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From Traditional to Modern: Understanding the Impact of Agricultural Changes on Farmers

Naomi Deshiree S. Notorio[1]; Katherine Q. Agnes[2]; Lance Vincent A. Dela Torre[3]; Romarc B. Coronel[4]

[1;2;3;4]Julia Ortiz Luis National High School

Republic of the Philippines

Department of Education

Region III – Central Luzon

Schools Division Office of Nueva Ecija

Brgy. Sagaba, STO. Domingo, Nueva Ecija

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ABSTRACT

This study aimed to explore the effects of agricultural modernization on local farmers, especially how it changed their ways of caring for their fields and their experience in using agricultural machinery. It also looked into the relationship between their socio-demographic profile—such as age, income, years in farming, and farm size—and their adoption of modern farming practices. The study used a quantitative method and gathered data through a survey with self-administered questionnaires given to selected farmers. The results showed that modernization has generally made farm work easier and more efficient for many farmers. Most respondents agreed that using modern tools improved their productivity, confidence, and crop quality. However, some still experienced challenges in adjusting to new technologies. The findings also showed that farmers with higher income and more experience were more likely to adopt modern methods. Despite the benefits, not all farmers saw big improvements in profit or market competitiveness. The study concludes that modernization has a positive impact, but there is still a need for support like training, affordable machinery, and guidance to help farmers fully benefit from modern farming. It is recommended that the government, LGUs, and other agencies continue supporting farmers by improving access to technology and providing hands-on assistance.

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CHAPTER ONE
INTRODUCTION

➢ *The Problem and its Background*

Agriculture has long been the backbone of the Philippine economy, providing food and livelihood for millions, particularly in rural areas. However, the rapid modernization of the sector has created a growing divide between large-scale farm owners and small-scale farmers who struggle to keep up with technological advancements. While mechanization has improved productivity, it has also threatened the livelihoods of those who lack the financial capacity to invest in modern equipment. The very farmers who work tirelessly to feed the nation are often the ones left behind, forced to rely on outdated methods that can no longer compete with large-scale, mechanized agriculture. This imbalance raises critical questions about the future of Philippine farming and whether progress is truly inclusive.

The benefits of mechanization are undeniable. BusinessKiwi (2018) highlights that modern farming equipment increases efficiency in planting, harvesting, and irrigation, allowing for higher yields with reduced labor. However, these advancements come at a cost. Paredes (2023) argues that the shift toward large-scale, technology-driven farming threatens traditional agricultural practices that emphasize sustainability and environmental balance. Furthermore, Sicat (2018) points out that the high cost of machinery prevents small farmers from competing with wealthier landowners, widening the gap between rich and poor in the agricultural sector. Carpio (2019) also warns that automation has displaced many farm laborers, increasing rural unemployment and deepening poverty in already struggling communities.

This situation demands urgent action. If modernization continues without inclusive policies, small farmers will be pushed further into economic hardship, and the nation's food security could become increasingly dependent on large agribusinesses. This study seeks to explore the true impact of mechanization on small-scale farmers, shedding light on both its benefits and challenges. More importantly, it aims to advocate for solutions—such as financial assistance, training programs, and policy interventions—that can ensure that technological progress benefits all farmers, not just those with the means to afford it. Agriculture should not be an industry where only the wealthy thrive; it should be a foundation for sustainable growth and food security for everyone. The future of Philippine agriculture depends on making modernization accessible, equitable, and truly beneficial for all.

The main objective of this study is to examine the impacts of agricultural modernization on small-scale farmers in order to identify both its advantages and disadvantages, and to recommend solutions that will make modernization more accessible, equitable, and beneficial for all.

➢ *Statement of the Problem*

This study aims to analyze the adoption of modernization in agriculture among local farmers through the lens of Everett Rogers' Diffusion of Innovations Theory. Specifically, it seeks to answer the following questions:

- *How may the Profile of the Respondents be Described in Terms of:*

✓ Age;
✓ Years in Farming;
✓ Farm Size; and
✓ Income?

- *What are the Changes that Occurred in Farmers' Approaches to Caring for Agricultural Fields due to Modernization?*
- *What are the Effects of Using Agricultural Machinery in Terms of:*

✓ Advantages; and
✓ Disadvantages?

- *How do Farmers Perceive the Benefits of Modern Farming Practices in Improving Productivity and Income?*
- *How Compatible are Modern Farming Methods with the Traditional Practices of Local Farmers?*

Is there a significant relationship between the farmers' socio-demographic profile and the changes that occurred in their approaches to caring for agricultural fields due to modernization?

➢ *Hypotheses*

- Null Hypothesis (H_0): There is no significant relationship between the farmers' socio-demographic characteristics and the changes in their approaches to caring for agricultural fields due to modernization.

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- Alternative Hypothesis (H_1): There is a significant relationship between the farmers' socio-demographic characteristics and the changes in their approaches to caring for agricultural fields due to modernization.

➢ *Research Paradigm*

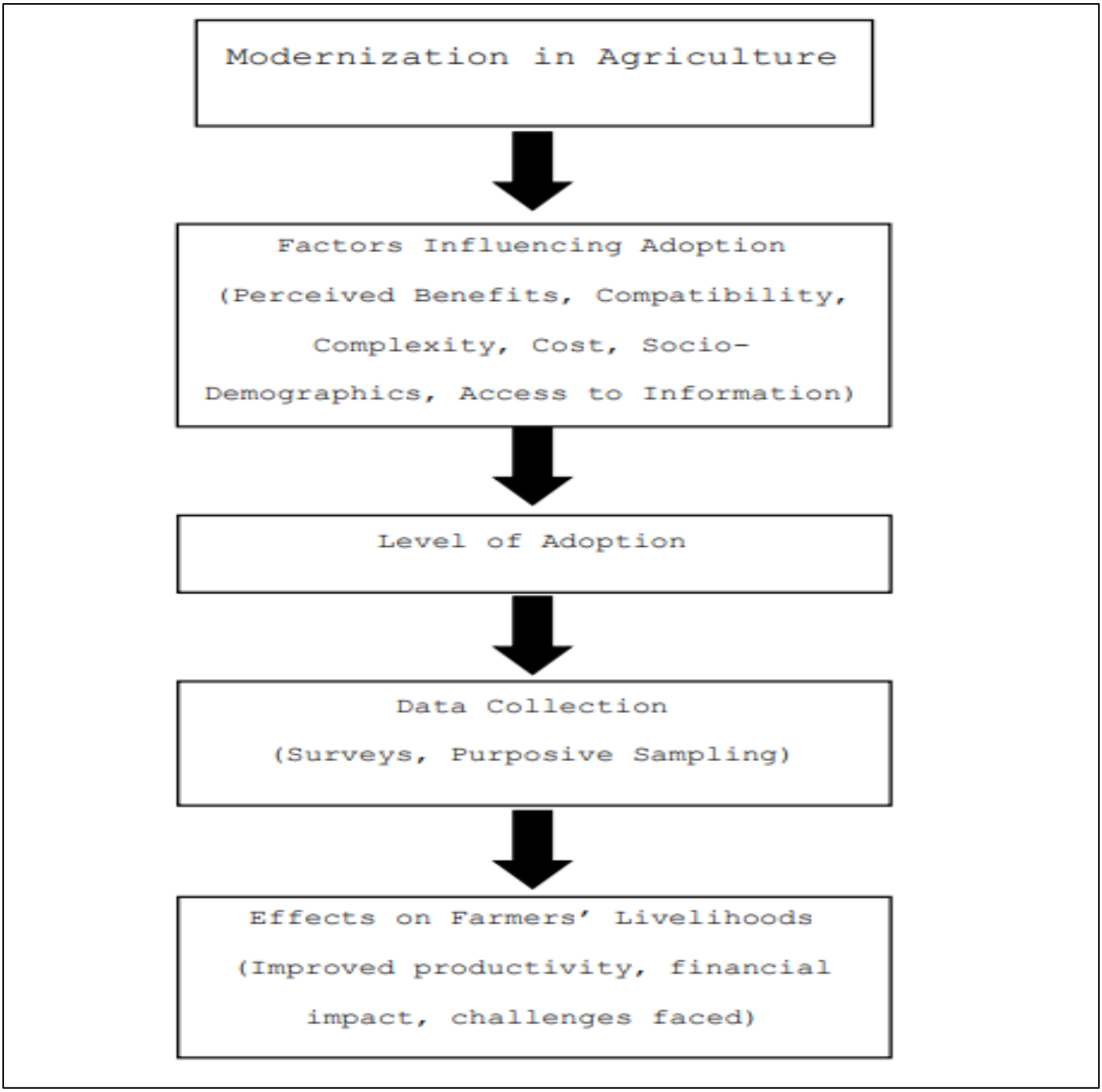

Fig 1 Research Paradigm

➢ *Conceptual Framework*

This study's conceptual framework is based on Everett Rogers' Diffusion of Innovations Theory, which explains how new technologies spread and the factors influencing their adoption. It explores the relationship between modernization in agriculture, adoption factors, adoption level, and its effects on farmers' livelihoods.

Modernization introduces new farming technologies, machinery, and techniques, but adoption varies due to factors like perceived benefits, compatibility, complexity, cost, socio-demographics, and access to information. Farmers either adopt or resist modernization, impacting their productivity, efficiency, and financial stability. Understanding these factors helps identify barriers and improve the adoption of modern agricultural practices.

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➢ *Theoretical Framework*

This study is guided by the Diffusion of Innovations Theory by Everett M. Rogers (1962). This theory explains how new technologies, ideas, or practices spread within a community or social system over time. Rogers identifies key factors that influence the adoption of innovations, including perceived benefits, compatibility with existing practices, complexity, and serviceability.

In the context of agricultural modernization, the theory helps analyze how and why local farmers adopt modern farming methods, as well as the barriers that may slow down or prevent adoption. Farmers are more likely to embrace new agricultural technologies if they perceive them as beneficial, easy to use, and compatible with their existing farming practices. However, if the new methods are too complex, expensive, or require significant changes in their traditional ways of farming, adoption may be slower. Additionally, social influences, access to information, and support from agricultural institutions play crucial roles in the diffusion process.

By applying Rogers' theory, this study aims to understand the relationship between farmers' socio-demographic profiles and the factors influencing their adoption of modernization efforts. It also seeks to identify the challenges that hinder the successful implementation of modern farming technologies and practices within local communities.

➢ *Scope and Delimitation*

This study focuses on the impact of agricultural modernization on small-scale farmers with landholdings of 1 to 2 hectares in five selected barangays of Santo Domingo, Nueva Ecija, namely: Barangay San Fabian, Cabugao, Malaya, Dolores, and San Pascual. These barangays were specifically chosen due to the high concentration of small-scale farmers in these areas. Through random sampling, 50 participants will share their perspectives via surveys questionnaires. The study does not cover large-scale farms or technical details of machinery, prioritizing a localized understanding of how modernization influences the livelihoods and practices of small farmers.

➢ *Significance of the Study*

This study examines the impacts of agricultural modernization, providing critical insights for farmers, researchers, respondents, and organizations. Its findings aim to advance sustainable practices, enhance livelihoods, and foster equitable development across sectors.

- Local Farmers. The study will help local farmers understand the impacts of agricultural modernization on their livelihoods and provide strategies to adapt and improve productivity.
- Rural Communities. Rural communities will benefit through enhanced farming practices that boost local economies while preserving traditional knowledge.
- Agribusinesses. Agribusinesses will gain insights into farmers' needs, enabling them to provide better products and services while promoting sustainable practices.
- Local Farmers. This study will benefit by contributing their experiences to the research and gaining solutions tailored to their specific challenges.
- Government Agencies. Policymakers can use the findings to create programs and policies that support equitable and sustainable agricultural modernization.
- Educational Institutions. Schools and universities can integrate the study's findings into their curricula, enriching agricultural education and training programs.
- Non-Governmental. Non-Governmental Organizations (NGOs) working in rural development and sustainability can use the study to design interventions that empower farmers and support community development.
- Future Researchers. This research will serve as a reference for future studies on agricultural development and sustainability, offering valuable data and insights.

➢ *Definition of Terms*

A clear understanding of key agricultural and environmental terms is essential for effectively addressing challenges in food production, resource management, and sustainability. This compilation of definitions presents both conceptual and operational meanings, offering a comprehensive perspective on crucial topics such as agricultural mechanization, food security, and sustainability. By defining these terms, this resource aims to enhance knowledge and promote informed decision-making in the agricultural sector and beyond.

