International Journal of
Recent Innovations in Academic Research
Open Access, Peer Reviewed, Abstracted and Indexed Journal

E-ISSN: 2635-3040; P-ISSN: 2659-1561
Homepage: https://www.ijriar.com/
Volume-5, Issue-12, Dec-2021: 01-15

Research Article

Farmers' Awareness on Integrated Diversified Organic Farming Systems

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Received: November 24, 2021 **Accepted:** December 5, 2021 **Published:** December 12, 2021

Abstract: This study aimed to analyze the level of awareness on Integrated Diversified Organic Farming System or IDOFS) among farmers from Victoria, Oriental Mindoro, Philippines. Descriptive research design in a quantitative approach was used in this study. Data were gathered and collected through survey questionnaires, subjected to validity and reliability testing. It was distributed to 111 randomly sampled farmers. Descriptive statistical tools were utilized in the treatment of data. Majority of the farmers were 41-50 years old, male, married, high school graduate, with 26-30 years of experience in farming, tenants, and cultivating 3 hectares of land or less. It was found out that they were not aware of the practices, methods, and utilization of various IDOFS components. Age, sex, and number of years in farming were deemed to be not significant with IDOFS component systems; the remaining profile variables had significant relationship with identified specific components of IDOFS. An extension program may be proposed to help address the unawareness of the farmers on various organic agriculture systems.
Keywords: Organic farming, sustainable agriculture, food security, climate change resilience, extension program.

Introduction

The Philippines is predominantly an agricultural country composed of small farms. Widespread poverty continues to be a big problem in the country and Filipino adults and children continue to be afflicted by various forms of malnutrition, such as underweight, under height, and wasting. A viable agricultural solution to this problem is the practice of diversified and integrated farming systems. For centuries, farming communities have developed resilient and bountiful agricultural systems based on biodiversity and on their knowledge of how to work with them in equally complex biophysical and sociocultural settings. Some examples of diversified cropping systems in the Philippines are multi-storey system, bio-intensive gardening, sloping agricultural land technology, the vegetable-agroforestry systems, and complex upland food-production systems. Farmers have provided stability and sustainability of the agricultural production system, and hence, food security through the utilization of functional diversity in their farms and farming systems. Compared with monocultures, polycultures are more productive, utilize natural resources and photo synthetically active radiation more efficiently, resist pests epidemics better, produce more varied and nutritious foods, contribute more to economic stability, social equality, and provide farmers' direct participation in decision making. These systems provide valuable information for the development of sustainable agricultural production system (De Guzman, Zamora, & Bernardo, 2015).

Integrated Diversified Organic Farming System (IDOFS) is a farm practice that addresses and recovers our environment from climate change and ensures nutrition security. It also pursues family participation in farming community development sustainability, and self-resilience of farmers (Gandon, 2016). This system has seven indicators. It should be ecologically sound, economically viable, socially just and equitable, culturally sensitive, technologically appropriate, wholesome, and innovation. Ecologically sound indicator means that it encourages all people to develop their full human potential in such ways that the environment, with all its complexity, essential cycles, and relationships, remains intact, functioning, and healthy (Magdoff, 2014).

Economic viability, is the economic potential to embark on a new technology and to safeguard its continuation in order to uphold all the other values (Taebi, 2013). Another indicator is being socially just and equitable; social justice says that individuals and groups should receive fair treatment and an impartial share of the benefits of society (Hemphill, 2015) while social equity implies a calculation of fairness, right, and justice (Nalbandian, 1989; Guy & McCandless, 2012). Cultural sensitivity is the knowledge, awareness, and acceptance of other cultures (Kubokawa & Ottaway, 2009). Appropriate technology is any object, process, ideas, or practice that enhances human fulfillment through satisfaction of human needs (Hazeltine & Bull, 2003). Wholesomeness, in the food context, is the promotion of the health of the body (USDA, 2019). Innovation is a new or changed entity realizing or redistributing value (ISO, 2021). These indicators serve as a guide for the farmers to practice more efficient and eco-friendly farming system in order to provide their family a healthy food and at the same time, to take care of the nature while farming.

