 Agree

1.76 - 2.50 Disagree

1.00 - 1.75 Strongly Disagree

With a mean of 3.17, the respondents agree that organic fertilizers are cost-effective. This data implies that only a fair number of the respondents know that organic fertilizers are cost-effective. This is an opportunity to organize more events that are focused on the discussion of cost-effectiveness of organic fertilizer.

On the barriers to organic fertilizer usage as stipulated on Table 7, two out of five statements were rated Agree and three out of five statements were rated Disagree by the respondents. The respondents agree that the cost of organic fertilizer is prohibitive and that they have concerns on the availability and accessibility of organic

fertilizers. The ingredients of organic fertilizer are readily available in backyards or in nearby markets. Marketed organic fertilizers are typically solid and based on animal or plant materials [25], such as blood meal, cocoa shells, animal manures and soybean meal, amongst others [26]. The concern on availability and accessibility is not a major component to disregard the use of organic fertilizer since the ingredients are readily available. On the cost as well, the farmers would save much more on the ingredients of organic fertilizer than when using inorganic fertilizer.

The respondents disagree on the effectiveness of organic fertilizer as compared to inorganic alternatives, that limited knowledge would hinder their use of organic fertilizer, and that it is a challenging task to integrate organic fertilizer in their current crop production practices. This implies that they have a positive attitude toward the incorporation and utilization of organic fertilizers in farming. Organic fertilizers improve biodiversity (soil life) and long-term productivity of soil, and may prove a large depository for excess carbon dioxide. Organic nutrients increase the abundance of soil organisms by providing organic matter and micronutrients for organisms such as fungal mycorrhiza (which aid plants in absorbing nutrients), and can drastically reduce external inputs of pesticides, energy and fertilizer, at the cost of decreased yield. In a study conducted on the major limitations of organic fertilizer, it was found out that they are not immediately available to the plants, require large amounts to have desired effects; extra investment in labour for harvesting and preparation. The best approach is to combine calculated quantities of organic fertilizer with inorganic fertilizer [27].

Table 7 Barangay Digkilaan Respondents' Perception on the Barriers to Organic Fertilizer Usage

Statements	Mean	Description
1. The cost of organic fertilizers is prohibitive for me.	2.56	Agree
2. I have concerns about the availability and accessibility of organic fertilizers.	2.78	Agree
3. I worry about the effectiveness of organic fertilizers compared to in-organic alternatives.	2.22	Disagree
4. Limited knowledge and guidance hinder my use of organic fertilizers.	2.39	Disagree
5. It is challenging to integrate organic fertilizers into my current crop production practices.	2.44	Disagree
OVERALL MEAN	2.48	Disagree

- Legend:
- 3.26 - 4.00 Strongly Agree
 - 2.51 - 3.25 Agree
 - 1.76 - 2.50 Disagree
 - 1.00 - 1.75 Strongly Disagree

Five out of five statements under Environmental Health and Concerns were rated Strongly Agree. The respondents strongly believe that organic fertilizers are environment-friendly, can contribute to reducing water pollution, and can help reduce harmful chemical runoff into water system. They are concerned on the negative impact of inorganic fertilizers to the environment and its effect on the health of the people. Non-organic fertilizers mainly contain phosphate, nitrate, ammonium and potassium salts. Excessive use of chemical fertilizers resulted in a large number of environmental problems because some fertilizers contain heavy metals (eg cadmium and chromium) and high concentrations of radionuclides. Over time, the use of inorganic fertilizer causes pollution, deterioration of soil fertility, soil degradation reactions occurring in the soil which leads to deterioration of the balance of the current element. In addition, toxic substances accumulate within the vegetables causing negative effects in humans and animals when consumed [28].

