Socio-Economic Effect of Farmer Field School (FFS) on Rice Farmers in the Municipality of Pres. Manuel A. Roxas, Zamboanga Del Norte

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ABSTRACT

Rice (*Oryza sativa*) is the primary staple food and an important agricultural commodity in the Philippines. This study assessed the socioeconomic effects of the Farmer Field School (FFS) program on rice farmers in the Municipality of Pres. Manuel A. Roxas, Zamboanga del Norte. A descriptive-quantitative research design was employed, involving 89 registered rice farmers who had completed FFS training in three purposively selected barangays. Data were collected using a structured survey questionnaire and analyzed through frequency counts, percentages, weighted means, a paired-samples t-test, and Somers' D. The findings revealed that most respondents were older adults, female, married, elementary graduates, and primarily dependent on farming for their livelihood. The FFS technologies had an overall very large perceived effect on farming practices (AWV = 4.43), particularly in growing healthy seedlings, nutrient management, pest management, and harvest management. The program also produced a very large social effect (AWV = 4.40) and a large economic effect (AWV = 4.13), enabling farmers to better provide for their families' education, nutrition, health, sanitation, housing, and other essential needs. Farmers' average monthly income significantly increased from ₱4,797.75 before the program to ₱8,370.14 after its implementation ($p < .001$). Moreover, FFS technology transfer was positively and significantly associated with socioeconomic improvement (Somers' $D = 0.257$, $p = .003$). The study concludes that the FFS program effectively strengthens farmers' agricultural knowledge and practices while contributing to improved income and household well-being. Its continued implementation and expansion, supported by regular follow-up training and agricultural extension services, are therefore recommended.

Keywords: Farmer Field School, rice farmers, socioeconomic effects, technology transfer, income improvement, sustainable rice farming

INTRODUCTION

Rice (*Oryza sativa*) is a staple grain typically grown in warm, wet environments.It is the main food source and a vital commodity in the Philippines (Casinillo, 2020). Rice farming is really important in the Philippines for both food and the economy. But farmers face problems like low yields, environmental damage, and lack of new farming knowledge and techniques. To fix this, we need new ideas to help farmers learn better and farm sustainability. The Department of Agriculture implemented a program called Farmer Field School to train farmers on farming technology and sustainability.

The Farmer Field School (FFS) is a program that focus on learning by doing in actual fields, giving farmers practical skills they can use right away. This method of training was designed to help the farmers understand sustainable farming, managing pests better, and using resources wisely, which are all key to growing more crops and taking care of the environment. The FFS model is intended for groups of farmers who meet routinely with a trained facilitator in practical, field-based sessions during an entire production cycle (Pontius et al. 2002). It has been widely used method in rural development seeking to educate farmers to adapt their agricultural decisions to diverse and variable field conditions (Pontius et al. 2002; FAO 2016a). The FFS was

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originally developed by the Food and Agriculture Organization (FAO) in the 1980s, in response to the negative side effects of the Green Revolution in Southeast-Asian rice production (Gallagher et al. 2009; Kenmore et al). It aims to help farmers learn better ways to grow their crops. It uses real fields as classrooms where farmers can see and practice new techniques. The FFS approach utilizes hands-on group learning, enhancing skills for observation and critical analysis and improved decision making by local communities. FFS not only improves farming practices but also strengthens communities by encouraging teamwork and sharing knowledge. It boosts productivity but also have wider social benefits. The project brings farmers together, encouraging community involvement, sharing of knowledge, and working together to solve problems. This teamwork makes communities stronger and helps improve the lives and well-being of farming families. Even though FFS offers many benefits, there is a need to thoroughly evaluate their impact on rice farmers. This evaluation determines how well the FFS programs work, reveal best practices, and identify areas that need improvement. This study helps fill gaps in current research and provide evidence-based advice for policymakers, development agencies, and agricultural educators to improve FFS programs. By studying the effects of Farmer Field Schools (FFS) on communities, this research aimed to support sustainable farming, reduce poverty, and improve food security in the Philippines. The results help create better FFS strategies so rice farmers can get the most out of this modern learning method.

Significance of the Study

The significance of this study included both theoretical and practical contributions. The study provided valuable insights into the current situation of farmers and their needs, which added knowledge that can serve as a basis for improving agricultural practices and support systems. Farmers benefited by gaining new skills and becoming more confident in their farming techniques. The Local Government Unit (LGU) also benefited, as the findings helped them better understand farmers' needs and formulate effective programs and policies that enhance food security, boost local economies, and promote community development. Furthermore, JRMSU-K gained from this study as the results guided the institution in developing more effective training programs for farmers. This strengthened the link between academic knowledge and practical application, enabling students and educators to see the real-world impacts of their lessons. As a result, JRMSU-K can play a leading role in extending agricultural knowledge to the community. Lastly, future researchers may use the findings of this study as a valuable reference in conducting related studies about farmers in Pres. Manuel A. Roxas.

Objectives:

This study aimed to evaluate the socio-economic effect of farmer field school (FFS) on rice farmers in the municipality of Pres. Manuel A. Roxas, Zamboanga del Norte.

1. Determine the profile of the respondents in terms of age, sex, civil status, educational attainment, religious affiliation, family size, number of years in rice production, main source of income, other source of income before program implemented, monthly income, house ownership, type of house, ethnic origin, number of years in rice farming, number of hectares in rice farm, and farmer classification.
2. Determine the level of effectiveness of the FFS technology to the rice farmers.
3. Determine the effect of the FFS to the rice farmers in terms of social effect and economic effect.
4. Determine the significant difference in the income of the rice farmers before and during the implementation of farmer field school.
5. Determine the significant relationship between the technology transfer by FFS and the level of socio-economic effect.