IDOFS farming system is currently used in Kuatro Marias' Agro-Ecology Farm located at Barangay San Narciso, Victoria, Oriental Mindoro, Philippines. These are rice-fish-duck system, rice-pig-fish system, multi-storey cropping, three-strata forage system, agro-forestry, sloping agricultural land technology, sorjan cropping system, and *balag, palayan, isda, gulay* (vine trellis, rice field, fish, vegetables) or *balagdayan.* Rice monoculture is the main source of income of the family and community. It is managed by the owner who is personally the farm technician and a community organizer by profession under the *Pambansang Kilusan ng Samahang Magsasaka* or PAKISAMA.

Engaging into the adoption of IDOFS, together with its dimensions, provides possible and sustainable solution to restore a healthier and a more green environment and biodiversity for the future generation. It will also expand the knowledge of the farmers on how to conserve nature without polluting its elements. It helps to reduce the pollution and any other possible problems which lead to food insufficiency, climate change, and short-term agriculture (Gandon, 2016). To achieve such developments towards sustainable agriculture, food security, and climate resiliency, popularization of IDOFS may help the farmers of Victoria, Oriental Mindoro. This may also improve their socio-economic environment and the future of the new generation.

Research Objectives

The study aimed to analyze the farmers' level of awareness on Integrated Diversified Organic Farming System or IDOFS. Specifically, it analyzed their profile in terms of age, sex, civil status, educational attainment, number of years in farming, land ownership, and number of hectares of cultivated land area; assessed the farmers' level of awareness on rice-fish-duck system, rice-pig-fish system, multi-storey cropping, three-strata forage system, agro-forestry, sloping agricultural land technology or SALT, sorjan cropping system, and balag palayan isda gulay *(vine trellis, rice field, fish, vegetables)* or balagdayan; and identified and analyzed the relationship between the level of awareness of the farmers and their profile variables.

Research Methodology

This study used the descriptive research method in a quantitative approach to clearly answer the research objectives. A total of one hundred eleven (111) farmers willingly participated and served as respondents. The sample size was identified through Raosoft calculator at 3% margin of error and

95% confidence level. They were from barangays San Narciso, Urdaneta, Malabo, Duongan, Mabini, Poblacion I, Poblacion II, Poblcaion III, Bagong Buhay, Alcate, Antonino, San Isidro, San Antonio, Bethel, Pakyas, Leido, and Bambanin, Victoria, Oriental Mindoro, Philippines. Survey questionnaire was the major data gathering instrument. It was validated by selected individuals knowledgeable in IDOFS. Twenty (20) farmers from the municipalities of Lian and Nasugbu, Batangas initially answered for reliability testing. It gained 0.98 Cronbach's alpha, which means that the instrument was well-prepared and good for administration. The statistical tools used to treat and interpret the data were percentage, frequency distribution, weighted mean, ranking, F-test analysis, and One-Way Analysis of Variance (ANOVA).

Results and Discussion

Profile of the Organic-Farmer Respondents

The first table presents the summary profile of the farmers.

Table 1. Profile of the Respondents

Profile Variables	Item Results	Frequency	Percentage
1. Age	41-50	31	27.5
2. Sex	Male	79	71.2
3. Civil status	Married	88	79.3
4. Educational attainment	High School Graduate	31	27.9
5. Number of years in farming	26-30	43	38.7
6. Land ownership	Tenant	50	45.0
7. Hectares of cultivated land	3 hectares or less	68	61.3

Most farmers were adults at around 41-50 years old (27.9%). Other age data of the farmers include 51-60 at 28 or 25.2%; 31-40 at 26 or 23.4%; 61 and above at 18 or 16.2%; and 21-30 at 8 or 7.2%. The older farmers could be more enthusiastic and exposed in farming and only few from middle-aged are doing the same thing. According Elauria (2015), the average age of the farmers is usually ranging from 57 years old. Young and educated people do not see farming as a professional work or field. It has become less attractive to the youth. They do not choose farming as their field in the future.

Moreover, it was revealed that almost 3/4, 80 or 72.1%, of the organic farmers are male. There were only 31 female or 27.9%. This means that male farmers could be more engaged when it comes to farming. Alesina, Giuliano, & Nunn (2011) said in their research that women are commonly active and participative inside their homes and they have the tendency to stay indoors. Their husbands are doing the much more energy consuming job for the family.

Eighty-eight (88 or 79.3%) of the organic-farmer respondents are married, 13 or 11.7% are single, 9 or 8.1% are widowed or widower, and 1 or .9% is separated. Farming is the main source of income of their families to sustain their needs to survive in their everyday living. The study of Tisdell & Kiriti (2003) disclosed that married farmers have more hours to spend in the farm than the unmarried ones. They help their spouses in agricultural works. They usually divide the work in terms of crop management and livelihood income.

