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Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines: A Break-Even Point (BEP) and Profitability Analysis Through Short-Run and Long-Run Cost Function

Alcantara, Joyce Ann[1]; Alejandro, Xyran Aerielle[2]; Alquiroz, Jake Ernan[3]; Ansela, Luz Clarita[4]; Antonio, Mikee[5]; Balanza, Gia Vanessa[6]; Bauat, Jhosalyn[7]; Begino, Maricar[8]; Sitchon, Kristel[9]

[1;2;3;4;5;6;7;8;9]Nueva Ecija University of Science and Technology Cabanatuan City

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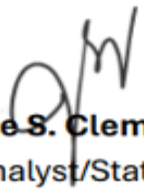
CERTIFICATE OF STATISTICAL DATA INTERPRETATION

This certificate acknowledges that the undersigned has thoroughly analyzed and interpreted the data from the research study titled "**Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines: A Break-Even Point (BEP) and Profitability Analysis through Short-Run and Long-Run Cost Function".** The statistical methods applied ensure the accuracy, reliability, and validity of the findings, contributing to the integrity of the research outcomes.



Jasmine S. Clemente, RPm
Data Analyst/Statistician

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APPROVAL SHEET

This thesis entitled Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines: A Break-Even Point (BEP) and Profitability Analysis Through Short-Run and Long-Run Cost Function, prepared and submitted by Joyce Ann Alcantara, Xyran Aerielle Alejandro, Jake Ernan Alquiroz, Luz Clarita Anselsa, Mikee Antonio, Gia Vanessa Balanza, Jhosalyn Bauat, Maricar Begino, and Kristel Sitchon, in partial fulfillment of the requirements for the degree Master in Business Administration, is hereby recommended for approval and acceptance.

December 2025
Date

MARIETTA J. ABLAZA, Ph.D.
Adviser

Accepted in partial fulfilment of the requirements for Degree Master in Business Administration.

December 2025
Date

JOCELYN B. CRUZ, Ph.D.
Dean

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ABSTRACT

Rice farming plays a crucial role in the Philippine economy, especially in Nueva Ecija, the country's "Rice Granary," yet many farmers continue to struggle financially due to rising input costs, unstable farmgate prices, climate risks, and the effects of the Rice Tariffication Law. This study aims to analyze the income levels of rice paddy farmers in the province by examining their short-run and long-run production costs, determining their break-even points (BEP), and evaluating profitability through financial ratios. Using a mixed-method design, data were gathered from 20 purposively selected farmers across 12 municipalities through a validated questionnaire that captured demographic profiles, farm characteristics, and detailed cost and revenue information. Analysis involved computing average fixed and variable costs, BEP in peso and per kilogram of palay, and profitability indicators such as gross profit margin, net profit margin, ROA, and ROI. Findings suggest that farmers incur high variable costs—particularly fertilizer, labor, and mechanization—which push many smallholders close to the break-even point, making them vulnerable to price fluctuations and input price increases. However, access to mechanization, irrigation, and improved seed varieties appears to lower per-unit production costs and improve profitability in the long run. Overall, the study highlights that while Nueva Ecija remains highly productive, the economic sustainability of rice farmers depends on cost efficiency, access to technology, and supportive government programs. The results emphasize the need for strengthened policy interventions, enhanced financial literacy, and better resource management strategies to help farmers improve income stability and long-term viability.

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CHAPTER ONE
INTRODUCTION

A. The Problem and its Background

Agriculture is a major sector in the Philippine economy, ranking third among sectors in 2025, behind the Services and Industry sectors. The country boasts a total land area of 30 million hectares (Mha). 9.67 Mha of total land area is classified as agricultural land, 4.94 Mha of which is arable. Of the total arable land, 3.2 million hectares (Mha) are irrigable, and approximately 56% of this land was developed into farmland in 2014 (NICCDIES, 2025). The sector primarily produces Filipino food staples such as *palay* or rice and corn, but also focuses other crop produce, including coconut, cavendish bananas, pineapple, mango, sugarcane, and coffee contributing to about 57% of the total production value of the agricultural sector in 2023, as well as livestock, poultry, and fishery products.

According to the Philippine Statistics Authority's (PSA) Agriculture and Fisheries Indicators System 2024, the agriculture, forestry, and fisheries (AFF) sector has steadily increased its annual growth rate and the number of employed persons from 2019 to 2023. The sector averaged 4.7% growth per year and reached its highest employment point in 2023 at 11.19 million. The workforce was majority male, with about two males for every one female employed. This contributed 23.2% of the country's total employment for that year accounting for 9.4% of its total Gross Domestic Product (GDP) (O'Neill, 2025). Furthermore, the incline in AFF employment also led to a 5.5% yearly increase in the average daily basic pay of wage and salaried employees. However, due to constantly rising prices of raw materials and inflation, labor productivity continued to decline in the five-year span, with 2023 valued at Php 161,247.12, which was 2.0% lower than in 2022.