REVIEW OF LITERATURE

Rice Production

According to Palanog et al. (2020), rice is a major staple in the Philippines. The major goal of the rice sector in the country is to increase rice productivity to meet the ever-growing demand for rice. The demand for rice continues to increase as population constantly grows at a rate of 1.7% every year. Increasing productivity is

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one of the top priorities in rice breeding to address the consumption demand of the country. Generally, breeding in the country is directed to achieve desirable traits such as high grain yield, resistance to biotic and abiotic stresses, wide adaptability, and grain qualities acceptable to consumers. Lead breeding institutions like the International Rice Research Institute (IRRI), Philippine Rice Research Institute (PhilRice), University of the Philippines (UPLB) have developed varieties intended for various rice ecosystems (irrigated lowland, rainfed, upland, saline-prone, cool-elevated) and are adaptable for various locations (regional, national). Moreover, rice, the staple food for nearly half the world's population, and its continued increased production to meet the enhanced demand due to ever-increasing population faces many challenges. The result of their study is rising temperatures and changing rainfall patterns could reduce global rice yields by 3.4% to 10.9% by the end of the century, with potential declines of up to 40% in some regions. Additionally, a shift in labor availability towards urban sectors is causing delays in harvesting and increasing post-harvest losses, which necessitates modernization in harvesting practices. Furthermore, there is a critical need for improved agricultural technologies and practices to enhance productivity and sustainability in rice farming (Prasad, R., et al., 2017). Research underscores the critical importance of developing high-yield varieties that are resilient to the fluctuations brought about by climate change. A comprehensive analysis conducted by Ansari et al., (2021) explores into various breeding programs designed to enhance rice varieties, enabling them to withstand adverse environmental conditions while maintaining high productivity levels. These high-yield varieties are important in strengthening food security, particularly as they are engineered to thrive under increasingly common stressors such as drought and flooding, which are worsened by climate change. Furthermore, a study by Reza et al., (2022) examines the extensive impacts of climate change on rice production and food security, revealing how shifts in climatic conditions can adversely affect not only the yield but also the nutritional quality of rice. This research highlights the necessity for a multifaceted approach to rice research and production—one that considers both quantity and quality. The findings indicate that integrating improved agronomic practices with high-yield, climate-resilient varieties is essential for ensuring sustainable rice production in the future.

Farmers Field School (FFS)

The idea of FFS began in the 1980s as a response to the negative effects of the Green Revolution in Southeast Asia. The Green Revolution introduced high-yielding crops, synthetic fertilizers, and pesticides to boost food production. While it increased crop yields, it also led to environmental problems like soil degradation, water pollution, and overuse of chemicals (Gallagher et al., 2009). In response, the Food and Agriculture Organization (FAO) created the FFS model to teach farmers more sustainable farming methods. The first FFS programs were focused on rice farming in the Philippines, teaching farmers how to manage pests without using harmful pesticides. The goal was to help farmers make better, eco-friendly decisions and improve their farming practices (Pontius et al., 2002). The first FFS programs in the late 1980s were introduced in the Philippines under the FAO's Integrated Pest Management (IPM) program. IPM taught farmers to control pests by understanding their life cycles, using natural pest predators, and relying on fewer chemicals. This was different from traditional methods, which often depended heavily on chemical pesticides (Kenmore et al., 2006). The success of these early programs in the Philippines led to the spread of FFS to other countries in Southeast Asia. Farmers were able to improve their pest management and reduce pesticide use while learning more sustainable farming practices (Pontius et al., 2002). As FFS proved successful in the Philippines, it spread to other countries in Southeast Asia, including Indonesia, Thailand, and Vietnam. In these countries, the focus of FFS expanded from pest control to broader agricultural issues, such as water management, soil fertility, and crop rotation. FFS programs were adapted to local farming conditions, addressing specific needs like crop protection, water conservation, and environmental health. By the mid-1990s, FFS had reached countries outside Southeast Asia, including parts of Africa, Latin America, and the Middle East. In Africa, for example, FFS programs were introduced to help farmers improve food security and reduce reliance on harmful chemicals. The FFS model was tailored to the needs of these regions, focusing on crops like maize, beans, and cassava (FAO, 2016). One of the main ways FFS promotes sustainability is by teaching environmentally friendly farming practices, especially through Integrated Pest Management (IPM). IPM is a strategy that helps farmers manage pests without relying on harmful chemicals. Instead, it encourages farmers to use natural pest control methods, like using beneficial insects, rotating crops, or using resistant plant varieties. FFS programs in countries like the Philippines have shown that farmers can use fewer pesticides while still producing healthy crops. This reduces pollution, helps protect local ecosystems, and increases biodiversity (more different kinds

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of plants and animals) on farms. For example, farmers trained in FFS can reduce their pesticide use by up to 50%, which helps the environment and also saves them money (FAO, 2016). FFS also teaches practices like soil conservation and water management. Farmers learn techniques to protect the soil from erosion, conserve water, and improve soil health, which ensures their land remains fertile and productive over time (Kenmore et al., 2006). Despite the many benefits of Farmer Field Schools (FFS), there are several challenges that can make it hard for these programs to succeed in the long term by Lee et al., (2014) highlights some of these barriers that FFS programs often face. One major challenge is limited resources. Many FFS programs struggle with funding, which means they do not have enough money to provide continuous support and resources for farmers. Without adequate funding, FFS might not be able to hold regular meetings, hire knowledgeable trainers, or provide necessary materials for demonstrations. This lack of support can lead to a decrease in the quality of education offered, and eventually, farmers may not receive the benefits they hoped for. Another significant challenge is group participation sustainability. Keeping farmers interested and actively involved over time is crucial for the success of FFS. However, outside factors can impact their participation. For example, if the local market prices for crops drop, farmers might focus more on immediate economic needs rather than attending FFS sessions. Additionally, environmental changes, such as drought or floods, can mean that farmers have less time to dedicate to learning and may need to prioritize their immediate farming activities to survive. When participation decreases, the learning and knowledge-sharing benefits of FFS also decline. Lastly, there is a need for continuous training. Agriculture is always changing due to new technologies and practices. For FFS to remain effective, it must adapt its training to these changes. This means that regular updates and new information should be provided to farmers to keep them informed about the latest farming techniques, pest management, and market trends. If FFS does not offer ongoing training, it can become less relevant, and farmers may miss out on new opportunities to improve their practices.