In educational attainment, most of the respondents were high school graduates (31 or 27.9%). It was followed by 25 college graduates or 22.5%, then 19 elementary graduates or 17.1%, 15 elementary undergraduates or 13.5%, 12 high school undergraduates or 10.8%, and 9 college undergraduates or 8.1%. These results also show that most of them may not had the opportunity to pursue college or tertiary level and earn a bachelor's degree. The study of Lago (2017) disclosed that farmers who have attained secondary education mostly learned by attending seminars, trainings, and workshops. It may be enough for them that they could actively participate, do farm work, and learn through non-

formal education modalities. With regards to number of years in farming continuously spent by the respondents, 43 or 38.7% had been into farming for 26-30 years, followed by 24 or 21.6% for 5-10 years, 18 or 16.2% for 11-15 years, 14 or 12.6% or 16-20 years, and 12 or 10.8% for 21-25 years. This evinces that most of the respondents dedicated their life to farming.

According to Peeters (2019), many small to medium-sized farms provide better income and more jobs and are more resilient than big farms. The key to their success was the adoption of agro ecological and organic practices. It is a win-win situation for farmers and citizens, the environment and prospering rural areas.

Fifty (50) respondents or 45% are tenants or they do farming through tenancy, 36 or 32.4% own the farm they cultivate, 17 or 15.3% are renting the farm land, 6 others or 5.4% identified that they could have personal arrangements, and 2 or 1.8% identified themselves as landlords. Most of the farmers depend on land tenancy. This could possibly mean that they have no land to cultivate on their own. Koirala, Mishra, & Mohanty (2014) in their research found out that land ownership is one of the greatest factors to the productivity of the farmers in terms of its efficiency in their field.

Farmers are less productive if they are only leasing compared to the ones who own and utilize it. Some farmers have never owned a land. It led them to rent or become a tenant in order to provide the basic needs of their families. In addition, increasing population growth and continuous construction of new infrastructures are factors of decreasing land areas for agricultural farming.

Most farmers (68 or 61.3%) are cultivating 3 hectares or less farm land. This was followed by 3.1-6 hectares (27 or 24.3), and above 6 hectares (16 or 14.4%). This means that most of them are small-scale farmers. Lowder, Skoet, & Raney (2016), disclosed that most farmers with 3 hectares and less are considered as small-scale farmers. They are commonly cultivating or farming the land to sustain the everyday needs of their family.

Level of Awareness of Farmers on Integrated Diversified Organic Farming System or IDOFS

Table 2. Farmers' Level of Awareness on Rice-Fish-Duck System

Items	Mean	Verbal Interpretation
1. Produced products and crops provide a healthy food for the consumers	2.25	Not Aware
2. Enhances soil productivity	2.23	Not Aware
3. Helps control pests at a low cost	2.22	Not Aware
4. A sustainable approach to rice ecology and aquatic biodiversity conservation	2.18	Not Aware
5. Helps the environment by avoiding to purchase chemically-made pesticides	2.06	Not Aware
Composite Mean	**2.19**	**Not Aware**

Rice-fish-duck system

Table 2 shows that the farmers were relatively unaware about the rice-fish-duck system. One factor could their low level of education. It could be noted that only 25 farmers or 22.5% are college graduates. This could be supported by the study of Ulimwengu & Badiane (2010) cited by Bosma, Nhan, Udo & Kaymak (2012) that that a higher level of education matters for the adoption of innovations. The level of know-how on the sub-systems rice and fish was also higher for adopters. The Rice-Fish-Duck Symbiotic System is the direct result of their ancestral wisdom. Traditional varieties of glutinous rice have been preserved, and are cultivated on terraces where they also breed fish. When the fish grow to ten centimeters in size, ducklings are introduced to the terraced fields for breeding (Rong & Dayuan, 2019).