Due to the geographical nature of the Philippines, its agricultural sector is particularly vulnerable to natural disasters and phenomena such as climate change, monsoons, and extreme weather events. In a statistical report released by the PSA, damages incurred due to natural extreme events and disasters amounted to a whopping Php 463 billion from 2010 to 2019. The largest share of these damages, with 62.7% or Php 290 billion, came from the agricultural sector of the country. This amount includes the income forgone due to production losses of 2.9 million tons of rice and 1.02 million tons of corn from 2011 to 2015. The damage and losses brought about by the calamities suppressed the growth of the agriculture sector as mentioned by the Department of Agriculture (DA) in 2015.

Aside from monsoons and typhoons, the country's agricultural sector is also prone to the effects of the El Niño phenomenon. In 2024, the DA recorded a production loss due to the effects of El Niño of more than Php 15 billion, which accounts for total agricultural production loss of more than Php 57 billion from other combined factors such as pests and tropical cyclones, diseases, and volcanic activities affecting more than 1.4 million Filipino farmers.

The Philippines is the 8th largest *palay* producer in the world, accounting for 2.8% of the global rice population. In 2021, the country harvested 4.81 Mha of rice, for a total production of 19.96 million metric tons (MT) valued at Php 403.89 billion. However, even with this level of rice production and the Philippines' self-sufficiency ratio (SSR) for rice at 81.5%, rice remains the most imported agricultural commodity in the Philippines, amounting to 2.98 million MT, valued at Php 56.17 million, accounting for 14.93% of total rice production or 7.26% of all agricultural imports in 2021. While rice exports only amounted to 395.4 MT, valued at Php 29,424, which is .0009% of total agricultural exports for the same year (PSA, 2021).

In a press release by the PSA in April 2025, the 2024 shares per region of the Philippines were highlighted for the value of production in agriculture and fisheries, reaching over Php 1.73 trillion. Among the eighteen (18) regions, Region III - Central Luzon had the highest share at 13.7% for agriculture and fisheries, and the third highest share for crop production at 9.7% just behind Region X - Northern Mindanao and Region II - Cagayan Valley at 12.1% and 10.7% respectively.

Central Luzon occupies the central portion of Luzon and houses the largest contiguous flat lowland area in the Philippines, known as the central plains of Luzon, with a total land area of more than 22,015 square kilometers (sq. km.), producing more than a third of the country's rice supply earning its nickname as the "Rice Granary of the Philippines". It is also where the attached Government-Owned or Controlled Corporation (GOCC) of the DA created through Executive Order (EO) 1061 on November 5, 1985, the Philippine Rice Research Institute (PhilRice) located in Nueva Ecija, whose mandate is to help develop high-yielding and cost-reducing technologies so farmers can produce enough rice for all Filipinos for prosperous rice communities toward sufficient and affordable rice for all. Other DA-attached national headquarters in Nueva Ecija include the Philippine Carabao Center (PCC) whose mandate is focused in promoting the carabao in the live stock industry and Philippine Postharvest Development and Mechanization (PhilMech) mandated to generate, extend, and commercialization mechanization techniques for agriculture and fishery.

The province of Nueva Ecija is home to 127,705 rice farmers with an average age of 60, 83% are males, and the remaining 17% are females. Nueva Ecija farmers alone make up almost half, or 40.27% of the total 317,083 farmers in Central Luzon capable of producing 50.90% or 1.77 MT of annual rice production in all ecosystems in Central Luzon in 2024. Most farmers hold ownership

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of their farm at 74% of the total number of farmers in the province, 14% are tenants, 3% are lessees, 2% are amortizing, and 7% are other cases. Furthermore, the average farm size measures 1.80 hectares. The estimated monthly income of rice-based farming households of five in Nueva Ecija ranks fourth highest in the Philippines, with an average of Php 37,426.00 (Ricelytics, July 2025).

Ricelytics provides readily available annual data for the costs and returns of rice production in the Philippines per region in all ecosystems, including gross profit, production cost, and the average distribution of said production costs. However, these data do not include financial metrics that assess the efficiency, effectiveness, and whether or not the current practices and technologies applied by rice paddy farmers per region are sustainable. By determining financial inputs such as variable costs, fixed costs, assets, etc., the study was able to propose a strategic financial plan outlining the optimal production for rice to guarantee an increase in productivity as well as profitability for creating sustainable rice production systems.

A financial analysis assessment is conducted to analyze the financial health of rice paddy farmers at different income levels in Nueva Ecija by determining the cost and revenue structure of the rice paddy field per farmer, break-even point (BEP) analysis in peso, and per kilo of rice, and profitability ratios taking both the short-run and long-run production. By utilizing the information gathered from this study, stakeholders can assess rice farming efficiency and explore strategies to enhance farm income. Understanding the BEP will aid farmers in identifying the minimum output required to cover costs, allowing them to make informed decisions regarding their operations. Additionally, the profitability analysis will highlight potential areas for improvement and investment, ultimately contributing to the sustainable growth of the rice farming sector in Nueva Ecija.

B. Literature Review

➢ *Rice Farming and Farmers' Income*

In the Philippines, rice is the main staple food and also a major source of income for many families living in rural areas (Casinillo, 2020). Rice farming is also the primary livelihood in many Asian countries, including the Philippines. According to the Philippine Statistics Authority (PSA, 2025), Nueva Ecija is still the top rice producer in the country and plays a big role in the national rice supply. However, studies reveal that despite their contribution, rice farmers often face low income due to rising production costs, unstable market prices, and climate-related risks (Briones, 2019).