➢ *Agricultural Mechanization*

- Conceptual definition: embraces the use of tools, implements and machines for agricultural land development, crop production, harvesting, and preparation for storage, storage, and on-farm processing. It includes three main power sources: human, animal, and mechanical.
- Operational definition: Is the use of machinery and equipment to perform agricultural tasks, replacing human labor with other energy sources. It can include a range of tools, from basic hand tools to more sophisticated motorized equipment.

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➢ *Climate Change*

- Conceptual definition: This refers to the changes in climate patterns, such as rising temperatures, altered precipitation, and increased frequency of extreme weather events, impacting agricultural productivity, food security, and rural livelihoods (IPCC, 2019).
- Operational definition: This can affect crops, livestock, soil and water resources, rural communities, and agricultural workers, refers to significant changes in global temperature, precipitation, wind patterns and other measures of climate that occur over several decades or longer.

➢ *Cost*

- Conceptual definition: The amount of money spent to produce something or deliver a service, the expenses incurred to produce a specific amount of a product within a specific time period costs can be categorized as cash, non-cash, or imputed
- Operational definition: Are the expenses which are related to the operation of a business, or to the operation of a device, component, and piece of equipment or facility.

➢ *Food Security*

- Conceptual definition: Availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices.
- Operational definition: Refers to physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

➢ *Income*

- Conceptual definition: The monetary value of agricultural production, including sales of crops and livestock, minus expenses (FAO, 2017), the net earnings from farming activities.
- Operational definition: The profits and losses that result from operating a farm or agricultural business, and the value of the goods and services produced and consumed within the household, is a useful measure of well-being.

➢ *Irrigation*

- Conceptual definition: The artificial application of water to crops to meet their water needs when rainfall is insufficient and the supply of water to crops by artificial means.
- Operational definition: Is the process of applying water to soil, primarily to meet the water needs of growing plants. Water from rivers, reservoirs, lakes, or aquifers is pumped or flows by gravity through pipes, canals, ditches or even natural streams.

➢ *Small-Scale Farmers*

- Conceptual definition: Refers to a farming system where small farms dominate, typically less than two hectares in size, and rely heavily on family labor, and they may use family labor to meet production needs.
- Operational definition: Refers to a farming system where small farms dominate, typically less than two hectares in size, and rely heavily on family labor and those who manage a limited amount of land and primarily produce their own food.

➢ *Sustainability*

- Conceptual definition: Is a conceptual framework that involves farming practices and a way of thinking that aims to produce food and livestock while minimizing negative environmental impacts.
- Operational definition: Refers to the ability to maintain or support a process continuously over time, farming and protect the environment, aid and expand natural resources and to make the best use of nonrenewable resources.

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CHAPTER TWO
REVIEW OF RELATED LITERATURE AND STUDIES

➢ *Local Literature*

Agricultural modernization has brought significant changes to farming practices worldwide, offering opportunities for growth while presenting challenges for local farmers. A critical aspect of this transformation is the integration of sustainable practices into agriculture. According to Iqbal et al. (2015), small farmers are particularly interested in machinery designed for small land areas. Such equipment reduces labor costs and increases efficiency, replacing traditional manual tools. However, they noted challenges in creating specialized machinery tailored to individual farm needs and specific cropland conditions.

The Sustainable Agriculture Treaty (2016) emphasized the three fundamental pillars of sustainable agriculture: environmental stewardship, economic profitability, and social equity. These principles guide policies and practices aimed at achieving long-term agricultural stability. Similarly, the United States Department of Agriculture (USDA, 2016) defined sustainable agriculture as a method that maximizes technology and expertise to ensure agricultural stability, consumer safety, and environmental preservation. Building on this foundation, the Sustainable Agriculture Research and Extension (SARE, 2016) program supported education and innovation, encouraging institutions to develop academic programs focused on sustainable farming practices.

Research by Srisumpon et al. (2019) demonstrated a negative correlation between mechanization and labor productivity on farms. Their findings showed that larger, mechanized farms achieved significant labor savings, further proving the efficiency of mechanized farming on extensive plots.

The role of mechanization during crises was highlighted by Rahman et al. (2021), who discovered that mechanical technologies played a crucial role in mitigating the impact of disasters such as pandemics and tropical cyclones. Mechanization sped up agricultural processes, freeing time to support other economic sectors and maintaining the continuous supply of food.

In the Philippines, Briones (2022) argued that agricultural modernization is essential to meet rising food demand and improve rural incomes. However, challenges such as inadequate infrastructure, limited access to advanced technology, and gaps in farmer education remain. Briones stressed the importance of institutional reforms and public-private partnerships to foster innovation and overcome these barriers.

The Philippine Institute for Development Studies (2022) evaluated the Agriculture and Fisheries Modernization Act (AFMA) and reported incremental progress. The study emphasized the need for sustained investments in technology, infrastructure, and human capital while recommending bottom-up planning to address the specific needs of farmers and fishers.

The Department of Agriculture (2023) reaffirmed that modernization is a key strategy for addressing food security amidst challenges such as climate change, population growth, and global trade competition. The agency implemented sustainable farming practices supported by innovative technologies and policy reforms to improve productivity and competitiveness. Similarly, the Development Academy of the Philippines (2023) conducted a nationwide assessment of AFMA, finding incremental progress in productivity and infrastructure. Despite these gains, persistent barriers, including limited funding and policy gaps, continue to hinder full modernization. The study recommended improving institutional support, adopting advanced technologies, and strengthening farmer capacity-building initiatives to accelerate modernization.

➢ *Local Studies*

Agricultural modernization has long been recognized as a crucial factor in improving productivity, sustainability, and economic growth in the agricultural sector. According to Amongo et al. (2015), mechanization technologies are at the heart of this transformation. Regardless of the topography or location of the land, the appropriate use of such technologies can maximize productivity, increase job opportunities, and introduce innovative farming techniques. Mechanization enables the full utilization of agricultural land, contributing to environmentally sound development and ensuring food security. This foundation highlights the importance of adopting advanced technologies to achieve sustainable agricultural practices. Building on this, Calibuso et al. (2016) discussed the implications of mechanization on labor migration. While the introduction of machinery in agriculture provided significant benefits for farmers, it also caused temporary unemployment and poverty for landless laborers. However, the study emphasized that unemployment was often short-lived, as displaced workers could transition to alternative jobs. To address these challenges, Calibuso proposed that government interventions be implemented to mitigate the negative effects of mechanization on employment.

Additionally, Quiley (2016) pointed out that while agriculture is a key driver of income growth in many regions, poverty rates had not shown significant improvement despite various interventions in the sector.

In a broader context, Hasan et al. (2020) emphasized the socioeconomic benefits of mechanized agriculture. These include enhanced food security, poverty reduction, increased export revenue, and job creation through technology maintenance and

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operation. Mechanization also fosters value addition and revenue generation through custom hire services, further contributing to economic growth.

Quante (2016) underscored the critical role of mechanization in combating climate change. As unpredictable weather conditions increasingly threaten agricultural productivity, the adoption of advanced mechanical technologies has become essential in mitigating the adverse impacts of extreme weather. Many developing countries have embraced mechanization as part of their climate change adaptation strategies, supported by government initiatives. The situation in the Philippines presents unique challenges and opportunities for agricultural modernization.

De Los Santos (2021) highlighted the struggles faced by smallholder farmers, including limited access to modern techniques, insufficient government support, and a reliance on traditional practices. These issues restrict their productivity and income growth, underscoring the need for targeted interventions to uplift their livelihoods while Chiong (2020) added that urbanization has exacerbated the decline of rural agricultural activities. The study emphasized the importance of modernizing rural infrastructure, improving education, and providing access to technology to rejuvenate the sector. Recent developments have focused on integrating digital technologies into agriculture.

Sarmiento and Garcia (2022) explored the transformative potential of e-commerce platforms, which allow farmers to access wider markets, secure better pricing, and minimize intermediaries. This digital shift has significantly improved the economic outcomes for farmers in the Philippines. At the same time, Bajo and Dela Cruz (2021) examined the challenges of government modernization initiatives, such as the Agricultural Competitiveness Enhancement Fund. Despite their potential, high implementation costs and difficulties in adopting new technologies have hindered their success.

Lastly, Mendoza et al. (2023) highlighted the importance of integrating climate-resilient farming practices into modernization efforts. Sustainable agricultural technologies are vital to mitigating the effects of climate change and ensuring stable food production. As climate-related challenges continue to grow, these practices will play a pivotal role in securing the future of agriculture.

- *Foreign Studies*

Agricultural modernization has brought profound changes to farming practices globally, with both positive and negative effects on local farmers. A critical aspect of this modernization is the integration of sustainability into agricultural practices. According to the Sustainable Agriculture Treaty. (2016), sustainable agriculture is built on three fundamental pillars: environmental stewardship, economic profitability, and social equity. These pillars form the foundation for policies and practices aimed at achieving long-term agricultural stability.

The United States Department of Agriculture. (2016) defines sustainable agriculture as a method that maximizes technology and expertise to ensure long-term agricultural stability while prioritizing consumer safety and environmental preservation. This approach seeks to balance productivity with responsibility, ensuring that farming practices remain viable for future generations. In alignment with these principles, the Sustainable Agriculture Research and Extension. (2016) program emphasizes the importance of sustainable agriculture policies. Established many years ago, SARE has worked to develop comprehensive strategies for sustainable farming. This has included the creation of academic programs by numerous institutions across the United States, focusing on education and research to promote sustainable agricultural practices. Through these efforts, agricultural modernization continues to evolve, addressing the challenges of environmental sustainability while improving farming systems.

Olaganathan et al. (2017) first addressed the environmental consequences of modernization, noting that while technological advancements have improved quality of life, they have also led to issues such as deforestation, pollution, and soil erosion. However, the study also highlighted efforts to mitigate these effects, such as reforestation and the promotion of renewable energy, emphasizing the need for sustainable practices in agriculture.

Building on this, Diao et al. (2018) examined the role of mechanization and infrastructure development in Africa. Their research showed that improvements in irrigation and transportation systems have significantly increased productivity and contributed to rural poverty reduction, highlighting the importance of infrastructure in supporting agricultural growth.

Following this, Kansanga et al. (2019) focused on smallholder farmers in Ghana and observed that while modernization led to larger farms and economic benefits through market-driven crops like maize and rice, it also resulted in the loss of traditional food practices and posed challenges related to climate change.

The World Bank (2019) further explored the global impacts of agricultural modernization, noting that technological advancements and policy reforms have played a vital role in reducing food insecurity and improving food production in developing nations. This study aligns with the findings of OECD (2020), which emphasized the economic benefits of integrating technology, innovation, and rural infrastructure in agriculture. The OECD's research showed how these efforts have enhanced market competitiveness and created new opportunities for farmers, further driving economic growth.

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In China, Zhang et al. (2022) examined the effects of mechanization in Hubei Province, finding that it increased farming efficiency, income, and crop production. However, the high cost of machinery created a divide between farmers who could afford it and those who could not, leading to increased financial inequality. Li et al. (2023) expanded on this by looking at the health impacts of farm mechanization, finding that while it reduced physical labor and improved well-being, it also resulted in fewer job opportunities in rural areas, exacerbating social disparities.

- *Foreign Literature*

Agricultural modernization has evolved over the years, with increasing attention on sustainable practices and the integration of technology to meet the growing global demand for food. The United Nations (2015) emphasized that agricultural sustainability should not exclude technological advancements if they increase productivity without significantly harming other sustainability goals.

This foundation was further reinforced by Iqbal et al. (2015), who observed that small farmers were particularly interested in machinery designed for small land areas to reduce labor costs and improve efficiency, though challenges remained in adapting machinery to specific farming conditions. The following year, the European Union (2016) highlighted the importance of adaptive learning processes and evaluating progress along sustainability trajectories as essential components of managing agricultural systems effectively.

In 2016, the Sustainable Agriculture Treaty (2016) emphasized the three key pillars of sustainable agriculture: environmental stewardship, economic profitability, and social equity. These principles aimed to guide policies and practices for achieving longterm agricultural stability. The Food and Agriculture Organization (FAO, 2017) further contributed to this dialogue by acknowledging the challenges of resource depletion, climate change, and socio-economic inequalities, which threaten global food security. It called for inclusive and sustainable practices to address these challenges and ensure future food security.