Table 3. Respondent's Level of Awareness on Rice-Pig-Fish System

Items	Mean	Verbal Interpretation
1. Installed pig pen over the trench; waste matters will fall directly into the water	2.53	Aware
2. Supplements income and improves nutrition through pig and fish culture in the rice field.	2.41	Not Aware
3. Improves the quality of rice crops	2.41	Not Aware
4. Maximizes land use by combining rice, pig, and fish enterprises	2.36	Not Aware
5. Pig pen has an installed pipe for the pig manures going to the trench of fishes	2.25	Not Aware
Composite Mean	**2.39**	**Not Aware**

Rice-Fish-Pig System

The 3rd table discloses that the farmers were not aware on rice-pig-fish system. Probably, they are not engaged with various farming systems and methods, or very few are open to practice it. They may be comfortable with the traditional agricultural methodologies. According Organization for Economic Co-operation and Development or OECD (2021), the adoption of technologies for sustainable farming systems is a challenging and dynamic issue for farmers, extension services, agri-business and policy-makers. The agricultural sector needs to employ a wide range of evolving technologies and farm practices across many different farming systems and structures to meet a variety of changing and heterogeneous demands from consumers and the public for food, fiber and other goods and services provided by agriculture, often with uncertain outcomes in terms of their effects on sustainability. Rice-fish system is an integrated rice field or rice field or pond complex, where fish are grown concurrently or alternately with rice. Fish may be deliberately stocked like fish culture, or may enter fields naturally from surrounding water ways when flooding occurs like rice field fisheries, or a bit of both. Rice-fish systems allow the production of fish and other aquatic animals, from the same rice field area and generally without causing reductions in rice yields. This source of animal protein may be important for household nutrition and farm income (IRRI Rice Knowledge Bank).

Table 4. Farmers' Level of Awareness on Multi-Storey Cropping System

Items	Mean	Verbal Interpretation
1. Improves crops or forage quality and quantity by enhancing climatic conditions.	2.35	Not Aware
2. Provides habitat for animals and other species beneficial to crops or forage	2.31	Not Aware
3. Improves the utilization and recycling of soil nutrients for crops or forage.	2.30	Not Aware
4. Reduces excess subsurface water or controls the level of water.	2.29	Not Aware
5. Produces wood or tree products together with crops or forage	2.28	Not Aware
Composite Mean	**2.31**	**Not Aware**

Multi-Storey Cropping System

Table 4 evinces that the level of awareness of the farmers on multi-storey cropping System is relatively low due to their unawareness to it. Mostly of the farmers are focused and comfortable in cultivating one crop only. They also think that the survival of pests become easy; pests can easily shift from one crop to another crop; problem of weed management; and implementation of new technology is difficult, and others. Some of these problems were also identified un the research of Arida (2009) that there were several problems besetting the rice industry in the Philippines. These

common problems encountered by rice farmers were high cost of inputs, low price of palay, lack of capital, labor problem, lack of postharvest facilities, pest and diseases and irrigation system. Lack of capital, pests, and diseases significantly affect production during wet season. Irrigation system is a significant factor for both seasons. Multi-storey cropping system is basically growing plants of different heights in the same field at the same time utilizing varying heights, root depths and crop canopy. It requires systematic planning with regard to selection of crops, planting, manuring and other management practices. This system is advantageous to do because it gives maximum production from small plots which can help farmers cope with land shortages along with income per unit area increase substantially; minimizes the risk of crop yield loss; improves physical properties and health status of the soil; including legumes in the cropping pattern helps maintain soil fertility by nitrogen fixation in the soil; different types of crops can be produced thereby providing a balanced diet for the family; weeds are suppressed due to high density planting; saves the crop from climatic aberrations like high rainfall, soil erosion, landslides etc.; maintain an ecological balance; provides suitable micro-climate conditions that benefits the winter crops; efficient use of resources available; and helps in maintaining ecological balance (Dutta & Gogoi, 2020).

Table 5. Farmers' Level of Awareness on Three-Strata Forage System

Items	Mean	Verbal Interpretation
1. Helps to increase food production, animal conservation, and safe environment.	2.41	Not Aware
2. Combination of the crops and animal in this method is a sustainable system.	2.37	Not Aware
3. Enhances the crop production and animal integration	2.35	Not Aware
4. Produces legumes that make the soil healthy and prevent soil erosion.	2.30	Not Aware
5. Increases livestock and crop production leading to a higher income	2.30	Not Aware
Composite Mean	**2.34**	**Not Aware**

Three-Strata Forage System

Table 5 shows that the farmers were not aware on three-strata forage system because they were practicing rice production only. They sometimes do crop production but still, rice production is their utilized main farming system. Nitis *et al.,* (1989) cited by Hasan, Masuda, Shimojo, & Natsir (2005) mentioned in their research that three strata forage system reduces soil erosion, increases soil fertility and soil organic matter, and improves physical structure of the soil organic matter and the physical structure of the soil. It also helps in soil recovery, prevents soil destruction, and enhances soil fertility. It makes the forage both in quantity and quality, available along the year. With the benefits abovementioned, it may be highly recommended that the famers may undergo training and learn three strata forage system.