Socio-economic Effect on Rice farmers

Farmer Field Schools (FFS) are very effective at helping farmers learn new skills and manage their crops better. According to Kumar and Singh (2013), farmers who participate in FFS significantly improve their understanding of how to grow upland rice. In FFS, farmers take part in hands-on activities that teach them important techniques like Integrated Pest Management (IPM) and sustainable farming methods. This active learning helps them make better choices about their farming practices. FFS also encourages farmers to work together and share what they learn, which builds a strong community. Van den Berg and Jiggins., (2007) highlight that FFS teaches farmers sustainable practices that not only increase how much food they grow but also protect the environment. These practices help improve soil quality and support plant and animal life. As a result, farmers can better handle challenges like climate change while increasing their crop production. The study by Davis et al., (2012) investigates how Farmer Field Schools (FFS) affect the learning and income of farmers. The researchers found that participating in FFS significantly improves farmers' knowledge and skills in agricultural practices. Through hands-on learning experiences, farmers learn important techniques that help them manage their crops more effectively. This kind of learning encourages farmers to actively engage with their work, analyze different methods, and make informed decisions about their farming strategies. One of the key findings of the study is that FFS not only enhances farmers' skills but also leads to increased income. Davis et al noted that farmers who participated in FFS reported higher crop yields and improved market access. As a result, these farmers could sell more produce and earn more money. This higher income enables farmers to invest in better seeds, tools, and other resources, which further boosts their productivity. It emphasizes the importance of group learning in FFS. By working together, farmers can share their experiences and learn from one another, creating a supportive community that fosters growth and innovation. This collective approach helps farmers solve problems together and encourages them to adopt new practices that can lead to better farming outcomes. The study by Pretty et al., (2003) investigates how social capital influences farmers' adoption of sustainable agricultural practices in Southern Africa. Social capital refers to the relationships and trust within a community. They found that strong connections among farmers encourage them to adopt sustainable farming methods. When farmers collaborate and share information, they learn more about new practices that benefit their farms and the environment. The study highlights that communities with high social capital are better at sharing valuable resources like tools and seeds, which leads to improved farming results. It shows that when farmers come together in groups, they discuss challenges and support each other in trying out sustainable practices. This peer support enhances individual skills and strengthens community resilience

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against agricultural challenges. Social capital allows farmers to advocate for their needs, such as better access to markets and government support. However, Pretty et al., (2003) note that building social capital takes time, and not all communities have the same level of trust and cooperation. Therefore, they suggest that programs designed to encourage social connections can help increase the adoption of sustainable agriculture. It emphasizes the importance of social capital in promoting sustainable farming practices, showing that strong community ties enable farmers to share knowledge and work together for better outcomes. Agarwal et al., (2015) explores the relationship between gender inequality and food security, focusing on women farmers in India. The study highlights the women plays important role in agriculture, yet they often face discrimination and lack access to important resources. Women farmers usually have less control over land, credit, and modern farming techniques compared to their male counterparts. This inequality limits their ability to produce enough food and earn a stable income. It shows that when women have better access to resources, it not only improves their own productivity but also benefits their families and communities. Empowering women farmers can lead to more food security for everyone because women are often responsible for feeding their families. The study emphasizes that addressing gender inequality is essential for improving food security in India. It suggests that policies should focus on supporting women farmers by providing them with equal access to resources and decision-making power.

Income of Rice Farmers on the Implementation of FFS

Rice farmers who participate in FFS programs tend to see improvements in their income over time, especially through better resource management. According to Singh et al., (2017), FFS programs help farmers adopt improved rice cultivation techniques, such as optimized water use and nutrient management, leading to cost savings and higher profits. These practices are critical in regions where input costs are high, as efficient resource use directly affects farmers' bottom line. This was attributed to several factors, including enhanced knowledge on water management (which led to better rice yields) and the adoption of efficient nutrient management practices. By optimizing input use, farmers were able to reduce costs while increasing yields. Farmers also reported increased confidence in their ability to make decisions regarding pest control and crop management, leading to reduced crop losses and better-quality rice. The long-term effects of FFS on rice farmers' income have also been explored. Berthelemy et al., (2020) found that while immediate income gains were significant in the short term, the sustainability of these income improvements required ongoing training and market access. In their study, they highlighted the importance of continuous education for farmers, noting that the long-term success of FFS in enhancing income is closely linked to sustained engagement and access to updated agricultural practices. The income gains from FFS were sustained over the long term, although they were less pronounced than in the initial years after participation. Farmers who continued to apply FFS practices, such as integrated pest management, improved water use, and soil fertility management, enjoyed consistent income increases. However, the study also highlighted the importance of continuous education and access to updated agricultural knowledge to maintain these gains. While FFS can significantly improve income, its success is also contingent on certain factors, including access to resources, market linkages, and continuous extension support. Nkonya et al., (2011) argue that in some contexts, the full potential of FFS to increase income may not be realized due to inadequate infrastructure, poor access to markets, and limited post-FFS support. These barriers need to be addressed for FFS to have a lasting and substantial impact on the income of rice farmers. The farmers who attended FFS, it highlighted several challenges that limited the overall success of the program in enhancing income. Key challenges included poor infrastructure (especially in remote areas), lack of access to reliable markets, and limited extension support after the conclusion of FFS programs. In many cases, farmers were unable to fully capitalize on the skills they gained during FFS due to these external limitations. Davis et al., (2012) discusses how FFS interventions, particularly in rice farming, have contributed to significant increases in farmers' agricultural productivity. They note that FFS promotes a deeper understanding of crop management, pest control, and sustainable agricultural practices, the study found that farmers who attended FFS were more likely to adopt integrated pest management (IPM) practices, reducing pesticide use and increasing profit margins due to lower input costs. In regions where climate change and market volatility pose risks to agricultural livelihoods, FFS programs can help rice farmers achieve more stable incomes. Hossain et al., (2018) found that through FFS, rice farmers in Bangladesh were able to develop adaptive strategies to cope with variable rainfall patterns and market fluctuations, which helped stabilize their incomes over time.