In the same year, the Organization for Economic Co-operation and Development (OECD, 2017) reviewed the Philippine government's Agriculture and Fisheries Modernization Plan, highlighting policy measures such as investments in irrigation and access to credit for farmers to promote sustainable agricultural growth.

As agricultural modernization progressed, Organization for Economic Co-operation and Development (OECD, 2018) Emphasized the need for agricultural modernization in the Philippines to foster agricultural growth and alleviate poverty, while noting significant barriers such as poor infrastructure and limited access to advanced technology. International Food Policy Research Institute (IFPRI, 2019) emphasized the importance of strengthening agricultural research, development, and extension systems, particularly in developing countries, to increase productivity and promote sustainable farming. It noted that while progress had been made, challenges such as funding shortages and weak institutional capacities remained barriers to achieving greater agricultural innovation.

By the end of the decade, the growing need for mechanization in agricultural practices was recognized, as it plays a significant role in improving productivity and efficiency. This was underscored by Srisumpon et al. (2019), who demonstrated that mechanized farms showed significant labor savings, especially on larger plots. Together, these studies and reports highlight the disconnectedness of policy, technology, and sustainability in modernizing agriculture, emphasizing the importance of strategic interventions at various levels to address the challenges and opportunities within the sector. Department of Agriculture (2023) Reaffirmed that agricultural modernization is a key strategy for addressing food security challenges, promoting sustainability, and improving agricultural productivity.

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CHAPTER THREE
RESEARCH METHODOLOGY

➢ *Research Locale*

Fig 2 Photo Location Santo Domingo Nueva Ecija

This study was conducted in Santo Domingo, Nueva Ecija, a rural municipality in Central Luzon known for its agricultural significance. As part of the "Rice Granary of the Philippines," Santo Domingo is a major producer of rice, corn, onions, and vegetables. Its fertile soil and irrigation systems support year-round farming, but many smallscale farmers struggle with the high costs of mechanization. With both traditional and modern farming methods present, Santo Domingo is an ideal location to examine the impact of agricultural mechanization on local farmers.

➢ *Research Design*

The researchers employed a descriptive research design in this study to explore the impacts of agricultural modernization on local farmers. This approach allowed the researchers to gather reliable and objective data for directly assessing the effects of modernization. By using a descriptive design, the study aimed to minimize bias and prejudice in the findings. Additionally, quantitative research methods was used to measure the extent of these impacts. (MCleod,2023) Highlights that Quantitative research involves the objective collection and analysis of numerical data to describe, predict, or control variables of interest.

The primary goals of this approach was to test causal relationships between variables, make predictions, and generalize results to a broader population. By integrating quantitative analysis, this study ensures a systematic and data-driven examination of agricultural modernization and its effects on local farmers.

➢ *Research Respondents*

The participants in this study were local farmers and landowners in Santo Domingo, Nueva Ecija, selected using purposive sampling. A total of 50 respondents were chosen based on their experience in agriculture and exposure to mechanized farming. Each participant received a printed survey containing a structured questionnaire to assess the effects of modernization on their agricultural practices. Their responses were crucial in understanding the impact of mechanization on small-scale farmers.

To provide a clearer distribution of the respondents, the table below categorizes them based on farm size and level of mechanization:

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Table 1 Distribution of Respondents by Farm Size and Mechanization Level

CATEGORY	NUMBER OF RESPONDENTS (n=50)	PERCENTAGE (%)
Small-scale farmers (1-3 ha) – Traditional Methods	15	30%
Small-scale farmers (1-3 ha) – Partially Mechanized	10	20%
Medium-scale farmers (4-10 ha) – Partially Mechanized	10	20%
Large-scale farmers (11+ ha) – Fully Mechanized	10	20%
Landowners (NonFarming)	5	10%

This classification ensures that the study captures diverse perspectives on agricultural modernization, ranging from traditional to fully mechanized farming systems.

➢ *Sampling Technique*

This study employed purposive sampling, a non-probability sampling method that involves selecting participants based on specific criteria relevant to the research. Purposive sampling is particularly useful when studying a targeted population with specialized knowledge or experience (Yula, 2023).

In this study, participants were selected from Santo Domingo, Nueva Ecija, focusing on farmers who have experience with both traditional and mechanized farming methods. The selection criteria includes farm size, level of mechanization, and willingness to share insights on the challenges and benefits of modernization. A total of 50 farmers were chosen to provide a well-rounded perspective on the impact of agricultural mechanization in the area. By using purposive sampling, this study ensures that the selected participants can provide relevant and detailed insights into how modernization affects small-scale farmers, making the findings more meaningful and applicable to similar agricultural communities.

➢ *Research Instrument*

This study employed a quantitative research design, utilizing purposive sampling through a survey format. To gather essential data on the impact of agricultural modernization on local farmers, the researchers developed a questionnaire for a face-to-face survey. The survey directly addressed the research objectives, ensuring all questions were relevant and focused. Printed copies of the questionnaire were then distributed to participants to gather their perspectives on the effects of agricultural modernization on their livelihoods. Data analysis tools were subsequently employed to evaluate the overall findings, leading to a comprehensive understanding of the study. The researchers had carefully crafted the questionnaire to guarantee its focus and accuracy in relation to the study. This ensured that participants could provide reliable answers critical to the research.

➢ *Data Gathering Procedure*

To gain a deeper understanding of local farmers' issues and perspectives regarding agricultural modernization, the researchers utilized a printed questionnaire to gather data on their experiences and viewpoints. This method allowed for broader access to information and faster data processing. The researchers designed the printed questionnaire with clear and relevant questions before distributing it to a diverse group of participants. As responses were collected, the researchers monitored progress and addressed any concerns that arose.

Once enough data was obtained, it was analyzed using statistical methods to identify patterns and draw conclusions. The analyzed data may have been exported for further analysis or collaboration, while maintaining participant confidentiality. Finally, the researchers reviewed and interpreted the results, considering existing research and ethical considerations like data privacy and participant confidentiality. Following these steps ensured a well-structured and ethical data collection and analysis process using a printed questionnaire.

➢ *Data Analysis*

The data collected from farmer surveys were analyzed using three key statistical methods to gain meaningful insights into the impact of modernization. The weighted mean was calculated to determine the average response while considering the significance of each answer, ensuring a more accurate representation of farmers' perspectives. Frequency counts were used to identify common trends by measuring how often specific responses appeared, providing a clearer understanding of dominant patterns. To examine relationships between variables, Pearson's r correlation was applied, measuring the strength and direction of the association between modernization practices and farmer outcomes. A correlation value close to 1 indicated a strong positive relationship, suggesting that modernization led to improved outcomes, while a value near -1 signified a negative relationship, implying a decline in outcomes. A coefficient of 0 suggested no direct connection between the two factors. By utilizing these statistical methods, the study ensured a comprehensive and data-driven analysis of modernization's effects on farmers.

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CHAPTER FOUR
PRESENTATION, ANALYSIS, AND INTERPRETATION OF RESULTS

This chapter presents the results of the study on the impacts of agricultural modernization on small-scale farmers in Santo Domingo, Nueva Ecija. Survey data were analyzed and shown in tables with explanations to answer the research questions. The findings cover the socio-demographic profile of respondents, the effects of modernization on field care, the advantages of agricultural machinery, and other related factors. These results highlight how modernization affects the practices, productivity, and experiences of local farmers.

- *Profile of the Respondents*

Table 2 Age of the Respondents

Age	Frequency	Percentages
20-30	1	2%
31-40	6	12%
41-50	13	26%
51-60	10	20%
61-70	14	28%
71 and above	6	12%
Total	**50**	**100**%

Table 2 presents the distribution of the respondents according to their age. Based on the data, the majority of respondents belong to the 61–70 age group, accounting for 28% (14 out of 50 respondents). This is followed closely by the 41–50 age group, which comprises 26% (13 respondents). The 51–60 age group represents 20% (10 respondents), while the 31–40 age group makes up 12% (6 respondents). The youngest age group, 18–30, has the fewest respondents at only 2% (1 respondent), and the oldest group, 71 years old and above, also accounts for 12% (6 respondents).

This distribution indicates that most of the respondents are middle-aged to elderly, specifically between 41 to 70 years old, making up a significant majority of 74% of the total sample. This supports Ogunsola et al. (2022), who emphasized that older processors, while experienced, may adopt improved processing techniques at a slower rate compared to younger counterparts showing how age can shape openness to innovation in the agricultural sector.

Table 3 Years in Farming

Years in Farming	Frequency	Percentages
0-10	7	14%
11-20	14	28%
21-30	12	24%
31-40	13	26%
41-50	4	8%
Total	**50**	**100**%

Table 3 shows that the majority of respondents have been farming for 11–40 years, accounting for 78% of the total sample. This suggests that most farmers in the study are seasoned practitioners with deep-rooted knowledge and established practices. As Varela et al. (2022) highlighted, farmers' extensive years of experience help them build practical skills and traditional knowledge, which strengthen their resilience and ability to adapt to changing conditions. Meanwhile, only 14% have 0–10 years of experience, indicating a relatively low number of newcomers entering farming.

These results highlight the importance of targeting capacity-building efforts toward experienced farmers while also encouraging younger or newer farmers to sustain agricultural productivity in the long term.

Table 4 Farm Size of the Respondents

Farm Size	Frequency	Percentages
1-1.5	24	48%
1.6-2	24	48%
Above 2	2	4%
Total	**50**	**100**%

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Table 4 reveals that nearly all respondents manage relatively small farms, with 48% cultivating 1–1.5 hectares and another 48% cultivating 1.6–2 hectares, while only 4% operate farms larger than 2 hectares. This indicates that the vast majority are smallholder or small-scale farmers, which is crucial for understanding mechanization potential in the area.

Smallholder farms can indeed benefit from mechanization; however, their scale often limits the feasibility of individual machinery investment.

According to Orge et al. (2022), "Rice mechanization in the Philippines generally falls under the small-scale category with the majority of farmers owning only a hectare or less of farmland." The study further notes that small, fragmented, or irregularly shaped fields pose challenges to machinery use, making efficient mechanization difficult without custom or shared services.

Table 5 Income of the Respondents

Income Range (₱)	Frequency	Percentages
₱17,000-₱40,000	11	22%
₱41,000-₱70,000	11	22%
₱71,000-₱100,000	13	26%
₱101,000-150,000	10	20%
₱151,000-₱200,000	5	10%
Total	**50**	**100%**

Table 5 shows that the majority of respondents earn between P71,000 and P100,000, making up 26% of the total sample. This is closely followed by those earning P17,000–P40,000 and P41,000–P70,000, each representing 22%. Respondents earning P101,000–P150,000 account for 20%, while the smallest proportion, 10%, earn P151,000–P200,000.

This indicates that most respondents fall within the low to middle-income brackets, which may influence their capacity to adopt new practices, invest in technology, or respond to economic challenges. The pattern aligns with study of Rapsomanikis (2015) highlighting that households with moderate incomes often face financial constraints that affect their productivity and sustainability strategies.