Table 6. Farmers' Level of Awareness on Agro-Forestry System

Items	Mean	Verbal Interpretation
1. Increases biodiversity and reduces erosion.	2.52	Aware
2. Helps in reducing poverty; increases production of wood and other products	2.39	Not Aware
3. Increases food security; improves fertility of soil for crops.	2.39	Not Aware
4. Reduces deforestation by providing woods for fuel from the farm	2.33	Not Aware
5. Reduces the use of toxic materials like synthetic fertilizers, insecticides, pesticides, etc.	2.30	Not Aware
Composite Mean	**2.39**	**Not Aware**

Agro-Forestry System

Table 6 shows that the farmers were unaware about agro-forestry system. This could be possible because they may lack the formal learning platforms about such organic systems. In the published research of Oelbermann (2017), it was described that agroforestry systems are land management practices in which trees and shrubs are produced on the same land area as agricultural crops or livestock. It combines trees, crops, or livestock to increase diversity, productivity, profitability, and environmental stewardship. It can provide a sustainable alternative to biologically simplified or low diversity cropping systems. It is also suited for the rejuvenation of marginal land in both temperate and tropical biomes. Improved soil quality, through organic matter input from trees and crops lead to increased crop yield, ensuring the long-term security of food and soil. The tree and soil component of agroforestry systems can also be a long-term sink for carbon, thereby contributing to climate change mitigation. Cited also by Oelbermann (2017) that in 2013, the United Nations Federation of Agriculture Organization (UN-FAO) recommended the adoption of agroforestry practices for food security and the need for developing country governments to incorporate agroforestry into their national agricultural policies. Agroforestry systems are also of interest since they can offset the need for deforestation in tropical environments. It was estimated that for each hectare of sustainable agroforestry production, up to twenty hectares of deforestation could be prevented. Agroforestry systems also have other environmental benefits. These include reduced nutrient leaching and soil erosion, maintenance of nutrient cycling, reduction of weeds and pests, enhanced soil water availability and enhanced biodiversity. Agroforestry provides a more diverse farming system, thereby reducing economic risks due to the production of multiple products. This also helps to stimulate the rural economy.

Table 7. Farmers' Level of Awareness on Sloping Agricultural Land Technology (SALT) System

Items	Mean	Verbal Interpretation
1. Restores soil structure and fertility which controls soil erosion.	2.14	Not Aware
2. Maximizes the upland farm utilization by planting shrubs, crops, and legumes.	2.13	Not Aware
3. Economically feasible and possible for farmers' adoption without making loans.	2.11	Not Aware
4. Culturally acceptable and requires minimal labour in a relatively short time.	2.05	Not Aware
5. Provides crops that can be cyclically harvested throughout the year	2.00	Not Aware
Composite Mean	**2.08**	**Not Aware**

Sloping Agricultural Land Technology (SALT) System

Table 7 presents the unawareness level of the farmers to sloping agricultural land technology system of SALT system. Most of them are residing in the lowland areas. It is said that SALT system could be best practiced in the upland areas. Watson (2018) disclosed that to practice this system, the location must be in the upland areas. In the case of the farmers in this study, Victoria, Oriental Mindoro, and the whole Philippines is considered as a predominantly upland country. Upland areas are regions where agriculture and forestry are both utilized with slopes. ECHO Community described SALT is a package technology of soil conservation and food production, integrating differing soil conservation measures in just one setting. It is basically a method of growing field and permanent crops. The nitrogen fixing trees are thickly planted in double rows to make hedgerows. It is a diversified farming system which can be considered agroforestry since rows of permanent shrubs like coffee, cacao, citrus and other fruit trees are dispersed throughout the farm plot. The strips not occupied by permanent crops, however, are planted alternately to cereals like corn, upland rice, sorghum, and others or other crops like sweet potato, melon, pineapple, castor bean, and legumes

like soybean, mung bean, and peanut. This cyclical cropping provides the farmer some harvest throughout the year. SALT also includes the planting of trees for timber and firewood on surrounding boundaries. Moreover, the ECHO Community enumerated the advantages in utilizing SALT system: it protects the soil from erosion; helps restore soil fertility and structure; efficient in food crop production; applicable to at least 50% of hillside farm; easily replicated by hillside farmers; culturally acceptable because the farming techniques are in harmony with Asian beliefs and traditional practices; has the small family as its focus, and food production as the top priority–fruit trees, forest and other crops are secondary priority; workable in a relatively short time; economically feasible; ecologically sound; can easily revert back to forestland if left unfarmed.