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Theoretical Framework

This study was anchored on Experiential Learning Theory and Social Capital Theory, that aims to empower farmers with practical, field-based education that can improve both their agricultural productivity and their social and economic standing. This theoretical framework explores how the FFS approach, by emphasizing learning through experience, community collaboration, and sustainable agricultural practices, leads to positive socio-economic changes for farmers, especially rice farmers. Experiential Learning Theory, introduced by David Kolb, focuses on the idea of learning through direct experience and thoughtful reflection. FFS is grounded in this, as it provides farmers with hands-on learning opportunities in their own fields. It encourages farmers to experiment, observe, and share their experiences. It also aims to build the capacity of farmers by enhancing their knowledge, skills, and competencies to improve their agricultural practices and productivity. Social Capital Theory focuses on the social relationships, networks, and norms that contribute to the development of social capital within a community. In the context of government program, it can be used to understand how social networks and collaborations among rice farmers, government agencies, and other stakeholders can enhance the success of rice production. It helps analyze the role of trust, reciprocity, and social support in achieving positive socio-economic outcomes.

Conceptual Framework

To conceptualize this study, Figure 1 shows the schematic diagram of the study. The first phase is the Input which is the farmers who have attended Farmer Field School (FFS). The arrow that points to the second phase is the process which represents the questionnaire for the information need to complete the study. The third arrow pointing to the last phase is the output that represents the Socio-Economic Effects on the Rice Farmers.

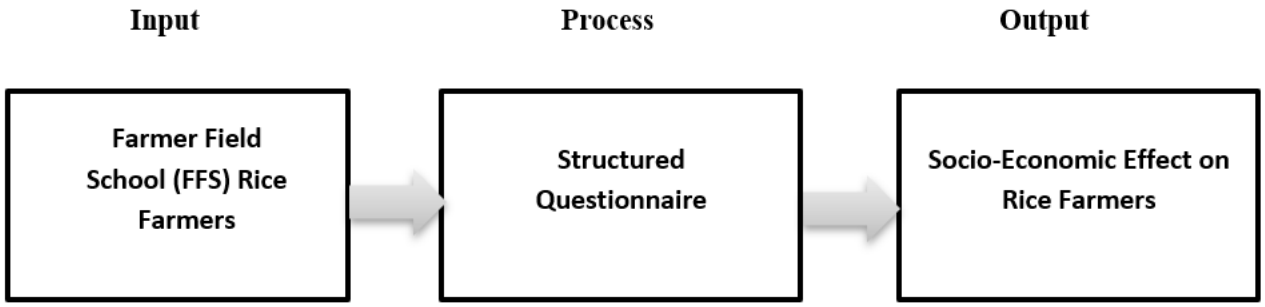

Figure 1. Schematic diagram of the study

METHODOLOGY

Method Used

The study utilized a descriptive-quantitative research design using survey method. It is descriptive because it described the effects of Farmer Field School on rice farmers. It is quantitative because it used numerical and measurable data, applying mathematical and statistical methods to present and analyze the findings. An adopted questionnaire used as the survey instrument for the respondents. A purposive sampling method used to select the respondents for the study.

Respondents of the Study

The respondents for this study were the registered rice farmers who have completed the FFS training in the Municipality of Pres. Manuel A. Roxas. A total of eighty-nine (89) respondents interviewed across three (3) selected barangays which is identified using purposive sampling method. These farmers were selected from various barangays where rice is cultivated.

Research Instrument

The study used an adopted questionnaire to gathered relevant information needed from the study of Tenido et

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al., (2024). Part two (II) of the questionnaire submitted for expert validation to assess its relevance, clarity, and alignment with the research objectives. The questionnaire for the rice farmers consists of the following parts: Part I-Profile of the respondents; Part II- What is the level of effectiveness of the package of technology trained in Farmer Field School (FFS); Part III- Socio-economic effects of farmer field school on rice farmers.

Statistical Treatment of the Data

The data gathered were analyzed using the following statistical tools:

Frequency Count and Percentage. It was used in profiling the profile of the respondents and to determine the adoption rate of field school practices.

Mean. It was used to determine the perceived effects of farmer field school on rice farmers in terms of social and economic effects.

T-Test. This was used to determine the significant difference in the income of rice farmers before and during the implementation of farmer field school (FFS).

Somers' D. It was used to measure the strength and direction of the association between farmers participation in the farmer field school and their socio-economic outcomes, such as income level and farming productivity.

RESULTS AND DISCUSSION

Table 1 presents the respondents profile in terms of age, sex, civil status, educational attainment, religious affiliation, family size, number of years in rice production, main source of income, other source of income before program implemented, monthly income, house ownership, type of house, ethnic origin, number of years in rice farming, number of hectares in rice farm, and farmer classification. In terms of age, it shows that most of the people in the study are older, with the largest group (30.34%) between the ages of 61 and 70, and another 14.61% aged 71 and above. This means that nearly 60% of the respondents are over 60 years old. People aged 51 to 60 make up 23.59%, while those between 41 and 50 are 12.36%. Younger age groups are much smaller, with only 13.48% between 31 and 40, and just 5.62% between 21 and 30. This suggests that older people are more involved in the activity being studied, and there are very few young people taking part, which could be a concern for the future if younger generations are not getting involved. This finding is supported by the studies of Agarwal (2015), which also showed that many farmers are older., suggests that older farmers may have a hard time learning new farming methods and technologies. Because of this, it is important to support and train farmers through programs like Farmer Field School (FFS) to help them stay productive, protect the environment, and ensure enough food for everyone. It also shows the profile of the rice farmers in Pres. Manuel A. Roxas, Zamboanga del Norte in terms of sex. The table shows that most of the rice farmers who joined the study are female, making up 61.79% of the total, while only 38.20% are male. This means that more women are involved in the Farmer Field School program in the Municipality of Pres. Manuel A. Roxas, Zamboanga del Norte. This may be because women in the area are more active in rice farming or more open to learning new farming practices through training. According to Rahman (2010), women in many rural areas play a big role in farming and often take part in programs that help improve their skills. This shows that women are a strong part of the farming community and should continue to receive support through programs like the Farmer Field School to improve their knowledge and increase their income.