Table 6 Impact of Modernization on Farmers' Approaches to Field Care

Questions	Weighted Mean	Verbal Description
1. Modernization has made it easier for me to care for my agricultural fields. *(Ang makabagong agrikultura ay nagpadali sa akin na alagaan ang aking mga agrikultural na bukirin.)*	3.44	Strongly Agree
2. I feel more confident in managing my fields with the tools and techniques introduced by modernization. *(Mas komportable akong pamahalaan ang aking mga bukirin gamit ang mga kagamitan at pamamaraan na ipinakilala ng makabagong agrikultura.)*	3.44	Strongly Agree
3. Modern agricultural methods require more time and effort for me to learn and implement. *(Ang mga modernong pamamaraan sa agrikultura ay nangangailangan ng higit pang oras at pagsisikap para sa akin upang matutunan at ipatupad.)*	3.54	Strongly Agree
4. I have become less reliant on traditional farming practices because of modernization. *(Hindi ako gaanong umaasa sa mga tradisyonal na pamamaraan ng pagsasaka dahil sa makabagong agrikultura.)*	3.44	Strongly Agree
5. Modernization has enabled me to care for my fields more efficiently. *(Ang makabagong agrikultura ay nagbigay-daan sa akin upang mas mahusay na alagaan ang aking mga bukirin.)*	3.46	Strongly Agree
6. The introduction of modern technologies has improved the overall health of my crops. *(Ang pagpapakilala ng mga modernong pamamaraan ay nagpabuti sa kabuuang kalusugan ng aking mga pananim.)*	3.36	Strongly Agree
7. I have experienced difficulties in adjusting to the changes in field care brought by modernization. *(Naranasan ko ang mga paghihirap sa pag-angkop sa mga pagbabago sa pangangalaga ng bukirin dulot ng makabagong agrikultura.)*	3.28	Strongly Agree
8. Modernization has allowed me to monitor and manage my fields more effectively. *(Ang makabagong agrikultura ay nagbigay-daan sa akin upang mas epektibong subaybayan at pamahalaan ang aking mga bukirin.)*	2.98	Agree

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9. I believe that modernization has improved my decision-making in field management. *(Naniniwala akong ang makabagong agrikultura ay nagpabuti sa aking kakayahang magdesisyon sa pamamahala ng bukirin.)*	2.98	Agree
10. My approach to caring for my fields is significantly different due to the influence of agricultural modernization. *(Ang aking pamamaraan sa pangangalaga ng aking mga bukirin ay lubos na naiiba dahil sa impluwensya ng makabagong agrikultura.)*	2.92	Agree
Average Weighted Mean	**3.28**	**Strongly Agree**

Legend: 1.00-1.74 – Strongly Disagree; 1.75-2.49 –Disagree; 2.50-3.24 – Agree; 3.25-4.00 – Strongly Agree

Table 6 shows that most farmers agree that modernization has helped them take better care of their fields. The overall average weighted mean is 3.28, which falls under "Strongly Agree." This means that many farmers feel that using modern tools and techniques makes their work easier and more efficient. For example, the statements *"Modernization has made it easier for me to care for my agricultural fields"* and *"I feel more confident in managing my fields with the tools and techniques introduced by modernization"* both received a high weighted mean of 3.44, showing that farmers feel more capable in handling their tasks with the help of modern technology.

In addition, statements like *"Modernization has enabled me to care for my fields more efficiently"* (3.46) and *"The introduction of modern technologies has improved the overall health of my crops"* (3.36) also received strong agreement, meaning that farmers see positive changes in how they manage their land and crops. On the other hand, some items received slightly lower scores. For example, the statement *"I have experienced difficulties in adjusting to the changes in field care brought by modernization"* scored 3.28, and *"Modernization has allowed me to monitor and manage my fields more effectively"* scored only 2.98, which means some farmers still find it a bit hard to adjust to these changes.

These findings align with Bautista et al.(2017), which examined Filipino farmers' perceptions of mechanization and land reform. The study found that while many farmers saw machinery and new practices as helpful in easing their workload and improving efficiency, concerns about cost, complexity, and the need for technical skills were common. Overall, the data suggests that modernization is positively reshaping field care for local farmers, but targeted efforts—such as training programs and support services—are still needed to maximize its benefits and overcome adaptation challenges.

Table 7 Advantages of Using Agricultural Machinery

Questions	Weighted Mean	Verbal Description
1. Using agricultural machinery has significantly increased my farm productivity. *(Ang paggamit ng makinaryang pang-agrikultura ay lubos na nagpalakas ng produktibidad ng aking bukirin.)*	3.48	Strongly Agree
2. Agricultural machinery has helped me complete fieldwork more quickly and efficiently. *(Ang makinaryang pang-agrikultura ay nakatulong sa akin na matapos ang mga gawain sa bukirin nang mas mabilis at epektibo.)*	3.32	Strongly Agree
3. The use of agricultural machinery has improved the overall quality of my crops. *(Ang paggamit ng makinaryang pang-agrikultura ay nagpabuti sa kabuuang kalidad ng aking mga pananim.)*	3.16	Agree
4. Agricultural machinery has reduced the physical labor required on my farm. *(Ang makinaryang pang-agrikultura ay nagbawas sa pisikal na paggawa na kinakailangan sa aking bukirin.)*	3.09	Agree
5. Using agricultural machinery has allowed me to manage larger areas of land with less effort. *(Ang paggamit ng makinaryang pang-agrikultura ay nagbigay-daan sa akin upang pamahalaan ang mas malalaking lupain na may kaunting pagsisikap.)*	3.26	Strongly Agree
6. Agricultural machinery has contributed to more precise planting and harvesting on my farm. *(Ang makinaryang pang-agrikultura ay nakatulong sa mas tumpak na pagtatanim at pag-ani sa aking bukirin.)*	3.3	Strongly Agree
7. The use of machinery has led to increased profitability on my farm. *(Ang paggamit ng makinarya ay nagdulot ng mas mataas na kita sa aking bukirin.)*	2.54	Agree
8. Agricultural machinery has improved the sustainability of my farming practices. *(Ang makinaryang pang-agrikultura ay nagpabuti sa sustainability ng aking mga pamamaraan ng pagsasaka.)*	3.18	Agree

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9. I find that agricultural machinery offers a high return on investment for my farm. *(Natuklasan kong ang makinaryang pang-agrikultura ay nag-aalok ng mataas na kita mula sa investment para sa aking bukirin.)*	3.14	StronglyAgree
10. The use of machinery has enhanced my ability to compete in the market. *(Ang paggamit ng makinarya ay nagpahusay sa aking kakayahang makipagkumpetensya sa merkado.)*	3.06	Agree
Average Weighted Mean	**3.15**	**Agree**

Legend: 1.00-1.74 – Strongly Disagree; 1.75-2.49 –Disagree; 2.50-3.24 – Agree; 3.25-4.00 – Strongly Agree

The table 7 illustrates the perceived advantages of using agricultural machinery among local farmers. The overall average weighted mean of 3.15, which corresponds to "Agree," indicates that farmers generally recognize the positive impact of agricultural machinery on their work. In particular, the statement *"Using agricultural machinery has significantly increased my farm productivity"* received the highest score of 3.48**,** showing that many farmers believe mechanization directly contributes to increased crop output. Likewise, items like *"Machinery helps me complete fieldwork more quickly and efficiently"* (3.32), and *"Machinery contributes to more precise planting and harvesting"* (3.30) reflect strong agreement that machinery saves time and boosts accuracy in operations.

Moreover, responses also suggest that farmers appreciate how machinery reduces physical labor (3.09) and allows them to manage larger land areas with less effort (3.26). These results align with the growing interest in modernizing agricultural practices to boost efficiency and sustainability. However, some aspects received relatively lower ratings, such as *"The use of machinery has led to increased profitability"* (2.54) and *"Enhanced ability to compete in the market"* (3.06), implying that not all farmers experience immediate financial gains or market competitiveness from using machines. This could be due to barriers such as maintenance costs, limited training, or lack of access to modern equipment.

These findings are supported by Bautista et al. (2024), who observe that while mechanization in the Philippines enhances productivity and efficiency, its adoption is still limited by factors such as high costs, insufficient technical knowledge, and poor infrastructure. Their study emphasizes the importance of affordable machinery, training programs, and cooperative schemes to ensure that farmers can fully benefit from mechanization's advantage.

Table 8 Disadvantages of Using Agricultural Machinery

Questions	Weighted Mean	Verbal Description
1. Agricultural machinery has been expensive to maintain and repair. *(Mahal ang pagmamantina at pagkukumpuni ng makinaryang pang-agrikultura.)*	3.46	Strongly Agree
2. I have faced difficulties in learning how to operate agricultural machinery effectively. *(Naharap ako sa mga paghihirap sa pag-aaral kung paano epektibong patakbuhin ang makinaryang pang-agrikultura.)*	3.38	Strongly Agree
3. The use of agricultural machinery has led to environmental issues on my farm, such as soil compaction. *(Ang paggamit ng makinaryang pang-agrikultura ay nagdulot ng mga isyung pangkapaligiran sa aking bukirin, tulad ng soil compaction.)*	3.28	Strongly Agree
4. Agricultural machinery has increased my dependence on external suppliers and service providers. *(Ang makinaryang pang-agrikultura ay nagpalala ng aking pag-asa sa mga panlabas na supplier at service provider.)*	3.39	Strongly Agree
5. The initial cost of purchasing agricultural machinery has been a financial burden. *(Ang paunang gastos sa pagbili ng makinaryang pang-agrikultura ay naging pasanin sa pera.)*	3.18	Agree
6. Agricultural machinery has limited my ability to grow certain types of crops that require more manual care. *(Ang makinaryang pang-agrikultura ay naglilimita sa aking kakayahan na magtanim ng ilang uri ng pananim na nangangailangan ng higit pang manual na pangangalaga.)*	3.3	Strongly Agree
7. The reliance on machinery has reduced the personal connection I have with my fields. *(Ang pag-asa sa makinarya ay nagbawas sa personal na koneksyon na mayroon ako sa aking mga bukirin.)*	2.92	Agree
8. I have experienced downtime in my operations due to machinery breakdowns. *(Naranasan ko ang pagkawala ng oras sa aking operasyon dulot ng pagkasira ng makinarya.)*	3.06	Agree
9. The use of agricultural machinery has contributed to a loss of traditional farming knowledge and skills. *(Ang paggamit ng makinaryang pang-agrikultura ay nagdulot ng pagkawala ng mga kaalaman at kasanayan sa tradisyonal na pagsasaka.)*	2.64	Agree

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10. Agricultural machinery has created challenges in managing small-scale or irregular field layouts. *(Ang makinaryang pang-agrikultura ay lumikha ng mga hamon sa pamamahala ng maliliit na sukat o hindi regular na ayos ng bukirin.)*	2.64	Agree
Average Weighted Mean	**3.12**	**Agree**

Legend: 1.00-1.74 – Strongly Disagree; 1.75-2.49 –Disagree; 2.50-3.24 – Agree; 3.25-4.00 – Strongly Agree

Table 8 presents the perceived disadvantages of using agricultural machinery among local farmers. The average weighted mean of 3.12, which corresponds to "Agree," suggests that farmers acknowledge several challenges associated with machinery use. The most prominent concerns include high maintenance and repair costs (3.46, "Strongly Agree"), difficulties in learning effective operation (3.38, "Strongly Agree"), and environmental issues like soil compaction (3.28, "Strongly Agree"). A significant number of farmers also reported increased dependence on external suppliers and service providers (3.39, "Strongly Agree"). The high initial purchase cost was also a considerable financial burden for many (3.18, "Agree"). Other challenges cited include limitations on growing certain crops requiring manual care (3.30, "Strongly Agree"), reduced personal connection with their fields (2.92, "Agree"), operational downtime due to breakdowns (3.06, "Agree"), loss of traditional farming knowledge (2.64, "Agree"), and difficulties managing small-scale or irregular field layouts (2.64, "Agree").

The findings align with Daum and Birner's (2020) article that challenges nine common myths about agricultural mechanization in Africa, such as the belief that mechanization always reduces employment or cannot work for smallholders. Their findings suggest that these generalizations are often inaccurate and that the success of mechanization depends on local conditions like infrastructure, access to finance, and support systems. The authors advocate for inclusive strategies that integrate modern tools with traditional practices instead of replacing them. They highlight the potential of shared service models, culturally sensitive policies, and small-scale technologies to make mechanization accessible, efficient, and sustainable—particularly in rural communities where farming traditions still shape agricultural choices.