Another issue that affects farmers is the Rice Tariffication Law (RTL). This law was made to give Filipinos access to cheaper rice and to control inflation by allowing more supply from other countries.But the side effect is the low price of rice farmer's output which drops their income low while the price of agricultural inputs are increasing through time (Tobias 2019; Casinillo 2020).

➢ *Farm Mechanization and Rice Farming Profitability in the Philippines*

Farm mechanization has been widely recognized as a driver of efficiency and cost reduction in rice farming. In the Philippines, the Department of Agriculture and the Philippine Center for Postharvest Development and Mechanization have emphasized mechanization programs under the Rice Competitiveness Enhancement Fund (RCEF) to address high production costs and labor shortages. According to Bordey, et. al (2016), labor expenses account for the largest share of rice production costs in the Philippines, ranging from 30–40% of total costs. Mechanization can substantially reduce these labor requirements, improving profitability and farmers' break-even positions.

Nueva Ecija, being the "Rice Granary of the Philippines," has been a priority area for RCEF mechanization. The adoption of modern farm machinery has been widely recognized as a crucial factor in enhancing rice production efficiency and profitability. A study by Corpuz et al. (2021) reported that the use of rice transplanters, combine harvesters, and mechanical dryers reduced harvesting losses by up to 3% and cut labor requirements by 20–30%, ultimately leading to higher net income per hectare. These findings underscore the role of machinery not only in short-run cost reduction—through substitution of labor but also in long-run profitability, as efficiency gains accumulate over time.

Similarly, Malanon and Dela Cruz (2022) examined the effects of combine harvester adoption in Luzon, Philippines, and found that mechanization significantly lowered harvesting-threshing losses and production costs. Their study revealed that the use of a Rice Combine Harvester (RCH) reduced losses by an average of 1.02 percentage points, equivalent to PhP 718.40/ha, and lowered harvesting costs by PhP 3,908.60/ha. This efficiency translated to a potential net gain of PhP 4,627/ha per cropping season, directly improving farmers' income levels. The authors conclude that mechanization is both a cost-reducing and income-enhancing strategy, especially in rice-producing provinces such as Nueva Ecija.

Taken together, these studies highlight the economic significance of farm mechanization in rice farming. For the present study on the income levels of rice paddy farmers in Nueva Ecija, such findings are highly relevant since they demonstrate how the adoption of key machinery particularly combine harvesters, mechanical dryers, and rice transplanters can positively influence both the break-even point and long-term profitability. By contextualizing these insights, the proposed research can assess not only the income levels of Nueva Ecija farmers but also the potential role of mechanization in sustaining or improving farm profitability.

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- *Rice Farming in Nueva Ecija and Its Economic Importance*

Rice farming remains a central pillar of the Philippine agricultural economy, with Nueva Ecija recognized as the country's "Rice Granary" due to its high production volume and extensive rice-growing areas. Numerous studies have explored the cost structures and income dynamics of rice farmers in this region, emphasizing the importance of profitability analysis, BEP estimation, and cost function modeling in understanding the financial viability of rice farming. According to Casiwan et al. (2003), the decomposition of rice production and marketing costs in Nueva Ecija reveals that the largest expenses are labor, land rent, fertilizer, and seeds. Their study found that while farmers capture a significant portion of the farmgate value, they often face reduced net income due to high input costs and uneven marketing margins, especially during the wet season when yields and prices decline.

In more recent work, Mendoza (2022) analyzed the differences in farm productivity and profitability between farmer-borrowers and non-borrowers in Nueva Ecija, highlighting that while borrowing may increase access to inputs, it does not always lead to significantly higher profits. This suggests that other factors, such as cost efficiency and market conditions, play more decisive roles in determining income. Meanwhile, Casinillo (2022) modeled profitability under the Rice Tariffication Law, finding that the liberalization of rice imports led to declining farmgate prices, putting downward pressure on profitability even as production costs continued to rise. These findings reinforce the need for in-depth profitability assessments and cost structure analyses, particularly under shifting policy and market environments.

- *Government Agricultural Investments in Central Luzon*

Government Agricultural Investments in Central Luzon Government support has played a vital role in strengthening rice farming in Central Luzon, particularly in provinces like Nueva Ecija. According to a report by the Philippine Information Agency (2024), the Department of Agriculture allocated over ₱9 billion to agricultural programs in the region. Of this, ₱2 billion was earmarked for farm-to-market roads, and ₱249 million was invested in machinery and equipment. These investments have significantly benefited thousands of farmers and cooperatives by improving access to essential infrastructure, irrigation systems, and farming inputs. Better roads have made it easier for farmers to transport their produce, while modern equipment has helped reduce labor costs and increase efficiency in rice production. The report emphasizes that targeted funding and localized implementation are key to maximizing the impact of government programs. When resources are distributed based on the specific needs of farming communities, they not only enhance productivity but also contribute to long-term livelihood sustainability for rice farmers.