Table 8 Barangay Digkilaan Respondents' Perception on Environmental Health and Concerns

Statements	Mean	Description
1. I believe that using organic fertilizers is environment-friendly.	3.67	Strongly Agree
2. I am concerned about the negative environmental impact of in-organic fertilizers.	3.44	Strongly Agree
3. I am worried about the health effects of in-organic fertilizer residues in crops.	3.56	Strongly Agree
4. Organic fertilizer use can contribute to reducing water pollution.	3.72	Strongly Agree
5. Organic fertilizer usage can help reduce harmful chemical runoff into water system.	3.94	Strongly Agree
OVERALL MEAN	3.68	Strongly Agree

Legend: 3.26 - 4.00 Strongly Agree

2.51 - 3.25 Agree

1.76 - 2.50 Disagree

1.00 - 1.75 Strongly Disagree

With an overall mean of 3.68, the respondents strongly agree that organic fertilizers are environment-friendly, thus, it does not pose any risks on the environment and on the health of the people.

Five out of five statements under Perceptions of Crop Quality and Market Demand were rated Strongly Agree as depicted in Table 9.

The respondents strongly agree that crops grown with organic fertilizer have higher quality, can improve marketability and consumers are willing to pay for organically grown crops. There is also an increasing trend in the demand of organic produce observed by the respondents. Many studies have proved quite unequivocally that vegetables and fruits from organic farms have a better taste and smell. This was found for carrots and potatoes, celery and red beetroot, head cabbage and tomatoes as well as for apples, cherries and redcurrants. Organic fruits contained more total sugars, which probably influenced the better taste perception by consumers [29]. An increased number of recent studies have shown the positive impact of consumption of crop-based foods on human health [30]. Especially intake of fruits and vegetables has been found important to prevent cardiovascular diseases and obesity [31].

In a study conducted on the consumer preferences on organic food purchase, it was found out that Romanians prefer to buy organic foods directly from producers followed by supermarkets [32]. This data supports that people would pay a price for organic produce and organic fertilizer increases crop marketability. With an overall mean of 3.56, the respondents strongly agree that organic fertilizer would improve the quality of crops being produced and would be generating a good income for the farmers.

Table 9 Barangay Digkilaan Respondents' Perception on Crop Quality and Market Demand

Statements	Mean	Description
1. Crops grown with organic fertilizers are of higher quality.	3.67	Strongly Agree
2. Consumers are willing to pay a premium for organic fertilizer-grown crops.	3.39	Strongly Agree

3. I have noticed an increase in market demand for organically grown produce.	3.35	Strongly Agree
4. I believe that using organic fertilizers can help me access niche markets.	3.67	Strongly Agree
5. Organic fertilizer usage can improve the marketability of my crops.	3.72	Strongly Agree
OVERALL MEAN	3.56	Strongly Agree

Legend: 3.26 - 4.00 Strongly Agree
 2.51 - 3.25 Agree
 1.76 - 2.50 Disagree
 1.00 - 1.75 Strongly Disagree

On government and policy support shown in Table 10, four out of five statements were rated Agree and one out of five statements was rated Disagree. The implementation of organic agriculture in the Philippines traces its roots in the early years of non-government organizations’ advocacy for sustainable agriculture. In support to these initiatives, and to provide Filipino small farmers a sustainable alternative to conventional farming, the Philippine Government has enacted into law, Republic Act 10068 known as Organic Agriculture Act of 2010. The signing of RA 10068 then gave birth to the National Organic Agriculture Program (NOAP) of the Philippine Department of Agriculture (DA). This milestone legislation has been considered to be one of the priority programs of the government as a major strategy for addressing rural poverty through low-input sustainable agricultural techniques that improve land productivity and, at the same time, protect the environment.

Since the inception of the NOAP, the country’s agricultural area devoted to organic farming has significantly increased from 14,140 hectares in 2006 to 349,041 hectares at the end of 2016 and extended its support to 116,558 farmer-beneficiaries [33]. Amidst the effort of the government to support organic farming, the respondents say otherwise. A majority of them disagree from the statement that they have benefitted from government support for organic fertilizer usage. Perhaps, the efforts are not nearly enough and must be increased so that it reaches far flung areas, specifically geographically isolated and disadvantaged areas.