Table 9 Farmers' Perceptions of Modern Farming Practices

Questions	Weighted Mean	Verbal Description
1. I believe that modern farming practices have helped me increase my crop yield. *(Naniniwala ako na ang makabagong paraan ng pagsasaka ay nakatulong upang maparami ang aking ani.)*	3.52	Strongly Agree
2. I have noticed an improvement in my income since adopting modern farming methods. *(Napansin ko ang pagtaas ng aking kita mula nang gumamit ako ng makabagong pamamaraan ng pagsasaka.)*	3.42	Strongly Agree
3. I find modern farming techniques more efficient compared to traditional methods. *(Mas epektibo para sa akin ang makabagong paraan ng pagsasaka kumpara sa tradisyonal na paraan.)*	3.4	Strongly Agree
4. I think modern equipment and technology have reduced my workload in farming. *(Pakiramdam ko, nabawasan ang bigat ng aking trabaho dahil sa makabagong kagamitan at teknolohiya sa pagsasaka.)*	3.34	Strongly Agree
5. I believe that modern farming helps in reducing crop losses due to pests and diseases. *(Naniniwala ako na ang makabagong pagsasaka ay nakakatulong upang mabawasan ang pagkasira ng ani dahil sa peste at sakit.)*	3.22	Agree
6. I feel that modern farming techniques require too much investment, making it difficult for small farmers like me. *(Pakiramdam ko, nangangailangan ng malaking puhunan ang makabagong paraan ng pagsasaka, kaya mahirap ito para sa maliliit na magsasaka tulad ko.)*	3.24	Agree
7. I believe that using modern farming methods allows me to save more time and effort. *(Naniniwala ako na ang paggamit ng makabagong paraan ng pagsasaka ay nakakatulong upang makatipid ako ng oras at pagod.)*	3.18	Agree
8. I have seen an increase in the quality of my produce after adopting modern farming techniques. *(Napansin ko ang pagbuti ng kalidad ng aking ani matapos gumamit ng makabagong pamamaraan ng pagsasaka.)*	2.9	Agree
9. I think modern farming is beneficial, but I need more support and training to fully adopt it. *(Sa tingin ko, kapaki-pakinabang ang makabagong pagsasaka, pero kailangan ko pa ng sapat na suporta at pagsasanay upang magamit ito nang husto.)*	2.92	Agree
10. I feel confident in using modern farming techniques because they are easy to understand and apply. *(Kumpiyansa akong gamitin ang makabagong pamamaraan ng pagsasaka dahil madali itong maintindihan at ipatupad.)*	2.52	Agree

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Average Weighted Mean	3.16	Agree

Legend: 1.00-1.74 – Strongly Disagree; 1.75-2.49 –Disagree; 2.50-3.24 – Agree; 3.25-4.00 – Strongly Agree

Table 9 explores farmers' views on modern farming practices in general. The average weighted mean of 3.16 ("Agree") shows a generally positive but not overwhelmingly enthusiastic attitude. The highest agreement is found in statements regarding increased crop yield (3.52, "Strongly Agree"), improved income (3.42, "Strongly Agree"), and increased efficiency compared to traditional methods (3.4, "Strongly Agree"). This suggests that the perceived benefits of modern farming are primarily economic and efficiency-related. However, statements about high investment costs (3.24, "Agree") and the need for more support and training (2.92, "Agree") indicate that financial constraints and skill gaps remain substantial hurdles. The relatively low score for "I feel confident in using modern farming techniques because they are easy to understand and apply" (2.52, "Agree") also points to a need for user-friendly technology and better training.

The findings align with the Food and Agriculture Organization (FAO (2015), The State of Food and Agriculture: Social Protection and Agriculture – Breaking the Cycle of Rural Poverty, which explores how combining social protection with agricultural development can effectively reduce rural poverty and hunger. The report emphasizes that most of the world's poorest people live in rural areas and rely on agriculture for their livelihoods. However, they often face chronic poverty and food insecurity that passes from one generation to the next. FAO argues that social protection programs—like cash transfers, food assistance, and public employment—can help vulnerable households meet basic needs, invest in their farms, and become more resilient. When paired with agricultural support such as access to markets, training, and infrastructure, these measures can empower smallholder farmers to increase productivity and income.

Table 10 Compatibility of Modern Farming Methods with Traditional Practices

Questions	Weighted Mean	Verbal Description
1. Modern farming methods can be easily integrated with my traditional farming practices. *(Madaling maisama ang makabagong paraan ng pagsasaka sa aking tradisyonal na pamamaraan.)*	3.24	Agree
2. I feel comfortable using modern farming techniques alongside my traditional methods. *(Kampante akong gamitin ang makabagong pamamaraan ng pagsasaka kasabay ng tradisyonal na paraan.)*	3.32	Strongly Agree
3. The use of modern farming technology does not require me to completely abandon my traditional practices. *(Ang paggamit ng makabagong pamamaraan sa pagsasaka ay hindi nangangailangan na talikuran ko nang buo ang aking tradisyonal na paraan.)*	3.46	Strongly Agree
4. I believe that modern farming methods improve upon traditional techniques rather than replace them. *(Naniniwala ako na pinapahusay ng makabagong pagsasaka ang tradisyonal na pamamaraan sa halip na palitan ito.)*	3.32	Strongly Agree
5. I find it difficult to balance modern farming techniques with my traditional farming knowledge. *(Nahihirapan akong pagsabayin ang makabagong pamamaraan ng pagsasaka sa aking tradisyonal na kaalaman sa pagsasaka.)*	3.04	Agree
6. Modern farming methods respect and support the cultural practices of local farmers. *(Iginagalang at sinusuportahan ng makabagong paraan ng pagsasaka ang mga tradisyunal na kaugalian ng mga lokal na magsasaka.)*	3.32	Strongly Agree
7. I believe that the combination of traditional and modern farming practices leads to better productivity. (*Naniniwala ako na ang pagsasama ng tradisyonal at makabagong pamamaraan ng pagsasaka ay nagpapataas ng ani.)*	3.18	Agree
8. Some modern farming techniques conflict with the traditional beliefs and practices of our community. (*May ilang makabagong paraan ng pagsasaka na hindi akma sa tradisyonal na paniniwala at gawain ng aming komunidad.)*	2.94	Agree
9. The government and agricultural organizations provide enough support to help farmers transition from traditional to modern farming. *(Sapat ang suporta ng gobyerno at mga organisasyon sa agrikultura upang matulungan ang mga magsasaka na lumipat mula sa tradisyonal patungo sa makabagong pagsasaka.)*	2.52	Agree
10. I feel that modern farming methods should be adjusted to better fit the needs and traditions of local farmers. *(Sa tingin ko, kailangang iakma ang makabagong paraan ng pagsasaka upang mas tumugma sa pangangailangan at tradisyon ng mga lokal na magsasaka.)*	2.7	Agree
Average Weighted Mean	**3.10**	**Agree**

Legend: 1.00-1.74 – Strongly Disagree; 1.75-2.49 –Disagree; 2.50-3.24 – Agree; 3.25-4.00 – Strongly Agree

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Table 10 investigates the perceived compatibility between modern and traditional farming practices. An average weighted mean of 3.10 ("Agree") indicates a moderate level of compatibility. The highest agreement is observed for statements emphasizing the ease of integrating modern methods with traditional ones (3.46, "Strongly Agree") and that modern methods enhance rather than replace traditional techniques (3.32, "Strongly Agree"). This suggests that farmers see a potential for synergistic approaches. However, statements related to the difficulty of balancing modern and traditional techniques (3.04, "Agree"), conflicts with traditional beliefs (2.94, "Agree"), and insufficient government support for the transition (2.52, "Agree") reveal challenges in seamlessly merging the two systems. This highlights the need for policies and programs that support the gradual integration of modern methods while respecting and preserving traditional practices.

These findings are supported by Giller et al. (2015) argue that while Conservation Agriculture(CA)—which promotes no-till farming, soil cover, and crop rotation—has been effective in some large-scale farming systems, it isn't universally beneficial. In smallholder tropical settings, CA has shown mixed results, with limited evidence of increased yields or long-term soil improvement. The authors emphasize that promoting CA as a universal solution overlooks the diverse challenges and needs of smallholder farmers. Instead, they advocate for a more adaptable, farmer-centered approach. They propose shifting from a rigid CA model to one based on Systems Agronomy, which tailors agricultural strategies to local contexts. This view supports giving farmers a wider range of practical options rather than applying blanket recommendations, recognizing that success in sustainable farming depends on ecological, cultural, and economic factors.

Table 11 Correlation between Farm Size and Adoption of Modern Farming Practices

Variable	Pearson's r	p-value	Interpretation
Age	0.39	0.006	**Moderate positive correlation (Significant)**
Years in Farming	0.22	0.118	**Weak positive correlation (Not significant)**
Farm Size	–0.52	0.001	**Strong negative correlation (Significant)**

Table 11 suggests a compelling connection between farm size and how farmers adapt to modernization in agricultural practices. With a strong negative correlation ($r = –0.52$, $p = 0.001$), the data indicates that as the size of the farmland increases, the degree of change in farming approaches due to modernization tends to decrease. This means that farmers who manage larger plots of land are generally less likely to modify their field care methods in response to modern influences. This can be interpreted to mean that these farmers may have already integrated modern practices—such as mechanization, soil monitoring systems, or advanced irrigation methods—into their routines long before recent modernization efforts became widespread. Consequently, any new technological or procedural changes are either already in place or require minimal adjustment in their operations.

In contrast, small-scale farmers appear to be more affected by modernization, possibly because their traditional, labor-intensive methods are less efficient and more in need of improvement. These farmers are still in the process of adapting to available innovations, such as mobile-accessible weather forecasting, organic inputs, or new pest control technologies, which can significantly change their approach to field management.

Moreover, age also demonstrated a moderate positive correlation ($r = 0.39$, $p = 0.006$), suggesting that older farmers in the sample were more likely to report changes in their farming methods. This could imply a growing openness among seasoned farmers toward innovation, perhaps driven by their awareness of the need to stay competitive or by access to government-supported training programs that promote modern agricultural practices. Interestingly, years of farming experience showed only a weak correlation ($r = 0.22$, $p = 0.118$), indicating that mere experience in the field does not necessarily translate to a willingness or need to adopt new techniques.

These results are supported by previous empirical studies. Schimmelpfennig (2016) reported that large-scale farms in the United States were more likely to adopt precision agriculture tools, including GPS-guided tractors, automatic irrigation systems, and variable-rate technology. This early adoption leads to operational stability, which may reduce the need for ongoing changes in response to newer advancements. Similarly, Rada and Fuglie (2019) highlighted that farm size has a strong positive relationship with technical efficiency and productivity, with larger farms benefiting more from economies of scale and structured management systems that buffer them from the pressure to constantly evolve.

These findings underscore that farm size is a key determinant in the responsiveness of farmers to modernization. While modernization aims to uplift the agricultural sector as a whole, its effects are not uniformly felt. Smaller farms often experience more dramatic changes due to the gap between their traditional practices and modern standards. This disparity highlights the need for targeted support programs that ensure equitable access to modernization benefits, especially for smallholders who are undergoing more significant transitions.

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CHAPTER FIVE
SUMMARY, CONCLUSION, AND RECOMMENDATIONS

A. Summary of Findings

➢ *Socio-Demographic Profile of the Respondents*

- *Age of Respondents*

Based on the gathered data, a large portion of the respondents are aged between 61–70 years old, comprising 28% of the total. Close behind are those aged 41–50, representing 26%, while farmers aged 51–60 make up 20% of the group. The smallest segment belongs to the youngest bracket, 18–30 years old, with only 2%. This pattern suggests that most of the farmers surveyed are in their middle to late years, indicating long-standing experience in the field but possibly a slower pace in adopting new farming methods.

- *Years in Farming*

When it comes to farming experience, 78% of the respondents have been working in the agricultural sector for 11–40 years. This means that most are seasoned farmers with deep-rooted knowledge and established practices in their communities. Meanwhile, only a small group, 14%, have less than 10 years of farming experience, showing that there are fewer newcomers venturing into farming. This emphasizes the need to continue supporting older farmers while encouraging new generations to sustain and modernize agricultural work.

- *Farm Size of the Respondents*

The data indicates that almost all of the respondents cultivate relatively small plots of land. Nearly half (48%) manage farms between 1 to 1.5 hectares, while another 48% have farms ranging from 1.6 to 2 hectares. Only a small fraction, 4%, work on farms larger than 2 hectares. This means that most of the farmers in the study are smallholders, which could affect their ability to expand production or fully utilize larger-scale machinery. Supporting these farmers with appropriate resources and training could help them maximize productivity despite their limited land areas.

- *Income of the Respondents*

The data shows that most respondents earn between ₱71,000 and ₱100,000 per month, which is 26% of the total. About 22% earn between ₱17,000–₱40,000 and another 22% earn ₱41,000–₱70,000. Only 10% earn above ₱151,000. This means that most of the farmers belong to low to middle-income groups, which might affect their ability to buy farming machines or try new technologies.

➢ *Impact of Modernization on Farmers' Approaches to Field Care*

The data shows that modernization has a positive effect on how farmers care for their fields. The overall average weighted mean is 3.28, which means most respondents strongly agree that modernization helped improve field care. The data shows improvements in field management, crop health, and efficiency. However, some farmers reported difficulty adjusting to new practices, as seen in lower scores like 2.98. This means modernization helps most farmers, but not all are fully comfortable with the changes yet.

➢ *Effects of Using Agricultural Machineries*

- *Advantages of Using Agricultural Machinery*

The data shows that farmers see clear benefits in using agricultural machines. The average weighted mean is 3.15, which means they agree with the positive effects. The highest score, 3.48, shows that farmers believe machines increase their productivity. Other results show faster work and less physical labor. But some areas, like profit (2.54) and market competitiveness (3.06), received lower scores. This suggests that while machines help, not all farmers experience big income gains, possibly due to cost, lack of training, or limited access.