- *Determinants of Machinery Adoption*

Adoption of farm machinery among rice farmers is influenced by socio-economic and institutional factors. Villano and Fleming (2006) found that farm size, access to credit, and membership in cooperatives significantly increase the likelihood of mechanization adoption. Similarly, Grist et al. (2019) identified that collective ownership models and shared-service cooperatives improve adoption among smallholder farmers who cannot afford machinery individually.

In Nueva Ecija, Garcia and Marquez (2020) observed that farmers with larger landholdings and those linked to cooperatives or farmer organizations were more likely to adopt mechanization due to economies of scale and easier access to RCEF support programs. This underscores the need for institutional interventions to make mechanization accessible to small and marginal farmers, intending to enhance efficiency, reduce costs, and foster inclusivity in the rice sector.

- *Philippine Rice Supply Demand Prospects and Policy Implications*

Rice continues to be the most important commodity in the Philippines, accounting for about 15% of gross value added in agriculture. It is grown on nearly two-thirds of the country's arable land and is a major source of livelihood for many small farmers and agricultural landless households. Rice also remains to be the main food staple, contributing 35% of the population's total calorie intake on average, and as much as 60-65% of the households in the lowest income quartile. Rice constitutes about 11% of total household expenditure, and double that ratio among the poor households.

Because of the political and economic importance of rice in the country, the rice sector has historically been the central focus of government agricultural policy. Government interventions have been aimed to achieve several, often conflicting, objectives – to stabilize prices, raise farm incomes, provide low prices to consumers, and attain rice self-sufficiency in pursuit of food security.

Over the past three decades, however, the level and nature of these government interventions and the relative importance of policy objectives have changed in response to changes in the domestic rice demand and supply factors, the macroeconomic environment, ant. the political economy forces. Likewise, changes in the world rice and fertilizer markets and technological developments through public and private international research have had equally important impacts on the performance of the Philippine rice economy and in shaping the nature of government interventions.

- *Rice Value Chain Analysis in Nueva Ecija*

Rice farming has long been the backbone of Nueva Ecija's economy, providing both food and livelihood to thousands of families. In their study, Hilado et al. (2023) explored the rice seed production value chain in the province, offering a detailed look into how rice moves from farm to market and the challenges farmers face along the way.

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The researchers found that the rice value chain in Nueva Ecija is still largely traditional, involving multiple layers such as farmers, traders, millers, wholesalers, and retailers. While this structure ensures rice reaches consumers, it also introduces inefficiencies. The presence of brokers, for instance, tends to drive up marketing costs, reducing the income that farmers take home.

One of the key issues highlighted in the study is the high cost of production and marketing. These are driven by factors such as low yields, labor-intensive farming practices, and inadequate infrastructure. As a result, farmers struggle to remain competitive, and rice prices remain high for consumers.

To address these challenges, Hilado and colleagues recommended several practical solutions. These include investing in technologies that can boost yields and reduce postharvest losses, as well as improving infrastructure for milling, drying, transportation, and storage. Such interventions could help farmers cut costs, increase profits, and strengthen the overall rice value chain in Nueva Ecija.

- *Empirical Findings from Nueva Ecija*

Studies in Nueva Ecija show that adopting improved varieties and modern machinery generally increases per-hectare returns and lowers BEP yields compared with traditional practices. However, the benefits are unevenly distributed, as access to capital and CHS determines which farmers capture gains (SCIRP, 2023).

- *Break-Even Point and Cost–Return Studies in Rice Farming*

Break-even point analysis is a fundamental tool in agricultural economics used to determine the output level or price at which a farm's total revenue exactly equals its total cost, resulting in neither profit nor loss. In the context of rice farming, BEP studies typically rely on detailed farm-level cost surveys that separate variable costs, such as labor, seeds, and fertilizer from fixed costs, including machinery and land. By combining these costs with observed crop yields and prevailing farmgate prices, researchers can calculate the BEP yield at current prices, which indicates the quantity of rice (in tonnes per hectare) that must be produced to cover all costs, and the BEP price at current yields, which shows the minimum farmgate price required to break even. Regional evidence, including studies from neighboring countries, demonstrates that BEP analysis is highly useful for evaluating the economic viability of adopting new technologies, mechanization, or integrated crop management practices, as it allows farmers and policymakers to assess whether investments in machinery, improved seed varieties, or other innovations are justified under existing price and yield conditions. In Nueva Ecija and surrounding provinces, recent applied studies have extended BEP analysis by incorporating sensitivity analysis, examining how changes in input prices such as fertilizer or fuel affect farm profitability. These analyses are particularly important in contexts where price fluctuations or policy interventions can significantly influence both production costs and potential income, providing farmers and stakeholders with practical guidance for decision-making and risk management (NASS Publishing, 2022).

- *Theoretical Foundations: Short-Run and Long-Run Cost Functions and Break-Even Point Analysis*

In agricultural economics, cost behavior is typically analyzed through short-run and long-run cost functions. According to Samuelson et al. (2010), the short-run is characterized by the presence of fixed inputs such as land or machinery alongside variable inputs like labor and fertilizer. This results in a cost structure comprising both fixed and variable components. The long-run, in contrast, assumes that all inputs are variable, which allows farmers to alter their production scale and adopt new technologies or capital investments. This framework enables the analysis of cost-efficiency over time, as well as the identification of economies or diseconomies of scale.