Table 10 Barangay Digkilaan Respondents’ Perception on Government and Policy Support

Statements	Mean	Description
26. Government policies and incentives support the use of organic fertilizers.	2.67	Agree
27. I am aware of government programs promoting organic farming.	2.83	Agree
28. I have benefited from government support for organic fertilizer usage.	2.33	Disagree
29. Government regulations facilitate the distribution of organic fertilizers to farmers.	2.61	Agree
30. I believe that more government support is needed to encourage organic fertilizer adoption.	3.11	Agree
OVERALL MEAN	2.71	Agree

Legend: 3.26 - 4.00 Strongly Agree
 2.51 - 3.25 Agree
 1.76 - 2.50 Disagree
 1.00 - 1.75 Strongly Disagree

With a mean of 2.71, the respondents agree on government policy and support. This implies that, although, there is a law on the utilization of organic fertilizer and there are agencies who helped put it into action, little has been felt by the respondents. There is an utmost need for agencies to reach out more to far flung areas like GIDA. Continuous support and encouragement would make a great impact on the improvement of organic farming in the country.

Table 11 Summary of the Responses of the Residents of Barangay Digkilaan on Organic Fertilizer

Statements	After (Mean)	Description
<i>Level of Knowledge and Awareness</i>	3.58	Very Knowledgeable
<i>Perceived Effectiveness</i>	3.60	Strongly Agree
<i>Barriers to Organic Fertilizer Usage</i>	2.48	Disagree
<i>Environmental and Health Concerns</i>	3.68	Strongly Agree
<i>Perceptions of Crop Quality and Market Demand</i>	3.56	Strongly Agree
<i>Government and Policy Support</i>	2.71	Agree
Overall Mean	3.26	Strongly Agree

Legend:

3.26 - 4.00 Strongly Agree; Very Knowledgeable

2.51 - 3.25 Agree; More Knowledgeable

1.76 - 2.50 Disagree; Less Knowledgeable

1.00 - 1.75 Strongly Disagree/ Least Knowledgeable

Table 11 shows the summary of the responses on perceptions of the residents of Barangay Digkilaan on organic Fertilizer. With an overall mean of 3.26 being in the Strong Category indicates that there is an overall positive perception on the ICE campaign and workshop, organic fertilizer usage, and organic farming.

CONCLUSION AND RECOMMENDATIONS

In the light of the study, the following conclusions were drawn: Majority of the respondents are females who are high school students aged 18 below and unemployed. Only seven percent (7%) of the respondents attended a training conducted by the Department of Agriculture on farming, but most of them has farm or backyard garden planted with healthy vegetables using inorganic fertilizer. They also experienced crop infestation. More than half of them do not know how to make organic fertilizer but are willing to learn since they just used chicken dung and rotten vegetables and fruits. The conduct of ICE to the respondents was a success as they were able to make one container of Fish Amino Acid Fertilizer at the end of the workshop.

Overall, the respondents strongly agree that organic fertilizers are viable alternatives to chemical fertilizers. They strongly agree as well that it is effective and provide positive benefits not only to the crops and soil, but also to one's health as compared to inorganic fertilizer. They strongly agree on the crop quality and market demand of organic fertilizer-grown crops. However, they agree on the cost, availability and accessibility which will prohibit them to use organic fertilizer. Majority of them disagree from the statement that they have benefitted from government support for organic fertilizer usage.

Based on the aforementioned conclusion, there is a need to organize more ICE campaign and training-workshops to spread awareness to the people, especially those that live in geographically isolated and

disadvantaged areas. Proper methods on how to make and utilize organic fertilizer should be disseminated to improve the organic farming practices of Filipinos.

The government may consider additional funds/subsidy and provision of marketing assistance in support of farmers practicing organic farming. Farmers may also be provided with organic materials, seeds, planting materials, as well as science-based technology inputs. To ensure decent and rightful returns, direct consumer-organic farmers' partnership may be established.

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