- *Disadvantages of Using Agricultural Machinery*

The data highlights the perceived disadvantages of agricultural machinery as expressed by local farmers, with an overall weighted mean of 3.12, indicating general agreement on the presence of several challenges. Among the most strongly emphasized concerns are high maintenance and repair costs (3.46), difficulty in learning how to operate the equipment effectively (3.38), and negative environmental impacts such as soil compaction (3.28). Many farmers also reported a growing dependence on external suppliers (3.39), suggesting a shift away from self-reliant farming practices. Financial concerns remain significant, particularly the burden of high initial purchase costs (3.18). Additional issues include limitations on cultivating crops that require manual care (3.30) and a perceived loss of emotional connection with the land due to mechanization (2.92). Technical difficulties also arise, including frequent downtime from breakdowns (3.06), challenges with small or irregular field layouts (2.64), and a gradual loss of traditional farming knowledge (2.64). These findings collectively reflect that while modern machinery offers practical advantages, it also introduces a complex mix of financial, environmental, and cultural concerns that must be carefully addressed.

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➢ *Farmers' Perceptions of Modern Farming Practices*

The data reveals that farmers generally view modern farming practices in a positive light, as reflected by the overall weighted mean of 3.16, indicating agreement. The strongest support was for statements highlighting the economic and productivity advantages of these methods: increased crop yields (3.52), improved income (3.42), and greater efficiency compared to traditional practices (3.4) all received high agreement levels, suggesting that financial gains and operational improvements are key motivators for adoption. However, challenges persist. Farmers expressed concerns over high investment costs (3.24) and emphasized the need for additional support and training (2.92). Notably, their confidence in understanding and applying modern techniques scored relatively low (2.52), pointing to the complexity of the technology and a gap in accessible, farmer-friendly instruction. These findings underscore a clear need for more inclusive educational initiatives and support systems to ensure that the benefits of modernization can be fully realized across farming communities.

➢ *Compatibility of Modern Farming Methods with Traditional Practices*

The table reveals a moderate level of compatibility (average weighted mean of 3.10) between modern and traditional farming practices. Farmers strongly agree that integrating modern methods with traditional ones is easy and enhances rather than replaces traditional techniques. However, challenges remain in balancing modern and traditional techniques, resolving conflicts with traditional beliefs, and securing sufficient government support for the transition. This highlights the need for policies and programs supporting gradual integration while respecting traditional practices.

B. Conclusions

- The findings reveal that the majority of farmers are in their middle to senior years, demonstrating extensive experience in agriculture. However, the minimal presence of younger farmers indicates a potential generational gap that may threaten the sustainability of local farming practices if not addressed. The fact that most farmers have been in the industry for 11–40 years further reinforces their valuable expertise but also suggests a pressing need for succession planning. Small farm sizes dominate the landscape, which limits opportunities for large-scale mechanization but highlights the importance of tailored support for smallholders. Furthermore, the data shows that most farmers fall within low to middle-income brackets, implying financial constraints that may hinder their capacity to adopt new technologies or expand operations.
- Modernization has generally brought about improvements in how farmers manage and care for their fields, leading to better crop health, higher efficiency, and improved field conditions. Despite this, some farmers still struggle to fully adapt, indicating that while the benefits of modernization are significant, its implementation needs to be more inclusive and farmer-friendly.
- Farmers acknowledge that machinery significantly boosts productivity, reduces manual labor, and accelerates farming processes. However, gains in profit and market competitiveness are not equally experienced by all, suggesting that the benefits of mechanization may be unevenly distributed due to barriers such as high costs and limited access.
- While machines are helpful, they also introduce new challenges. High maintenance expenses, operational difficulties, dependence on external suppliers, and environmental concerns like soil compaction are among the prominent issues. Additionally, the use of machinery may erode traditional knowledge and the farmers' emotional connection with their land, highlighting the need for a balanced approach.
- Farmers generally hold positive views about modern farming, recognizing its potential to increase yields, income, and efficiency. However, they also express apprehension about the substantial financial investments required and the lack of accessible training and support. The lower confidence in applying modern techniques signals a gap that must be addressed through better extension services and practical, hands-on learning opportunities.
- There is moderate agreement that modern and traditional farming practices can complement each other, enhancing rather than replacing age-old techniques. However, tensions can arise due to conflicting beliefs and inadequate institutional support, indicating a need for carefully crafted policies that encourage gradual, respectful integration of modern methods into traditional systems.

C. Recommendations

- Establish comprehensive youth engagement and succession planning programs to attract and inspire the next generation of farmers. This should include scholarships, apprenticeships, and mentorship with experienced farmers, alongside financial assistance and technical support tailored to the needs of smallholders to help them adopt appropriate technologies sustainably.
- Design and implement inclusive, farmer-centered modernization initiatives that provide practical, easy-to-understand training, field demonstrations, and continuous on-the-ground support to ensure that all farmers, regardless of age or capacity, can fully benefit from modern agricultural practices.
- Promote fair and equal access to agricultural machinery by introducing cooperative ownership schemes, community-based rental services, and government-backed financing programs. This will empower small-scale farmers to improve productivity without facing prohibitive costs.
- Support a balanced and sustainable approach to mechanization by offering accessible maintenance services, training on proper and safe machine operation, and promoting the use of eco-friendly equipment. At the same time, preserve valuable traditional farming knowledge to maintain cultural heritage and environmental stewardship.

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- Strengthen agricultural extension services by delivering hands-on, practical training, on-farm demonstrations, and financial literacy workshops. This will build farmers' confidence and skills to adopt modern techniques effectively, ensuring they gain maximum benefit from new technologies.
- Craft policies and community programs that encourage the respectful integration of modern and traditional farming practices. Provide platforms for knowledge-sharing, support community dialogues, and ensure institutional backing to harmonize innovation with time-honored methods, fostering sustainable and resilient farming systems.

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APPENDICES
APPENDIX A

➢ *Questionnaire*

"From Traditional to Modern: Understanding the Impact of Agricultural Changes on Farmers"

Name (Optional):_____

Age:_____

Income:_____

Years in farming: _____

Farm Size:_____

➢ *Instructions: Please express your level of agreement with the following statements using a 4-point Likert scale:*

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

➢ *Simply Check (✓) the Box that Corresponds to your Answer for Each Statement.*

Your answers will provide valuable information to improve support systems for student researchers. Please answer each question honestly. All answers will remain confidential and will only be used for research purposes.

Impact of Modernization on Farmers' Approaches to Field Care	**1**	**2**	**3**	**4**
1. Modernization has made it easier for me to care for my agricultural fields. *(Ang makabagong agrikultura ay nagpadali sa akin na alagaan ang aking mga agrikultural na bukirin.)*				
2. I feel more confident in managing my fields with the tools and techniques introduced by modernization. *(Mas komportable akong pamahalaan ang aking mga bukirin gamit ang mga kagamitan at pamamaraan na ipinakilala ng makabagong agrikultura.)*				
3. Modern agricultural methods require more time and effort for me to learn and implement. *(Ang mga modernong pamamaraan sa agrikultura ay nangangailangan ng higit pang oras at pagsisikap para sa akin upang matutunan at ipatupad.)*				
4. I have become less reliant on traditional farming practices because of modernization. *(Hindi ako gaanong umaasa sa mga tradisyonal na pamamaraan ng pagsasaka dahil sa makabagong agrikultura.)*				
5. Modernization has enabled me to care for my fields more efficiently. *(Ang makabagong agrikultura ay nagbigay-daan sa akin upang mas mahusay na alagaan ang aking mga bukirin.)*				
6. The introduction of modern technologies has improved the overall health of my crops. *(Ang pagpapakilala ng mga modernong pamamaraan ay nagpabuti sa kabuuang kalusugan ng aking mga pananim.)*				
7. I have experienced difficulties in adjusting to the changes in field care brought by modernization. *(Naranasan ko ang mga paghihirap sa pag-angkop sa mga pagbabago sa pangangalaga ng bukirin dulot ng makabagong agrikultura.)*				
8. Modernization has allowed me to monitor and manage my fields more effectively. *(Ang makabagong agrikultura ay nagbigay-daan sa akin upang mas epektibong subaybayan at pamahalaan ang aking mga bukirin.)*				
9. I believe that modernization has improved my decision-making in field management. *(Naniniwala akong ang makabagong agrikultura ay nagpabuti sa aking kakayahang magdesisyon sa pamamahala ng bukirin.)*				
10. My approach to caring for my fields is significantly different due to the influence of agricultural modernization. *(Ang aking pamamaraan sa pangangalaga ng aking mga bukirin ay lubos na naiiba dahil sa impluwensya ng makabagong agrikultura.)*				

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Advantages of Using Agricultural Machinery	**1**	**2**	**3**	**4**
1. Using agricultural machinery has significantly increased my farm productivity. *(Ang paggamit ng makinaryang pang-agrikultura ay lubos na nagpalakas ng produktibidad ng aking bukirin.)*				
2. Agricultural machinery has helped me complete fieldwork more quickly and efficiently. *(Ang makinaryang pang-agrikultura ay nakatulong sa akin na matapos ang mga gawain sa bukirin nang mas mabilis at epektibo.)*				
3. The use of agricultural machinery has improved the overall quality of my crops. *(Ang paggamit ng makinaryang pang-agrikultura ay nagpabuti sa kabuuang kalidad ng aking mga pananim.)*				
4. Agricultural machinery has reduced the physical labor required on my farm. *(Ang makinaryang pang-agrikultura ay nagbawas sa pisikal na paggawa na kinakailangan sa aking bukirin.)*				
5. Using agricultural machinery has allowed me to manage larger areas of land with less effort. *(Ang paggamit ng makinaryang pang-agrikultura ay nagbigay-daan sa akin upang pamahalaan ang mas malalaking lupain na may kaunting pagsisikap.)*				
6. Agricultural machinery has contributed to more precise planting and harvesting on my farm. *(Ang makinaryang pang-agrikultura ay nakatulong sa mas tumpak na pagtatanim at pag-ani sa aking bukirin.)*				
7. The use of machinery has led to increased profitability on my farm. *(Ang paggamit ng makinarya ay nagdulot ng mas mataas na kita sa aking bukirin.)*				
8. Agricultural machinery has improved the sustainability of my farming practices. *(Ang makinaryang pang-agrikultura ay nagpabuti sa sustainability ng aking mga pamamaraan ng pagsasaka.)*				
9. I find that agricultural machinery offers a high return on investment for my farm. *(Natuklasan kong ang makinaryang pang-agrikultura ay nag-aalok ng mataas na kita mula sa investment para sa aking bukirin.)*				
10. The use of machinery has enhanced my ability to compete in the market. *(Ang paggamit ng makinarya ay nagpahusay sa aking kakayahang makipagkumpetensya sa merkado.)*				

Disadvantages of Using Agricultural Machinery	**1**	**2**	**3**	**4**
1. Agricultural machinery has been expensive to maintain and repair. *(Mahal ang pagmamantina at pagkukumpuni ng makinaryang pang-agrikultura.)*				
2. I have faced difficulties in learning how to operate agricultural machinery effectively. *(Naharap ako sa mga paghihirap sa pag-aaral kung paano epektibong patakbuhin ang makinaryang pang-agrikultura.)*				
3. The use of agricultural machinery has led to environmental issues on my farm, such as soil compaction. *(Ang paggamit ng makinaryang pang-agrikultura ay nagdulot ng mga isyung pangkapaligiran sa aking bukirin, tulad ng soil compaction.)*				
4. Agricultural machinery has increased my dependence on external suppliers and service providers. *(Ang makinaryang pang-agrikultura ay nagpalala ng aking pag-asa sa mga panlabas na supplier at service provider.)*				
5. The initial cost of purchasing agricultural machinery has been a financial burden. *(Ang paunang gastos sa pagbili ng makinaryang pang-agrikultura ay naging pasanin sa pera.)*				
6. Agricultural machinery has limited my ability to grow certain types of crops that require more manual care. *(Ang makinaryang pang-agrikultura ay naglilimita sa aking kakayahan na magtanim ng ilang uri ng pananim na nangangailangan ng higit pang manual na pangangalaga.)*				
7. The reliance on machinery has reduced the personal connection I have with my fields. *(Ang pag-asa sa makinarya ay nagbawas sa personal na koneksyon na mayroon ako sa aking mga bukirin.)*				
8. I have experienced downtime in my operations due to machinery breakdowns. *(Naranasan ko ang pagkawala ng oras sa aking operasyon dulot ng pagkasira ng makinarya.)*				
9. The use of agricultural machinery has contributed to a loss of traditional farming knowledge and skills. *(Ang paggamit ng makinaryang pang-agrikultura ay nagdulot ng pagkawala ng mga kaalaman at kasanayan sa tradisyonal na pagsasaka.)*				
10. Agricultural machinery has created challenges in managing small-scale or irregular field layouts. *(Ang makinaryang pang-agrikultura ay lumikha ng mga hamon sa pamamahala ng maliliit na sukat o hindi regular na ayos ng bukirin.)*				