When it comes to the civil status of the respondents, the table 4 shows that most of the rice farmers in the study are married, making up 74.16% of the total, while 14.61% are widowed. A smaller percentage of participants are single (8.99%) or separated (2.25%). This means that a majority of the farmers are in stable family situations, which could influence their involvement in agricultural activities. Married individuals may have additional responsibilities but also more support systems, while the higher percentage of widowed farmers could indicate that some are managing their farms independently. Understanding these social factors is important when analysing the socio-economic effects of the Farmer Field School program, as family status might influence how farmers approach training, adopt new practices, or manage their income. According to FAO (2011), the majority of respondents are married, the findings imply that farmer field school can help married and widowed farmers by improving farming techniques and social networks through cooperation. It

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also illustrates the educational attainment of the respondents. This study shows that many of the rice farmers are literate, with varying levels of education. It indicates that 62.92% of the respondents are elementary graduates, 19.10% high school graduates, 8.99% high school undergraduates, 3.37% college graduates and college undergraduates and 2.25% vocational course. It means that government programs like farmer field school on rice farmers was for all, it's either one finished studying or not. According to Van den Berg & Knos (2007) also point out that farmers, irrespective of their level of formal education, can benefit from education through initiatives like FFS by adopting sustainable practices and making better decisions. The results of this study indicates that FFS may be especially helpful in closing the knowledge gap and increasing farm output for people with lower educational attainment, especially while the majority of respondents have at least attended elementary school.

Table 1 also shows that most of the rice farmers in the study are Roman Catholic, making up 97.75% of the total, while only 2.25% belong to Iglesia ni Cristo. This means that the majority of farmers in the Municipality of Pres. Manuel A. Roxas, Zamboanga del Norte, share the same religious affiliation. Having a common religion may help build stronger community ties, which can be helpful when organizing group activities like the Farmer Field School. It may also affect how farmers interact with one another, share knowledge, and support each other in learning and applying new farming practices. According to Prasad et al. (2017), farmers adoption of new technology and practices can be affected by social and cultural factors such as religious affiliation. It also shows the profile of the respondents in terms of family size. The data shows that most of the rice farmers in the study have medium-sized families, with 51.69% having 4 to 6 family members. About 46.05% have smaller families with 1 to 3 members, while only 2.25% have large families with 8 to 10 members. This means that many farmers live in households with several family members who may help with farming work. Family size can affect the farmers' daily activities, sources of income, and how they benefit from programs like the Farmer Field School, since more family members may help in the field or share the knowledge learned from the training. According to Agarwal (2015), family size affects farming labor and food security. Families with more members may have more help on the farm but also face higher household expenses. In FFS program, as noted by Davis et al. (2012), understanding family size is important because it affects how much farmers can invest in learning and applying new techniques at home and in the field. The table also illustrates the profile of the respondents in terms of the number of years in rice production. The data shows that most of the rice farmers in the study have been involved in farming for a long time, with 82.02% having 11 to 15 years of experience. A smaller number, 13.48%, have been farming for 6 to 10 years, and only 4.49% have 1 to 5 years of experience. This means that most farmers in the Municipality of Pres. Manuel A. Roxas, Zamboanga del Norte, are experienced and have been working in rice farming for many years. Their long experience may help them understand farming better, and it can also affect how they respond to programs like the Farmer Field School, since they may already have knowledge and skills that they can improve through training. According to Kumar & Singh (2013), farmers with more years of experience are frequently more willing to try out new agricultural methods, although they might require more specialized assistance when switching from conventional practices.

It also illustrates the percentage distribution of the main source of income among the respondents. The data shows that almost all of the rice farmers in the study rely on farming as their main source of income, with 96.63% depending on it. Only a few have other sources of income, such as carpentry, driving or fishing (1.12%). This means that most farmers earn their living mainly through farming. Because farming is their main livelihood, programs like the Farmer Field School are very important for them, as these can help improve their skills, increase their harvest, and raise their income. This agrees with Davis et al. (2012), who said that rice farmers who joined FFS often depended on farming as their main job and saw improvements in how they farmed. It shows the profile of the respondents in terms of other source of income before program implemented. The data shows that most of the rice farmers in the study also consider farming as their other source of income, with 96.63% still listing it even when asked about other sources. Only a few farmers earn extra income from other jobs, such as vending (2.25%) or carpentry (1.12%). This means that farming is not only their main work but also their extra source of income. It shows how important farming is in their daily lives, and it also shows that many of them may have limited income sources. Similar findings were noted by Pretty et al. (2003), who emphasized that in rural areas, farming remains the key income source, and programs like FFS can help improve farm productivity. The table shows the distribution of respondents in terms of monthly income. The majority of the respondents (88.76%), stated that the monthly income ranges from 5,000

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and below. Few of the respondents (10.11%) expressed their income ranges from 6,000 to 10,000 and just (1.12%) of the respondents expressed also their income ranges from 11,000 to 15,000. This indicates that the majority of the respondents who participated to farmer field school in the municipality of Pres. Manuel A. Roxas, Zamboanga del Norte has an average income of 5,000 and below. Singh et al. (2017) found that farmers income levels were low before FFS, but improved after adopting better techniques taught through the program. And also it shows the distribution of respondents in terms of house ownership. The data shows that most of the rice farmers in the study own their houses, with 95.51% having houses they personally own, while 4.49% live in houses they inherited. This means that almost all of the farmers in the Municipality of Pres. Manuel A. Roxas, Zamboanga del Norte, have a stable place to live. Having their own homes may help lessen their expenses and give them more security in life. It also shows that many of them have been living in the area for a long time. According to Hossain et al. (2018) also mentioned that increased income through FFS helps farmers build better homes, which improves their quality of life and gives them a sense of security and pride. House ownership is not only important for comfort, but it also reflects a stronger connection to the land and community.