Table 8. Farmers' Level of Awareness on Sorjan Cropping System

Items	Mean	Verbal Interpretation
1. Stores water in the sink which can be later used for irrigation	2.30	Not Aware
2. Increases food productivity both in flood-prone and drought-prone areas	2.26	Not Aware
3. Insures regular income and production through vegetable productions, etc.	2.23	Not Aware
4. Holds water can be used for rice production and other crops including *kangkong*, *gabi*, or for fish production	2.23	Not Aware
5. Utilizes raised dry land beds which are constructed in making the sink to allow planting of vegetables and cash crops	2.20	Not Aware
Composite Mean	**2.25**	**Not Aware**

Sorjan Cropping System

Table 8 shows that the level of awareness of the farmers on sorjan cropping system was low because they are not aware of it. Their engagement mostly is on tice and crop production. They don't usually have a fish pond. According to Arcalas (2016) the main asset of sorjan cropping system is with the utilization of deep sink and raised bed. It can be used for rice or fish production, as well as dry land beds within the pond for vegetables and cash crops. The adoption of the land use system called Sorjan Farming System would be able to make lands suitable for agricultural purposes, by preventing further degradation as well as regeneration of the diminished natural eco-system of the coastal low-lying areas. Further, it would be able to provide the people with a variety of food and additional cash income, which would help to maintain active involvement of the people in return. Sorjan farming is an integrated system of crop and fish cultivation in parallel beds and sinks. Lowland crops and fish are cultivated in sinks and upland crops on beds.

Table 9. Farmers' Level of Awareness on Balag, Palayan, Isda, Gulay or Balagdayan

Items	Mean	Verbal Interpretation
1. Secures crop production and provides enough food for the consumers.	2.33	Not Aware
2. Helps to increase income and sustains consumers' needs.	2.22	Not Aware
3. It is climate resilient and secures food supply	2.11	Not Aware
4. Economically accepted, multiple crop production, space maximization, and land utilization.	2.11	Not Aware
5. Provides eco-friendly methods and procedures to sustain crop production	2.07	Not Aware
Composite Mean	**2.17**	**Not Aware**

Balag, Palayan, Isda, Gulay *(vine trellis, rice field, fish, vegetables)* BALAGDAYAN System
Table 9 shows the level of awareness of the farmers on BALAGDAYAN System, and they are not aware of it as evinced by the composite mean. It could be noted that the farmers participating in this research are focused on rice and crop production. That is mainly their focus. Some have their fish ponds as well for fish production purposes. It only constitutes partial parts of the farming system.

If specifically the small-scale farmers would engage in such diversified agricultural system, then, it would be possible for them to enjoy the advantages of agricultural development particularly increased income, food security, and generally the basic family needs. Corales, *et al.,* (2005) disclosed in their research that diversified farming systems can sustain most of a family's food requirements, incidental expenses and generate reasonable net income from the different crops and animals.

The application of cost-saving and yield-enhancing practices enhance the efficiency of operations in the farm, making it more economically stable. Regular evaluation of the performance of each component is important to make necessary adjustments to fit the local conditions and stability of the system.

In addition, Freed, *et al.,* (2020) concluded in their online research article that integrated and agro-ecological rice-fish production practices can contribute to productivity and income for small-scale food producers and to ecosystem maintenance and capacity for adaptation to climate change and natural disasters, in alignment with SDG targets 2.3 and 2.4.

Implementation of the five shifts that they proposed for food system transformations could maintain or further improve sufficient rice yields and production of rice and fish. These shifts support ecological integrity and biodiversity conservation alongside the provision of a broad range of nutrition and livelihood benefits, commensurate with a holistic vision of sustainable food systems.