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Farmers' Perceptions of Modern Farming Practices	1	2	3	4
1. I believe that modern farming practices have helped me increase my crop yield. *(Naniniwala ako na ang makabagong paraan ng pagsasaka ay nakatulong upang maparami ang aking ani.)*				
2. I have noticed an improvement in my income since adopting modern farming methods. *(Napansin ko ang pagtaas ng aking kita mula nang gumamit ako ng makabagong pamamaraan ng pagsasaka.)*				
3. I find modern farming techniques more efficient compared to traditional methods. *(Mas epektibo para sa akin ang makabagong paraan ng pagsasaka kumpara sa tradisyonal na paraan.)*				
4. I think modern equipment and technology have reduced my workload in farming. *(Pakiramdam ko, nabawasan ang bigat ng aking trabaho dahil sa makabagong kagamitan at teknolohiya sa pagsasaka.)*				
5. I believe that modern farming helps in reducing crop losses due to pests and diseases. *(Naniniwala ako na ang makabagong pagsasaka ay nakakatulong upang mabawasan ang pagkasira ng ani dahil sa peste at sakit.)*				
6. I feel that modern farming techniques require too much investment, making it difficult for small farmers like me. *(Pakiramdam ko, nangangailangan ng malaking puhunan ang makabagong paraan ng pagsasaka, kaya mahirap ito para sa maliliit na magsasaka tulad ko.)*				
7. I believe that using modern farming methods allows me to save more time and effort. *(Naniniwala ako na ang paggamit ng makabagong paraan ng pagsasaka ay nakakatulong upang makatipid ako ng oras at pagod.)*				
8. I have seen an increase in the quality of my produce after adopting modern farming techniques. *(Napansin ko ang pagbuti ng kalidad ng aking ani matapos gumamit ng makabagong pamamaraan ng pagsasaka.)*				
9. I think modern farming is beneficial, but I need more support and training to fully adopt it. *(Sa tingin ko, kapaki-pakinabang ang makabagong pagsasaka, pero kailangan ko pa ng sapat na suporta at pagsasanay upang magamit ito nang husto.)*				
10. I feel confident in using modern farming techniques because they are easy to understand and apply. *(Kumpiyansa akong gamitin ang makabagong pamamaraan ng pagsasaka dahil madali itong maintindihan at ipatupad.)*				

Compatibility of Modern Farming Methods with Traditional Practices	1	2	3	4
1. Modern farming methods can be easily integrated with my traditional farming practices. *(Madaling maisama ang makabagong paraan ng pagsasaka sa aking tradisyonal na pamamaraan.)*				
2. I feel comfortable using modern farming techniques alongside my traditional methods. *(Kampante akong gamitin ang makabagong pamamaraan ng pagsasaka kasabay ng tradisyonal na paraan.)*				
3. The use of modern farming technology does not require me to completely abandon my traditional practices. *(Ang paggamit ng makabagong pamamaraan sa pagsasaka ay hindi nangangailangan na talikuran ko nang buo ang aking tradisyonal na paraan.)*				
4. I believe that modern farming methods improve upon traditional techniques rather than replace them. *(Naniniwala ako na pinapahusay ng makabagong pagsasaka ang tradisyonal na pamamaraan sa halip na palitan ito.)*				
5. I find it difficult to balance modern farming techniques with my traditional farming knowledge. *(Nahihirapan akong pagsabayin ang makabagong pamamaraan ng pagsasaka sa aking tradisyonal na kaalaman sa pagsasaka.)*				
6. Modern farming methods respect and support the cultural practices of local farmers. *(Iginagalang at sinusuportahan ng makabagong paraan ng pagsasaka ang mga tradisyunal na kaugalian ng mga lokal na magsasaka.)*				
7. I believe that the combination of traditional and modern farming practices leads to better productivity. (*Naniniwala ako na ang pagsasama ng tradisyonal at makabagong pamamaraan ng pagsasaka ay nagpapataas ng ani.)*				
8. Some modern farming techniques conflict with the traditional beliefs and practices of our community. (*May ilang makabagong paraan ng pagsasaka na hindi akma sa tradisyonal na paniniwala at gawain ng aming komunidad.)*				
9. The government and agricultural organizations provide enough support to help farmers transition from traditional to modern farming. *(Sapat ang suporta ng gobyerno at mga organisasyon sa agrikultura upang matulungan ang mga magsasaka na lumipat mula sa tradisyonal patungo sa makabagong pagsasaka.)*				

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10. I feel that modern farming methods should be adjusted to better fit the needs and traditions of local farmers. *(Sa tingin ko, kailangang iakma ang makabagong paraan ng pagsasaka upang mas tumugma sa pangangailangan at tradisyon ng mga lokal na magsasaka.)*				

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APPENDIX B
RELIABILITY TEST

Impact of Modernization on Farmers' Approaches to Field Care

					SOP 1							
NO.	**1**	**2**	**3**	**4**	**5**		**6**	**7**	**8**	**9**	**10**	
1	3	3	2	4	2		1	2	4	2	4	27
2	1	3	2	4	3		2	1	3	2	2	23
3	3	3	3	4	3		2	2	3	2	2	27
4	3	3	3	2	3		2	4	4	4	2	30
5	3	3	3	2	3		4	4	4	4	4	34
6	3	3	3	2	3		4	4	4	4	4	34
7	3	3	3	3	3		3	4	3	4	4	33
8	3	3	3	3	3		3	3	3	3	3	30
9	4	3	3	3	3		3	3	3	3	3	31
10	3	3	3	3	3		3	3	3	3	3	30
11	3	3	3	3	3		3	3	3	3	3	30
12	3	3	3	3	3		3	3	3	3	3	30
13	3	3	3	3	3		3	3	3	3	3	30
14	4	3	3	3	3		3	3	3	3	3	31
15	3	3	4	3	3		3	3	3	3	3	31
16	3	3	4	3	3		3	3	3	3	3	31
17	3	3	3	3	4		3	3	3	3	3	31
18	4	3	3	3	4		3	3	3	3	3	32
19	4	4	4	3	4		3	3	3	3	3	34
20	4	4	4	3	4		3	3	3	3	3	34
	0.43	0.09	0.3	0.3	0.2		0.4	0.5	0.2	0.3	0.3	7.0275
	VARIABLES						VALUES		INTERNAL CONS			ISTENCY
	# OF ITEMS (K)						10		questiona			ble
	SUM OF THE ITEM VARIABLES						3.1175					
	VARIANCE OF TOTAL SCORE						7.0275					
	CRONBACH'S ALPHA						0.61821					

Advantages of Using Agricultural Machinery

				SOP 2						
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
2	1	2	2	1	1	1	2	1	2	15
2	4	2	2	4	2	2	4	4	4	30
4	4	4	2	4	4	2	4	4	4	36
4	4	4	2	4	4	2	4	4	4	36
4	4	4	2	3	4	2	4	4	4	35
4	4	4	4	3	4	2	3	4	3	35
4	3	3	4	3	4	3	3	3	3	33
4	3	3	4	3	3	3	3	3	3	32

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4	3	3	3	3	3	3	3	3	3	31
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	4	3	3	3	31
3	3	3	3	3	3	4	3	3	3	31
3	3	3	3	3	3	4	3	3	3	31
3	3	3	3	3	3	4	3	3	3	31
0.4	0.4	0.3	0.4	0.3	0.5	0.6	0.2	0.4	0.2	17.5275
	VARIABLES		VALUES		INTERNAL CO	NSISTENCY				
	# OF ITEMS (K)		10		goo	d				
	SUM OF THE ITEM VARIABLES				3.8425					
	VARIANCE OF TOTAL SCORE				17.5275					
	CRONBACH'S ALPHA				0.86753					

Disadvantages of Using Agricultural Machinery

				SOP 3							
1	**2**	**3**	**4**	**5**		**6**	**7**	**8**	**9**	**10**	
2	4	4	4	1		4	2	1	1	2	25
4	4	4	4	4		4	2	2	4	2	34
4	4	4	4	4		4	4	4	4	2	38
4	4	4	4	4		4	4	4	4	2	38
4	4	4	4	4		4	4	4	3	4	39
4	4	3	4	3		3	3	4	3	4	35
4	2	3	3	3		3	3	4	3	4	32
3	3	3	3	3		3	3	3	3	4	31
3	3	3	3	3		3	3	3	3	3	30
3	3	3	3	3		3	3	3	3	3	30
3	3	3	3	3		3	3	3	3	3	30
3	3	3	3	3		3	3	3	3	3	30
3	3	3	3	3		3	3	3	3	3	30
3	3	3	3	3		3	3	3	3	3	30
3	3	3	3	3		3	3	3	3	3	30
3	3	3	3	3		3	3	3	3	3	30
3	3	3	3	3		3	3	3	3	3	30
3	3	3	3	3		3	3	3	3	3	30

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3	3	3	3	3		3	3	3	3	3	30
3	3	3	3	3		3	3	3	3	3	30
0.3	0.3	0.2	0.2	0.4		0.2	0.2	0.5	0.3	0.4	11.44
	VARIABLES			VALUES	INTERNAL CONSIST	ENCY					
	# OF ITEMS (K)			10	good						
	SUM OF THE ITEM VARIABLES					3.035					
	VARIANCE OF TOTAL SCORE					11.44					
	CRONBACH'S ALPHA					0.81634					

Farmers' Perceptions of Modern Farming Practices

				SOP 4							
1	**2**	**3**	**4**	**5**	**6**		**7**	**8**	**9**	**10**	
2	2	2	2	2	2		2	2	1	2	19
2	2	2	2	2	2		2	2	2	2	20
2	4	2	2	2	2		2	2	2	2	22
2	4	2	4	2	2		2	2	4	2	26
2	4	2	4	4	4		2	3	4	3	32
4	3	2	4	4	4		4	3	4	3	35
4	3	3	3	4	4		4	3	3	3	34
4	3	3	3	4	3		4	3	3	3	33
3	3	3	3	4	3		3	3	3	3	31
3	3	3	3	3	3		3	3	3	3	30
3	3	3	3	3	3		3	3	3	3	30
3	3	3	3	3	3		3	3	3	3	30
3	3	3	3	3	3		3	3	3	3	30
3	3	3	3	3	3		3	3	3	3	30
3	3	3	3	3	3		3	3	3	3	30
3	3	3	3	3	3		3	3	3	3	30
3	3	4	3	3	3		3	4	3	4	33
3	3	4	3	3	3		3	4	3	4	33
3	3	4	3	3	3		3	4	3	4	33
3	3	4	3	3	3		3	4	3	4	33
0.39	0.25	0.49	0.3	0.45	0.35		0.39	0.4	0.45	0.4	19.5

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VARIABLES		VALUES		INTERNAL CONSISTEN	CY
# OF ITEMS (K)		10		good	
SUM OF THE ITEM VARIABLES		3.86			
VARIANCE OF TOTAL SCORE		19.51			
CRONBACH'S ALPHA		0.89128082			

Compatibility of Modern Farming Methods with Traditional Practices

				SOP 5						
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
2	2	2	3	2	2	2	2	2	4	23
2	3	4	3	2	4	2	2	4	4	30
4	3	4	3	4	4	4	3	4	4	37
4	3	4	3	4	4	4	3	4	4	37
4	3	4	3	4	4	3	3	4	4	36
4	3	4	3	4	3	3	3	3	2	32
4	3	4	3	4	3	3	3	3	3	33
4	3	4	3	3	3	3	3	3	3	32
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	3	3	3	3	3	30
3	3	3	3	3	2	3	3	3	3	29
3	4	3	3	3	3	3	4	3	3	32
3	4	3	4	3	3	3	4	3	3	33
3	4	3	4	3	3	3	4	3	3	33
3	4	3	4	3	3	3	4	3	3	33
0.36	0.23	0.31	0.13	0.33	0.29	0.2	0.29	0.23	0.26	9.35
	VARIABLES				VALU	ES	INTERNAL CONSISTENCY			
	# OF ITEMS (K)				10		acceptable			
	SUM OF THE ITEM VARIABLES				2.62					