These also illustrates the profile of the respondents in terms of type of house. The data shows that most of the rice farmers in the study live in houses made of mixed materials, with 44.94% having homes built from a combination of cement, wood, or bamboo. About 31.46% live in houses made of wood, 16.85% in houses made of cement, and only 6.74% in bamboo houses. This suggests that while many farmers do not live in fully concrete homes, they are making efforts to build stronger, safer houses using available materials. It reflects the gradual improvement in their living conditions. This is supported by Davis et al. (2012), who said that FFS not only improves farming knowledge but also helps farmers make better life choices, like upgrading their houses. Having a homemade of mixed or stronger materials gives families more protection and comfort, especially during harsh weather, which is important for rural communities. Table 1 shows the profile of the respondents in terms of ethnic origin. Data presents that most of the rice farmers in the study are Cebuanos, making up 56.18% of the total, followed closely by Subanen at 39.33%. Only a small number, 4.49%, are Ilonggo. This means that the farming community in the Municipality of Pres. Manuel A. Roxas, Zamboanga del Norte, is mostly made up of Subanen and Cebuano ethnic groups. Knowing the farmers' ethnic backgrounds is important because it can help in understanding their culture, language, and way of life, which may affect how they learn and apply new knowledge from programs like the Farmer Field School. This can also help in planning better training that fits their needs and respects their traditions.

The presence of indigenous people like the Subanen highlights the importance of culturally sensitive approaches in agricultural programs. According to Pretty et al. (2003), strong community ties and cultural identity can improve how farmers work together and share knowledge, which helps in adopting sustainable farming practices. FFS programs that respect and include different ethnic backgrounds are more effective because they build trust and encourage participation. These diverse communities also bring different farming experiences and traditions, which can enrich group learning in FFS sessions and strengthen social support among farmers.

In terms of number of years in rice farming, the data shows that most of the rice farmers in the study have been farming for a very long time, with 28.09% having 11 to 15 years of experience. Others have also been in farming for many years, with 24.72% having 40 years and more, 17.98% with 5 to 10 years, 15.73% with 20 to 25 years, and only 13.48% having 30 to 35 years of experience. This means that many farmers have been working in rice farming for most of their lives. Their long years of experience show that they are very familiar with farming, but they may also be used to traditional ways. The Farmer Field School can help these farmers by introducing new and better farming methods that can improve their harvest and income while building on the knowledge they already have. According to Kumar and Singh (2013), FFS is especially effective among experienced farmers because they can easily apply and test what they learn in their own fields. And it also represents the profile of the respondents in terms of number of hectares in rice farm. The data shows that most of the rice farmers in the study are farming on small land areas. The largest group, 49.44%, are working on 1/4 hectare of land, followed by 38.20% with 1/2 hectare, 8.99% with 1 hectare, and only 3.37% with 3/4 hectare. This means that many farmers in the Municipality of Pres. Manuel A. Roxas, Zamboanga del Norte, have limited land for rice farming. Because of this, it may be harder for them to produce large harvests or earn more

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income. The Farmer Field School can be very helpful in teaching these farmers how to use their small land more effectively, so they can grow more rice and improve their livelihood. This is similar to what was found by Nkonya et al. (2011), who said that small land sizes are typical among farmers in developing countries and FFS can help make small-scale farming more productive.

Lastly, it also shows the profile of the respondents in terms of farmer classification. The data shows that majority of the rice farmers in the study are tenants, with 74.16% farming on land they do not own, while only 25.84% are landowners. This means that in the Municipality of Pres. Manuel A. Roxas, Zamboanga del Norte, many farmers depend on land owned by others to grow rice. Being a tenant can make farming more difficult because they may have to pay rent or share their harvest with the landowner. It can also limit their decisions on how to improve the land. Because of this, programs like the Farmer Field School can help tenants learn better farming methods to improve their harvest, even if they do not own the land. According to Agarwal (2015), land ownership is a major issue for many farmers, especially women, and addressing this through policies or training support is key to improving their long-term income and food security.

Table 1. The Profile of the Respondents

Description	Frequency	Percentage
Age		
21-30	5	5.62
31-40	12	13.48
41-50	11	12.36
51-60	21	23.59
61-70	27	30.34
71 and above	13	14.61
Total	**89**	**100.00**
Sex		
Male	34	38.20
Female	55	61.79
Total	**89**	**100.00**
Civil Status		
Single	8	8.99
Married	66	74.16
Separated	2	2.25
Widowed	13	14.61
Total	**89**	**100.00**
Educational Attainment		
Elementary Graduate	56	62.92
High School Undergraduate	8	8.99
High School Graduate	17	19.10
College Undergraduate	3	3.37
College Graduate	3	3.37
Vocational Course	2	2.25
Total	**89**	**100.00**
Religious Affiliation		
Roman Catholic	87	97.75
Iglesia Ni Cristo	2	2.25
Total	**89**	**100.00**

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Family Size		
1 to 3	41	46.05
4 to 6	46	51.69
8 to 10	2	2.25
Total	**89**	**100.00**
Number of Years in Rice Production		
1 to 5	4	4.49
6 to 10	12	13.48
11 to 15	73	82.02
Total	**89**	**100.00**
Main Source of Income		
Farming	86	96.63
Carpenter	1	1.12
Driving	1	1.12
Fishing	1	1.12
Total	**89**	**100.00**
Other Source of Income Before Program Implemented		
Farming	86	96.63
Vendor	2	2.25
Carpenter	1	1.12
Total	**89**	**100.00**
Monthly Income		
5,000 below	79	88.76
6,000 to 10,000	9	10.11
11,000 to 15,000	1	1.12
Total	**89**	**100.00**
House Ownership		
Owned	85	95.51
Inherited	4	4.49
Total	**89**	**100.00**
Type of House		
Cement	15	16.85
Wood	28	31.46
Bamboo	6	6.74
Mixed	40	44.94
Total	**89**	**100.00**
Ethnic Origin		
Ilonggo	4	4.49
Cebuano	50	56.18
Subanen	35	39.33
Total	**89**	**100.00**