Applied to rice farming, these theoretical distinctions help explain how farmers manage input costs under various production constraints. In the short run, limitations in resources may hinder expansion or mechanization, while in the long run, farmers can adjust operations to optimize production costs. The BEP is closely linked to cost function analysis, as it identifies the exact level of output or market price at which total revenue equals total cost, resulting in zero profit. As noted by Kay et al. (2016), the BEP is a crucial planning and decision-making tool, especially in volatile agricultural markets. It helps farmers and policymakers assess how sensitive rice production is to fluctuations in yield, input prices, and market demand, making it essential for ensuring long-term sustainability and resilience in farming operations.

- *Short-Run vs Long-Run Cost Functions in Agricultural Production*

Economic theory in agricultural production distinguishes between short-run and long-run cost behavior, which is essential for understanding how farmers respond to changing prices and input conditions. Short-run cost functions assume that some inputs, such as land or major machinery, are fixed and cannot be immediately adjusted. This framework is particularly useful for analyzing farmers' immediate responses to price shocks or operational decisions, including additional fertilizer application, hiring extra labor, or performing additional land preparation. In contrast, long-run cost functions assume that all inputs are variable, allowing farmers to make strategic decisions regarding farm scale and technology adoption. These decisions may include investing in mechanization, altering the mix of rice varieties planted, or installing irrigation systems, which can significantly influence production efficiency and profitability over time.

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Empirical studies on Philippine rice farming demonstrate that irrigated rice exhibits relatively low price elasticity in both the short and long run. This indicates that farmers do not immediately change the area planted or the quantity produced in response to fluctuations in rice prices. However, long-run elasticities are higher than short-run elasticities, reflecting the gradual adjustments that farmers can make when they have the flexibility to modify all inputs and adopt new technologies. This pattern underscores the importance of considering both short-run and long-run cost behaviors in profitability analyses, as revenue changes may not instantly translate into production changes, but over time, investment in technology and input optimization can substantially affect farm income and economic sustainability (Paedacon, 2023).

- *Research Gaps and Implications for BEP and Short/Long-Run Cost Analysis*

Despite extensive research on rice farm profitability and break-even analysis, several gaps remain that have important implications for BEP and short- versus long-run cost studies. One major limitation is the reliance on cross-sectional data, which provides only a snapshot of costs and revenues at a single point in time. The use of micro-level panel data or before-and-after observations would allow researchers to better separate fixed and variable costs, providing more accurate insights into short-run and long-run cost behaviors and how farmers adjust inputs over time (PSA, 2023). Another important consideration is farm heterogeneity. Differences in farm size, access to CHS, irrigation availability, and varietal choices significantly affect BEP and overall profitability, yet many studies treat farms as relatively homogeneous units. Explicitly accounting for this heterogeneity is crucial for producing realistic and policy-relevant analyses (IJAEMS, 2023). Finally, incorporating policy shock simulations, such as changes in import regulations, buffer stock interventions, or sudden fluctuations in input prices, can provide valuable information on how these external factors influence BEP and farmer incomes. Including such scenario analyses helps policymakers and farmers anticipate risks and make informed decisions under varying market and policy conditions (Reuters, 2022).

- *Determinants of Profitability: Technology, Mechanization, Seeds, Irrigation, and Policy*

Profitability in rice farming is influenced by several interrelated factors that affect both costs and revenues. One key determinant is the adoption of yield-enhancing technologies, including improved seed varieties and better crop management practices, which can increase revenue per hectare and reduce the break-even point yield required to cover costs. Studies in Nueva Ecija indicate that farmers cultivating special-purpose rice varieties generally achieve higher per-hectare incomes compared to those growing traditional varieties (SCIRP, 2023). Mechanization and Custom Hiring Services (CHS) also play a significant role in shaping profitability by affecting both fixed and variable costs. CHS allows smallholder farmers to access machinery and labor services without large upfront investments, lowering per-unit production costs and influencing the BEP by modifying the overall cost structure. Profitability analyses of both CHS providers and adopter farmers highlight the economic returns of mechanization and the importance of scale effects in optimizing production efficiency (UKDR UPLB, 2022). Another critical factor is input price volatility and government policy. Fluctuations in prices of essential inputs, such as fertilizer and fuel, as well as government interventions like tariffs, import regulations, and buffer stock programs, directly affect farmgate prices and production costs. These policy and market shocks are particularly important in BEP sensitivity analyses, as they can substantially impact farmer incomes and the minimum thresholds required for profitable production (Reuters, 2022).

Economic modeling and agricultural finance are essential tools in understanding the financial sustainability of rice farming in the Philippines. According to Taer and Taer (2024), agricultural innovations must be supported by unified systems that enhance profitability and resilience among smallholder farmers. Their study emphasizes the importance of localized financial strategies and institutional support to improve income levels and reduce vulnerability to market fluctuations.