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	VARIANCE OF TOTAL SCORE		9.35			
	CRONBACH'S ALPHA		0.7997	623		

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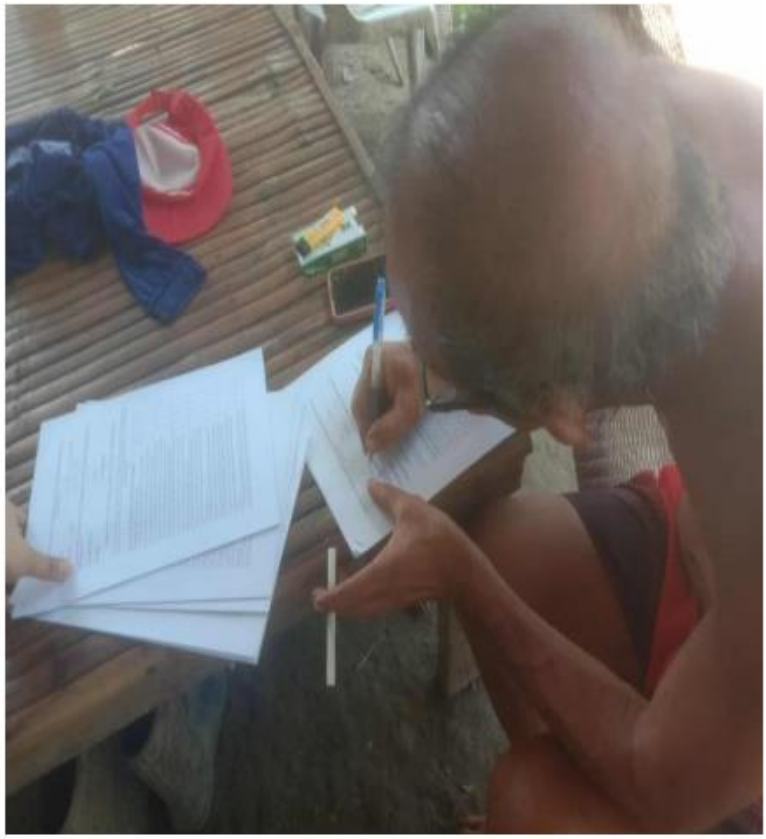
APPENDIX C
DOCUMENTATION



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APPENDIX D
CONSENT LETTERS

Republic of the Philippines
Department of Education
REGION III – CENTRAL LUZON
SCHOOLS DIVISION OFFICE OF NUEVA ECIJA
JULIA ORTIZ LUIS NATIONAL HIGH SCHOOL
BRGY. SAGABA, STO. DOMINGO, NUEVA ECIJA

March 24, 2025

Hon. REYNALDO ALEJO
Barangay Captain
Barangay San Fabian
Sto. Domingo, Nueva Ecija

Dear Hon. Reynaldo,

Good day! We hope this letter finds you doing well. Your dedication and hard work in leading Barangay San Fabian are genuinely appreciated, and it is remarkable how committed you are to the welfare of the community.

We, the undersigned, are **Grade 11 - HUMSS A students** currently enrolled in Practical Research I. As part of our course requirements, we are conducting a research study titled **Agricultural in Transition: Exploring the Impacts of Agricultural Modernization on Local Farmers.**

This study aims to assess the effects of modernization efforts on the livelihoods, productivity, and farming practices of local farmers in our municipality. Specifically, it will explore the perceived benefits, compatibility with traditional methods, challenges in adoption, and overall serviceability of modern farming practices.

To gather relevant data, we will distribute self-administered questionnaires to selected individuals in Barangay San Fabian. The survey will focus on assessing the effects of modernization efforts on the livelihoods, productivity, and farming practices of local farmers in our municipality. within the community. The information collected will be used only for academic purposes and will remain confidential. Participation in the study will be voluntary.

We sincerely appreciate your time and consideration of this request. We look forward to your favorable response.

Thank you very much.

Sincerely,

LANCE VINCENT A. DELA TORRE
NAOMI DESHIREE S. NOTORIO
KATHERINE Q. AGNES

Noted by:

ROMARC B. CORONEL
Practical Research I Teacher

Approved by:

REYNALDO ALEJO
Barangay Captain – Barangay San Fabian, Sto. Domingo, Nueva Ecija

Address: Sagaba, Sto. Domingo, Nueva Ecija
Email: Julia.ortiz1945@gmail.com
Facebook Page: Julia Ortiz Luis National High School 300814

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Republic of the Philippines
Department of Education
REGION III - CENTRAL LUZON
SCHOOLS DIVISION OFFICE OF NUEVA ECIJA
JULIA ORTIZ LUIS NATIONAL HIGH SCHOOL
BRGY. SAGABA, STO. DOMINGO, NUEVA ECIJA

March 24, 2025

Hon. FORTUNADO DC. RAMOS
Barangay Captain
Barangay Cabugao
Sto. Domingo, Nueva Ecija

Dear Hon. Fortunado,

Good day! We hope this letter finds you doing well. Your dedication and hard work in leading Barangay Cabugao are genuinely appreciated, and it is remarkable how committed you are to the welfare of the community.

We, the undersigned, are **Grade 11 - HUMSS A students** currently enrolled in Practical Research I. As part of our course requirements, we are conducting a research study titled **Agricultural in Transition: Exploring the Impacts of Agricultural Modernization on Local Farmers.**

This study aims to assess the effects of modernization efforts on the livelihoods, productivity, and farming practices of local farmers in our municipality. Specifically, it will explore the perceived benefits, compatibility with traditional methods, challenges in adoption, and overall serviceability of modern farming practices.

To gather relevant data, we will distribute self-administered questionnaires to selected individuals in Barangay Cabugao. The survey will focus on assessing the effects of modernization efforts on the livelihoods, productivity, and farming practices of local farmers in our municipality. within the community. The information collected will be used only for academic purposes and will remain confidential. Participation in the study will be voluntary.

We sincerely appreciate your time and consideration of this request. We look forward to your favorable response.

Thank you very much.

Sincerely,

LANCE VINCENT A. DELA TORRE

NAOMI DESHIREE S. NOTORIO

KATHERINE Q. AGNES

Noted by:

ROMARC B. CORONEL
Practical Research I Teacher

Approved by:

FORTUNADO DC. RAMOS
Barangay Captain – Barangay Cabugao, Sto. Domingo, Nueva Ecija

Address: Sagaba, Sto. Domingo, Nueva Ecija
Email: Julia.ortiz1945@gmail.com
Facebook Page: Julia Ortiz Luis National High School 300814

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JULIA ORTIZ LUIS NATIONAL HIGH SCHOOL
BRGY. SAGABA, STO. DOMINGO, NUEVA ECIJA

March 24, 2025

Hon. JOMAR ALEJO
Barangay Captain
Barangay Malaya
Sto. Domingo, Nueva Ecija

Dear Hon. Jomar,

Good day! We hope this letter finds you doing well. Your dedication and hard work in leading Barangay Malaya are genuinely appreciated, and it is remarkable how committed you are to the welfare of the community.

We, the undersigned, are **Grade 11 - HUMSS A students** currently enrolled in Practical Research I. As part of our course requirements, we are conducting a research study titled **Agricultural in Transition: Exploring the Impacts of Agricultural Modernization on Local Farmers.**

This study aims to assess the effects of modernization efforts on the livelihoods, productivity, and farming practices of local farmers in our municipality. Specifically, it will explore the perceived benefits, compatibility with traditional methods, challenges in adoption, and overall serviceability of modern farming practices.

To gather relevant data, we will distribute self-administered questionnaires to selected individuals in Barangay Malaya. The survey will focus on assessing the effects of modernization efforts on the livelihoods, productivity, and farming practices of local farmers in our municipality. within the community. The information collected will be used only for academic purposes and will remain confidential. Participation in the study will be voluntary.

We sincerely appreciate your time and consideration of this request. We look forward to your favorable response.

Thank you very much.

Sincerely,

LANCE VINCENT A. DELA TORRE
NAOMI DESHIREE S. NOTORIO
KATHERINE Q. AGNES

Noted by:

ROMARC B. CORONEL
Practical Research I Teacher

Approved by:

JOMAR ALEJO
Barangay Captain – Barangay Malaya, Sto. Domingo, Nueva Ecija

Address: Sagaba, Sto. Domingo, Nueva Ecija
Email: Julia.ortiz1945@gmail.com
Facebook Page: Julia Ortiz Luis National High School 300814

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JULIA ORTIZ LUIS NATIONAL HIGH SCHOOL
BRGY. SAGABA, STO. DOMINGO, NUEVA ECIJA

March 24, 2025

Hon. JOSE VILLEREAL BESTANTE
Barangay Captain
Barangay Dolores
Sto. Domingo, Nueva Ecija

Dear Hon. Jose,

Good day! We hope this letter finds you doing well. Your dedication and hard work in leading Barangay Dolores are genuinely appreciated, and it is remarkable how committed you are to the welfare of the community.

We, the undersigned, are **Grade 11 - HUMSS A students** currently enrolled in Practical Research I. As part of our course requirements, we are conducting a research study titled **Agricultural in Transition: Exploring the Impacts of Agricultural Modernization on Local Farmers.**

This study aims to assess the effects of modernization efforts on the livelihoods, productivity, and farming practices of local farmers in our municipality. Specifically, it will explore the perceived benefits, compatibility with traditional methods, challenges in adoption, and overall serviceability of modern farming practices.

To gather relevant data, we will distribute self-administered questionnaires to selected individuals in Barangay Dolores. The survey will focus on assessing the effects of modernization efforts on the livelihoods, productivity, and farming practices of local farmers in our municipality. within the community. The information collected will be used only for academic purposes and will remain confidential. Participation in the study will be voluntary.

We sincerely appreciate your time and consideration of this request. We look forward to your favorable response.

Thank you very much.

Sincerely,

LANCE VINCENT A. DELA TORRE
NAOMI DESHIREE S. NOTORIO
KATHERINE Q. AGNES

Noted by:

ROMARC B. CORONEL
Practical Research I Teacher

Approved by:

JOSE VILLEREAL BESTANTE
Barangay Captain – Barangay Dolores, Sto. Domingo, Nueva Ecija

Address: Sagaba, Sto. Domingo, Nueva Ecija
Email: Julia.ortiz1945@gmail.com
Facebook Page: Julia Ortiz Luis National High School 300814

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JULIA ORTIZ LUIS NATIONAL HIGH SCHOOL
BRGY. SAGABA, STO. DOMINGO, NUEVA ECIJA

March 24, 2025

Hon. BARTOLOME R. LLENA
Barangay Captain
Barangay Sagaba
Sto. Domingo, Nueva Ecija

Dear Hon. Bartolome,

Good day! We hope this letter finds you doing well. Your dedication and hard work in leading Barangay Sagaba are genuinely appreciated, and it is remarkable how committed you are to the welfare of the community.

We, the undersigned, are **Grade 11 - HUMSS A students** currently enrolled in Practical Research I. As part of our course requirements, we are conducting a research study titled **Agricultural in Transition: Exploring the Impacts of Agricultural Modernization on Local Farmers.**

This study aims to assess the effects of modernization efforts on the livelihoods, productivity, and farming practices of local farmers in our municipality. Specifically, it will explore the perceived benefits, compatibility with traditional methods, challenges in adoption, and overall serviceability of modern farming practices.

To gather relevant data, we will distribute self-administered questionnaires to selected individuals in Barangay Sagaba. The survey will focus on assessing the effects of modernization efforts on the livelihoods, productivity, and farming practices of local farmers in our municipality. within the community. The information collected will be used only for academic purposes and will remain confidential. Participation in the study will be voluntary.

We sincerely appreciate your time and consideration of this request. We look forward to your favorable response.

Thank you very much.

Sincerely,

LANCE VINCENT A. DELA TORRE

NAOMI DESHIREE S. NOTORIO

KATHERINE Q. AGNES

Noted by:

ROMARC B. CORONEL
Practical Research I Teacher

Approved by:

BARTOLOME R. LLENA
Barangay Captain – Barangay Sagaba , Sto. Domingo, Nueva Ecija

Address: Sagaba, Sto. Domingo, Nueva Ecija
Email: Julia.ortiz1945@gmail.com
Facebook Page: Julia Ortiz Luis National High School 300814