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Number of Years in Rice Farming		
5 to 10	16	17.98
11 to 15	25	28.09
20 to 25	14	15.73
30 to 35	12	13.48
40 and above	22	24.72
Total	**89**	**100.00**
Number of Hectares in Rice Farm		
¼	44	49.44
½	34	38.20
¾	3	3.37
1	8	8.99
Total	**89**	**100.00**
Farmer Classification		
Landowner	23	25.84
Tenant	66	74.16
Total	**89**	**100.00**

Table 2. Level of Effectiveness of FFS Technology

Technology	**AWV**	**Interpretation**
Seed Selection	4.30	Very Large Effect
Land Preparation	4.45	Very Large Effect
Practice Synchronous Planting	4.31	Very Large Effect
Grow Healthy Seedlings	4.57	Very Large Effect
Nutrient Management	4.55	Very Large Effect
Water Management	4.19	Large Effect
Pest Management	4.55	Very Large Effect
Harvest Management	4.52	Very Large Effect
Post-Harvest Management	4.45	Very Large Effect
Mean	**4.43**	**Very Large Effect**

Table 2 shows that the Farmer Field School (FFS) had a very strong effect on improving the farming practices of rice farmers. Farmers rated the training on different farming methods such as seed selection, land preparation, pest control, and nutrient management. Most of these areas were rated as having a very large effect, which means that farmers found the FFS training very helpful. The most helpful practices were growing healthy seedlings, managing nutrients, and pest management. Even water management, which had the lowest score among the group, still received a "large effect" rating. This means that FFS was successful in helping farmers learn better ways to grow rice and manage their farms more efficiently. These results agree with the findings of Davis et al. (2012), who said that FFS helps farmers improve their knowledge and farm practices through hands-on learning.

Table 3. Social and Economic Effects

Social Effects

Social Effects	AWV	Interpretation
Able to provide the family needs like clothing and etc.	4.48	Very Large Effect
Able to provide the basic sanitary needs	4.31	Very Large Effect

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Able to provide the families health needs	4.39	Very Large Effect
Able to provide the children nutritional needs	4.39	Very Large Effect
Able to send children to school	4.66	Very Large Effect
Able to provide the wants of the children	4.19	Large Effect
Mean	**4.40**	**Very Large Effect**

Economic Effects

Economic Effects	AWV	Interpretation
Able to provide decent home	4.16	Large Effect
Able to provide decent meals for the family at least 3 times a day	4.67	Very Large Effect
Able to provide decent clothing for the family	3.96	Large Effect
Able to lift up the family from impoverish situation	4.22	Very Large Effect
Able to construct health and sanitation facilities	3.66	Large Effect
Mean	**4.13**	**Large Effect**

Table 3 shows that the Farmer Field School (FFS) program had a strong positive effect on both the social and economic lives of rice farmers. On the social side, farmers said that FFS helped them take better care of their families. They were more able to meet basic needs such as food, clothing, hygiene, health care, and sending their children to school. The highest rating was for being able to send their children to school, which means that the program gave families the chance to improve their children's future. On the economic side, the farmers said they could now afford better meals, build or improve their homes, and slowly rise out of poverty. While some areas, like building sanitation facilities and buying clothes, were rated slightly lower, the overall effect was still large. This shows that FFS not only helped farmers in the field but also made life better at home. These results agree with the findings of Pretty et al. (2003) and Van den Berg & Jiggins (2007), who noted that FFS improves farmers' lives by teaching better farming methods and building stronger communities. The improvements in social needs like education and health reflect what Hossain et al. (2018) also observed in their study, where farmers had more stable incomes and could provide better for their families.

Table 4. T-test test of significant difference on the income of the rice farmers before and during the implementation of farmer field school

Mean Difference		**P-Value**	**Decision**	**Interpretation**
Income Before	₱ 4,797.753	0.000	Reject H_o Hypothesis	Significant Difference
And				
During	₱ 8,370.143			

Table 4 shows the t-test results indicate a statistically significant difference in income before and during the implementation of the intervention, with a mean difference of ₱4,797.75 and a *p*-value of 0.000. Since the *p*-value is less than 0.05, the null hypothesis is rejected, confirming that the implementation had a meaningful impact on income levels. The increase in income from ₱4,797.75 to ₱8,370.14 demonstrates a substantial improvement in financial outcomes during the intervention period. This result suggests that the program or policy introduced during the implementation phase was effective in boosting income. According to Creswell and Creswell (2018), a significant difference in a paired t-test supports the idea that a change or treatment has had an effect on the measured outcome. In this case, the data clearly supports the effectiveness of the intervention in improving economic conditions for the participants. This aligns with prior studies that highlight the positive impact of targeted programs or support mechanisms on income generation, especially in community-based or developmental initiatives (Patton, 2015; McDavid, Huse, & Hawthorn, 2019).

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Table 5 Somer's D of significant relationship between the technology transfer by FFS and the level of socio-economic effect

Somers' D Value		P-Value	Decision	Interpretation
Between Farmer Field School Technology and Socio-Economic Status	0.257	0.003	Reject H_o Hypothesis	Significant Relationship

Table 5 presents the Somers' D test result shows a positive and statistically significant relationship between Farmer Field School (FFS) technology and socio-economic status, with a Somers' D value of 0.257 and a *p*-value of 0.003. Since the *p*-value is less than 0.05, the null hypothesis is rejected, indicating that there is a significant association between participation in FFS technology and improvements in socio-economic status. The positive Somers' D value suggests that as participation or engagement with FFS technology increases, so does the socio-economic status of the participants. This aligns with findings from previous research showing that agricultural extension programs like FFS can significantly enhance farmers' knowledge, productivity, and ultimately their income and living standards (Davis et al., 2012). FFS programs are designed to be participatory and knowledge-intensive, enabling farmers to make better-informed decisions, adopt sustainable practices, and improve their economic outcomes (Van den Berg & Jiggins, 2007). Therefore, this result confirms the effectiveness of FFS technology in contributing to the socio-economic advancement of farmers. It highlights the importance of continuous support and investment in agricultural training and extension services to uplift rural communities economically and socially.