Table 10. Summary of the Farmers' Level of Awareness on IDOFS Components

IDOFS Components	Composite Mean	Verbal Interpretation
1. Rice-Fish-Duck System	2.19	Not Aware
2. Rice-Pig-Fish System	2.39	Not Aware
3. Multi-Storey Cropping System	2.31	Not Aware
4. Three-Strata Forage System	2.34	Not Aware
5. Agro-Forestry System	2.39	Not Aware
6. Sloping Agricultural Land Technology System	2.08	Not Aware
7. Sorjan Cropping System	2.25	Not Aware
8. Balag, Palayan, Isda, Gulay *(vine trellis, rice field, fish, vegetables)* (BALAGDAYAN) System	2.17	Not Aware
Grand Mean	**2.27**	**Not Aware**

The grand mean 2.27 on Table 10 summarized that the farmers are not aware about IDOFS specific components. According to De Guzman *et al.,* (2015), the IDOFS is commonly used by small-scale farmers. It is not known in all regions of the country, or farmers don't engage to it. It is practiced in some parts of Cavite, Philippines. IDOFS components are practiced separately by farmers.

IDOFS could be a new farming strategy for them, that could be the probable reason why they are a little bit doubting and uncomfortable adapting this organic agricultural system. On the other hand, Nelson *et al.,* (2018) concluded in their research that organic farming technology is perceived to be a solution to restore soil fertility to achieve food security in the long term.

Positive attitude coupled with knowledge would lead to practice. The study also found that some characteristics are related to knowledge and attitude. Highly educated organic farmers are likely to be more knowledgeable on both organic farming in general and on the aspect of environment. Engaging in organic farming practice is profitable since farmers who sell organic produce registered high knowledge mean scores on the cost and benefit aspects of OA.

Attendance on trainings is the main source of knowledge. However, attending orientation on OA is not enough to contribute to their knowledge on the environment, in fact it is negatively related to attitude on OA and benefit and cost. Undeniably the contribution of trainings and seminars to knowledge of organic farming is supported in this study.

The profile of organic farmers by province provides important inputs in the designing custom-made trainings and seminars. Need-based training programs for organic farmers means customizing the trainings according to the characteristics, attitudes, knowledge and practices to make it more appealing to the organic farmers who are still reluctant to convert to organic farming.

Relationships between the Farmers' Level of Awareness and their Profile Variables

This shows the relationships between the respondents' level of awareness on IDOFS components and their profile variables according age, gender, and civil status, and educational attainment, number of years in farming; land ownership, and number of hectares of cultivated land area. The numerical data in bold font style are the entries verbally interpreted as significant, and the rest numerical data not in bold font style were all not significant.

Age, sex, and number of years in farming had no significant relationship with any of the IDOFS component systems. This is true because all people, whether young or old, male or female, or had been into farming for a short or long period of time, need food; we all have to eat food every day. It could be noted that the main findings of Serebrennikov, Thorne, Kallas, & McCarthy's (2020) study show that farmers' environmental and economic attitudes, and not the age, in addition to their sources of information have a strong effect on the adoption of organic farming.

Moreover, civil status had a significant relationship with three strata forage system. 88 or 79.3% of the farmers who participated in this study are married. This means most of them are tied with great responsibility, and that is to provide the needs like food and shelter, of their respective families, more especially their children.

The research of Badstue, Petesch, Farnworth, Roeven, & Hailemariam (2020) disclosed that single women are more likely to own land and experience control over their production decisions and expenditures than married women, but engage in considerable struggle to obtain resources that should be theirs according to the law. With this married women farmers would become more concern and focus to strive harder for the benefit of their children.

In addition, even when land is secured, customary norms often hamper women's effective use of land and their ability to innovate. Still, some single women do succeed. Married women can innovate successfully provided they are in a collaborative relationship with their husbands.

At the same time, the farmers' level of awareness particularly on rice-fish-duck system and sloping agricultural land technology or SALT had significant relationship with their educational attainment. This could be further explained and supported by the study of Paltasingh & Goyari (2018) which says that education enhances farm productivity in the case of adopters of modern technology. They also suggested that farmers' field school program must be implemented along with a strong extension network in the study region for a wider dissemination modern technology.