Truelove, Lellyett, Issaka, and Huda (2023) present a theoretical framework for agricultural value chains that integrates economic, natural, and social systems. This model is particularly relevant to rice farming in Nueva Ecija, where financial tools and policy interventions must be tailored to local market dynamics. Their work supports the use of cost-volume-profit (CVP) analysis and break-even modeling to guide farmers in optimizing resource use.

Weerahewa and Jacque (2022) highlight the role of policy analysis tools such as GTAP models, benefit-cost analysis, and linear programming in agricultural decision-making. These tools help quantify short-run and long-run cost functions, enabling farmers to assess profitability and return on investment (ROI). Their findings underscore the need for strategic financial planning to improve farm efficiency and economic resilience in rice-producing regions.

Agricultural finance plays a pivotal role in enabling farmers to invest in inputs, technologies, and infrastructure that enhance productivity. Access to credit, insurance, and financial literacy directly influences the profitability of rice farming enterprises (Weerahewa & Jacque, 2022). In Nueva Ecija, financial interventions such as the Rice Competitiveness Enhancement Fund (RCEF) have shown measurable impacts on farmer income levels, allowing for the adoption of yield-enhancing practices and better financial planning.

Rice farming in the Philippines, particularly in Nueva Ecija, plays a central role in national food security and rural livelihoods. Despite its importance, many smallholder farmers continue to face financial instability due to rising input costs, unpredictable market prices, and limited access to modern technologies. These challenges have prompted researchers and policymakers to explore more precise economic tools to assess farm profitability and guide strategic interventions.

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One of the key indicators of farmer income is the farmgate price, which reflects the amount received by farmers at the point of sale, excluding transportation and marketing costs. Beltran (2024) emphasizes that farmgate prices are highly sensitive to supply-demand dynamics and policy shifts, making them a central variable in income analysis. To understand how farmers can achieve financial sustainability, it is essential to examine both fixed and variable costs. Fixed costs, such as land rent and equipment depreciation, remain constant regardless of output, while variable costs—like seeds, fertilizers, and labor, fluctuate with production volume. These cost components form the basis of short-run and long-run cost functions, which are widely used in agricultural economics to model production behavior and profitability (Economics Discussion, 2023).

Short-run cost functions are useful for analyzing immediate financial constraints, as they assume certain inputs remain fixed. In contrast, long-run cost functions allow all inputs to vary, enabling farmers to plan for efficiency and scale over time. These models are particularly valuable in identifying the break-even point, which determines the minimum output required to cover total costs. Cost-volume-profit analysis is often used alongside these models to evaluate how changes in cost structures and production volumes affect income levels. Sensitivity analysis further enhances this approach by assessing how fluctuations in input prices or yields impact profitability, helping farmers and policymakers anticipate risks and adjust strategies accordingly (Weerahewa & Jacque, 2022).

To measure financial performance, return on investment and other profitability ratios are commonly applied. These indicators provide insights into the efficiency of resource use and the sustainability of farming operations. In rice farming, such metrics are especially useful in comparing income levels across different farm sizes, municipalities, and socioeconomic profiles. Recognizing farm heterogeneity is essential in this context, as differences in resources, practices, and market access can significantly influence financial outcomes (Truelove, Lellyett, Issaka, & Huda, 2023).

Technological advancement has become a key driver of productivity and cost reduction in rice farming. Yield-enhancing technologies, such as hybrid seeds, precision farming tools, and improved irrigation systems, have demonstrated their potential to increase output and profitability. However, input price volatility remains a major barrier to adoption, as farmers may hesitate to invest in innovations without financial stability (Beltran, 2024). Mechanization, including the use of rice transplanters, combine harvesters, and mechanical dryers, has also transformed rice farming by reducing labor dependency and post-harvest losses. These machines are often accessed through custom hiring services, which allow farmers to rent equipment at subsidized rates. Programs like the Rice Competitiveness Enhancement Fund (RCEF) support these services, aiming to improve farm efficiency and competitiveness in regions like Nueva Ecija (RCEF Report, 2023).

Panel data analysis is instrumental in capturing the diversity of farming conditions and tracking changes over time. It enables researchers to simulate policy shocks and forecast the impact of interventions such as subsidies or price controls. These simulations help policymakers anticipate unintended consequences and develop more resilient agricultural strategies (Weerahewa & Jacque, 2022). By integrating cost function modeling, profitability analysis, and technological assessment, researchers can offer actionable insights to improve the financial sustainability of rice paddy farmers. This study contributes to that effort by focusing on Nueva Ecija, providing localized data and analysis that can inform both farmer decision-making and broader agricultural policy.

- *Challenges in Profitability and Marketing of Rice*

Existing literature also emphasizes that profitability in rice farming is often constrained by high input costs, low price stability, and limited access to technology. Studies such as those conducted in other provinces like Masbate. Ibanez et al. (2023) indicate that under rainfed conditions and without irrigation or mechanization, many farmers struggle to generate positive income, often operating near or below the break-even point. Additionally, marketing challenges such as low farmgate prices and exploitative trading systems further diminish the share of profits that accrue to the farmer, as noted in the work of Casiwan et al. (2003) and supported by news reports from Nueva Ecija during the COVID-19 pandemic. These challenges were further amplified during the COVID-19 pandemic, as documented by Rappler (2021), which reported that farmers in Nueva Ecija the country's top rice-producing province, were expecting only to break even due to rising input costs and limited market access during lockdowns. These real-world cases confirm that systemic barriers ranging from input costs and climate risks to marketing inefficiencies continue to undermine the profitability of rice farming in the Philippines. Therefore, addressing these issues through cost and income analysis models, such as BEP and short- to long-run cost functions, is crucial to develop practical solutions that ensure economic sustainability for rice farmers.