CONCLUSIONS

The study concludes that the Farmer Field School (FFS) program plays a vital role in improving the lives of rice farmers, the majority of whom are older, female, married, and have modest educational backgrounds. Through experiential learning, the FFS program effectively facilitated the transfer of practical agricultural technologies that enhanced farmers' knowledge and skills in seedling management, nutrient management, pest control, and post-harvest practices. This hands-on learning approach not only strengthened their confidence and improved farm productivity but also significantly increased their household income, enabling them to better support their families and improve their overall living conditions. Furthermore, the study established a strong positive relationship between the extent of FFS technology transfer and the farmers' socioeconomic improvement, indicating that greater access to agricultural knowledge, appropriate technologies, and sustainable farming practices contributes directly to enhanced livelihoods and community empowerment. Anchored in Experiential Learning Theory and Social Capital Theory, the success of the FFS program demonstrates that learning through practical experience, combined with collaboration, social interaction, and knowledge sharing, strengthens farmers' individual capabilities and promotes the long-term resilience of farming communities.

RECOMMENDATIONS

It is recommended that the Farmer Field School (FFS) program broaden its reach by actively encouraging the participation of younger individuals and more male farmers to promote the intergenerational transfer of agricultural knowledge, skills, and innovations. Local government units, the Department of Agriculture, and other concerned agricultural agencies should strengthen, institutionalize, and replicate the program in barangays and municipalities with comparable farming conditions, considering its demonstrated positive effects on farmers' social and economic well-being. To sustain these benefits, FFS graduates should be encouraged to establish farmer groups, associations, or cooperatives that promote teamwork, knowledge exchange, resource sharing, and collaborative problem-solving. Continuing education should likewise be provided through regular follow-up training on modern farming technologies, sustainable agricultural practices, farm enterprise management, and climate change adaptation. Furthermore, the Department of Agriculture and its partner institutions should conduct systematic monitoring and periodic impact assessments to determine the program's long-term effects on household income, technology adoption, farming practices, productivity, food security, and quality of life. Finally, climate resilience and environmental education should be fully integrated into the FFS curriculum to equip farmers with practical and sustainable strategies for conserving natural

resources, addressing environmental risks, strengthening food security, and building more resilient farming communities.

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APPENDIX

I. Personal Information Profile

1. Name: _____
2. Age: _____
3. Address: _____
4. Sex:

( ) Male

( ) Female

5. Civil Status:

( ) Single

( ) Married

( ) Separated

( ) Widowed

6. Educational Attainment:

( ) Elem. Graduate

( ) HS Undergraduate

( ) HS Graduate

( ) College Undergrad

( ) College Graduate

( ) Vocational Course

7. Religious Affiliation:

( ) Roman Catholic

( ) Iglesia ni Cristo

8. Family Size

( ) 1-3

( ) 4-6

( ) 8-10

( ) Above 10

9. No. of years in rice production

( ) 1-5 years

( ) 6-10 years

( ) 11-15 years

10. Main Source of Income:

( ) Farming

( ) Vendor

( ) Carpenter

( ) Driving

( ) Laborer

( ) Fishing

( ) Government Employee

( ) Others (Specify)_____

11. Other source of income before Program implemented:

( ) Farming

( ) Vendor

( ) Carpenter

14. Type of House:

( ) Cement

( ) Wood

( ) Bamboo

( )Mixed

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12. Monthly Income:

( ) 5,000 below

( ) 6,000-10,000

( ) 11,0000- 15,000

( ) 16,000- 20,000

( ) 21,000 above

13. House ownership

( ) Owned

( ) Inherited

( ) Rented

15. Ethnic Origin:

( ) Ilonggo

( ) Cebuano

( ) Subanen

16. Number of years in rice farming: _____

17. Number of hectares of rice farm: _____

18. Farmer Classification:

( ) Landowner

( ) Tenant

( ) Others (Specify) _____

II. What is the level of effectiveness of the FFS technology in terms of:

Encircle the rate base on the following:

5 – Very large effect 4 – Large effect

3 – Neutral 2 – Less effect

1 – No effect

Technology	**Rating**				
Seed Selection	5	4	3	2	1
Land Preparation	5	4	3	2	1
Practice Synchronous Planting	5	4	3	2	1
Grow Healthy Seedlings	5	4	3	2	1
Nutrient Management	5	4	3	2	1
Water Management	5	4	3	2	1
Pest Management	5	4	3	2	1
Harvest Management	5	4	3	2	1
Post- Harvest Management	5	4	3	2	1

III. Perceived Socio-economic effects of Farmer Field School (FFS). Encircle the rate base on the following:

5 – Very large effect 4 – Large effect

3 – Neutral 2 – Less effect

1 – No effect

Income Effect	**Rating**				
Before the program implementation	5	4	3	2	1
After the program implementation	5	4	3	2	1

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1. Estimated Monthly Income: Php _____(Before)

Php _____ (After)

Social Effect	**Rating**				
Able to provide the family needs like clothing and etc.	5	4	3	2	1
Able to provide the basic sanitary needs	5	4	3	2	1
Able to provide the families health needs	5	4	3	2	1
Able to provide the children nutritional needs	5	4	3	2	1
Able to send children to school	5	4	3	2	1
Able to provide the wants of the children	5	4	3	2	1
Economic Effect	**Rating**				
Able to provide decent home	5	4	3	2	1
Able to provide decent meals for the family at least 3 times a day	5	4	3	2	1
Able to provide decent clothing for the family	5	4	3	2	1
Able to lift up the family from impoverish situation	5	4	3	2	1
Able to construct health and sanitation facilities	5	4	3	2	1
Able to meet the daily financial needs of the family	5	4	3	2	1