Table 11. Summary of Relationships between the Farmers' Level of Awareness and their Profile Variable

IDOFS Components	Age		Sex		Civil Status		Educational Attainment		Number of Years in Faming		Land Ownership		Hectares of Cultivated Land	
	Computed f- Value	p-value	Computed f- Value	p-value	Computed f- Value	p-value	Computed f- Value	p-value	Computed f- Value	p-value	Computed f- Value	p-value	Computed f- Value	p-value
Rice-Fish-Duck System	.878	.480	0.060	.942	2.472	.066	**2.754**	**.016**	1.481	.213	**2.523**	**.045**	.195	.823
Rice-Pig-Fish System	.234	.919	.437	.647	1.434	.237	2.875	.012	1.066	.377	**3.485**	**.010**	.709	.495
Multi-Storey Cropping	.787	.536	.359	.699	1.149	.333	2.544	.024	.651	.628	**2.486**	**.048**	.230	.795
Three-Strata Forage System	1.996	.100	.004	.996	**3.900**	**.011**	1.455	.201	.964	.430	2.077	.089	2.557	.082
Agro-Forestry	.680	.608	1.075	.345	.883	.452	3.858	.002	1.213	.310	2.309	.063	1.806	.169
Sloping Agricultural Land Technology (SALT)	1.812	.132	.861	.426	2.286	.083	**2.302**	**.040**	1.017	.402	1.540	.196	.363	.697
Sorjan Cropping System	1.494	.209	.434	.649	1.652	.182	2.178	.051	1.319	.267	.916	.457	**3.739**	**.027**
Balag, Palayan, Isda, Gulay (Balagdayan)	2.148	.080	.466	.628	3.761	.013	2.027	.068	1.756	.143	**2.684**	**.035**	.431	.651

Moreover, land ownership landed to have a significant relationship with their level of awareness particularly on rice-fish-duck system, rice-pig-fish system, multi-storey cropping, and balag, palayan, isda, gulay or balagdayan. This is absolutely true because, farmers need a good land or place where they can do such agricultural activities like the various IDOFS components. This is strongly supported by the study of Koirala, Mishra, & Mohanty (2016) that land is a key factor in production agriculture and the land rental market is an important institution in agriculture. Rental activity of both sharecropped and fixed rent arrangements represents about 25% of cultivated land in the Philippines. They also identified that land ownership has a significant impact on technical efficiency. Lastly, it was found out that the farmers' level of awareness on IDOFS components, particularly in sorjan cropping system was significant relationship with their hectares cultivated land area. This could be further strengthened by the study of Noack and Larsen (2019) that agricultural incomes increase with farm size. While the variance of agricultural incomes declines with increasing farm size, the variance of local food production increases with farm size. It suggests that farmers benefit from larger farms, earning higher and more stable incomes while consumers suffer from lower and more volatile food supply.

Conclusion

Most of the farmers who participated in this research were at middle age adulthood or 41-50 years old, male, married, high school graduates, had been into farming for 26-30 years, into tenancy, and cultivating farm land at an average of 3 hectares of less. They were basically all unaware on the various IDOFS of integrated diversified organic farming systems particularly the rice-fish-duck system, rice-pig-fish system, multi-storey cropping system, three-strata forage system, agro-forestry system, sloping agricultural land technology system, sorjan cropping system, and balag, palayan, isda, gulay (BALAGDAYAN) system. Lastly, in terms of the relationship between the farmers' awareness on IDOFS components and their profile variables, all were not significant except from items with significant relationships like civil status and three strata forage system; education attainment with rice fish duck system and sloping agricultural lang technology or SALT; land ownership with rice fish duck system, rice fish pig system, multi storey cropping, and balag, palayan, isda, gulay (BALAGDAYAN) System; and finally, sorjan cropping system with number of hectares of land cultivated by the farmers.

Recommendation

The grand mean of 2.27 means that the farmers who participated in this research were relatively unaware of the various IDOFS components, that is and if would be practiced, could expect good harvest, source of livelihood and increased income, enjoy healthy food, contribute to adaptation and mitigation of climate change, and generally advocate agriculture sustainability. Designing a community extension program is highly recommended to be proposed. This program shall contain the various ways and means, processes and methodologies on the appreciation, knowledge enhancement, and engagement of farmers including the interested groups and individuals in the communities. In addition, civil status, education, land ownership, and hectares of land cultivated by the farmers shall be given attention and consideration in designing the extension program proposal, as these profile variables were deemed significantly related to some specific IDOFS components.

Conflicts of interest

The authors declare no conflicts of interest.

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Citation: Benedict O. Medina, Jenica Czarina B. Mendez and Keziah Lei S. Sarmiento. 2021. Farmers' Awareness on Integrated Diversified Organic Farming Systems. International Journal of Recent Innovations in Academic Research, 5(12): 01-15.