- *Rice Importation*

Rice from abroad is cheaper than domestically produced rice. The price gap stems from the difference in the cost of palay production. For instance, Moya et al. (2016) found that palay production in the Philippines costs 90 percent higher than in Vietnam. The Philippines produces palay at PHP 12.41 per kilogram (kg), while Viet Nam's cost is only PHP 6.53 per kg. The root cause of the production cost difference is geography (Dawe 2014). Exporting countries such as India, Thailand, and Viet Nam have wide flat plains watered by large river systems, such as the Ganges, Chao Phraya, Mekong, and Red Rivers, which enable them to produce large surpluses of rice at constant production cost. Meanwhile, relative to population, the Philippines has very limited lands suitable for rice cultivation. As a result, production cost goes up before enough rice is produced to meet domestic demand.

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Rice importation, when not managed carefully, can lead to lower rice prices, reduced revenue for farmers, squeezed profit margins, and disincentives to produce. This can significantly negatively affect the income level of rice paddy farmers. Therefore, we should consider how rice importation policies and actual import volumes affect the price received by farmers in Nueva Ecija, and how that price, in turn, affects their income levels, breakeven points, and overall profitability.

- *Comparative Profitability Analysis of Hybrid and Inbred Rice Farming*

In their 2023 study, Balderas, Lustre, and Narita explored the financial dynamics between hybrid and inbred rice farming in the Bicol Region, an area with agricultural conditions comparable to Nueva Ecija. Their research involved 323 rice farmers, split between 143 hybrid rice growers and 180 inbred rice growers, and used multiple linear regression to examine how different cost components and farm characteristics affect profitability.

The findings revealed a clear trade-off: hybrid rice farming produced higher yields, but it also came with significantly higher production costs, especially for seeds, fertilizers, fuel, and machinery rental. While hybrid rice generated greater overall income, its profit-to-cost ratio was lower than that of inbred rice. This suggests that cost efficiency, not just productivity, plays a crucial role in determining a farm's profitability.

Interestingly, the study found that factors like training attendance, access to credit, and farming experience had little impact on profitability. The only variable that significantly influenced net returns was the type of seed used.

To help farmers improve profitability, the authors recommended several practical strategies; Bulk seed purchasing through cooperatives to reduce input costs. Localized hybrid seed production to improve accessibility and affordability. Machinery-sharing programs to lower equipment expenses. Community-based credit schemes to support small-scale farmers. Training on precision input used to enhance cost-effectiveness.

These recommendations are especially relevant for rice farmers in Nueva Ecija who are considering a shift to higher-value rice varieties or venturing into seed production. By adopting these strategies, farmers can better manage costs, improve returns, and build more resilient farming systems.

- *Economic Viability and Income Analysis of Rice Farmers in Nueva Ecija*

Central Luzon, particularly Nueva Ecija, has consistently shown outstanding agricultural productivity and efficiency. According to the Philippine Statistics Authority (2024), the region achieved the highest net returns from palay production in the country, averaging ₱58,932 per hectare, with a production cost of only ₱11.60/kg, compared to the national average of ₱13.38/kg. These indicators reflect effective cost management and the widespread adoption of irrigation systems, mechanization, and modern production techniques. However, despite these gains, most Nueva Ecija farmers—cultivating an average of 1.5 hectares—earn only around ₱112,500 annually, categorizing them as low-income households (PSA, 2024). This disparity highlights the continued economic vulnerability of smallholder farmers, who remain susceptible to price fluctuations and natural shocks.

The Rice Tariffication Law (RTL), while aimed at stabilizing rice prices and improving competitiveness, has had mixed effects on farmer profitability. Studies indicate that the RTL's liberalization of imports led to a decline in farm-gate prices, reducing local producers' income despite improved productivity from programs under the Rice Competitiveness Enhancement Fund (RCEF) (Briones & Tolin, 2021; Calixto et al., 2023). The resulting increase in domestic supply and continued import competition have created downward pressure on prices, effectively transferring the benefits of efficiency gains to consumers and importers. Moreover, traders and millers capture a larger portion of total profits through faster turnover and higher transaction volumes, while farmers—facing longer production cycles—receive the smallest share of value-added (Tolentino et al., 2022).

These realities underscore the importance of conducting a Break-Even Point (BEP) and Profitability Analysis using short-run and long-run cost functions to determine the economic viability of rice farming in Nueva Ecija. In the short run, farmers' flexibility is limited to adjusting variable inputs such as seeds and labor, while in the long run, technological investments and structural changes can lower production costs (Varian, 2010). By identifying the price and yield levels required to remain profitable, such analysis provides crucial insights into the financial sustainability and resilience of Nueva Ecija's rice farmers amid shifting policy and market conditions.

- *Theoretical Framework*

This study is based on three significant theoretical frameworks, namely the Cost Theory, Break-Even Analysis Theory, and Profit Maximization Theory, to provide insights and integrate key economic concepts in analyzing the income level of rice paddy farmers in Nueva Ecija, Philippines.

The Cost Theory is employed to understand the behavior of production costs in both the short run and long run. In the short run, some inputs are fixed, while in the long run, all inputs become variable. This framework helps analyze how rice farmers manage their resources, adjust input levels, and respond to changes in production scale. By examining fixed and variable costs, the study evaluates how cost structures influence farmers' income and profitability. The short-run cost function reveals immediate constraints

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and operational decisions, while the long-run cost function provides insights into scalability and sustainability of farming practices. Conversely, the Break-Even Analysis Theory focuses on identifying the point at which total revenue equals total cost, meaning no profit or loss is incurred. This framework is crucial for determining the minimum income level required for rice farmers to sustain their operations. By calculating the break-even point, the study assesses the financial viability of rice farming under current market conditions and cost structures. It also helps identify the threshold beyond which profitability begins, guiding farmers in setting production targets and pricing strategies. Another important framework for this study is the Profit Maximization Theory, which posits that producers aim to maximize profits by optimizing input combinations and output levels. This theory supports the analysis of profitability among rice farmers by examining how they allocate resources, respond to market signals, and make strategic decisions to enhance income. The study applies this framework to evaluate the extent to which rice farmers in Nueva Ecija achieve profit maximization, considering constraints such as land size, labor availability, and access to technology.

This paradigm allows for triangulation of findings, enhancing the validity and depth of the analysis.

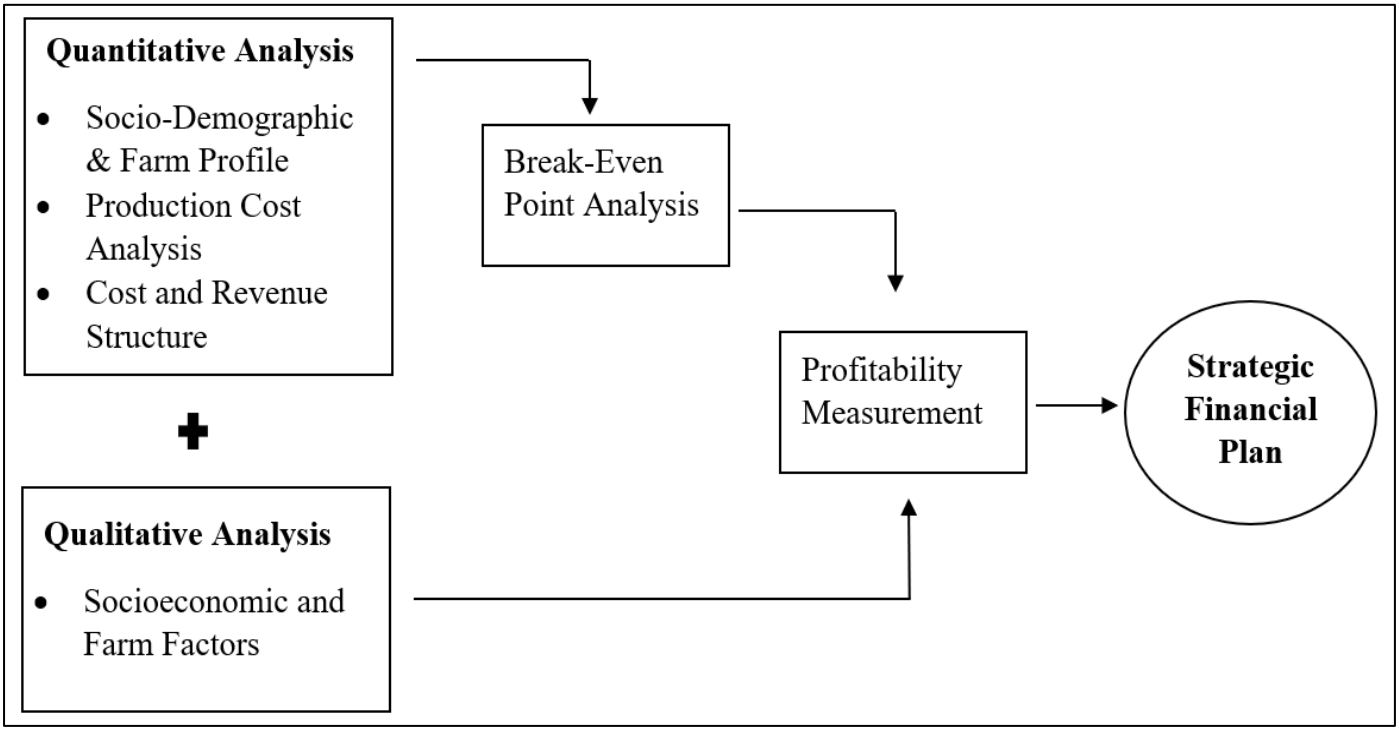

Fig 1 Research Paradigm

➢ *Statement of the Problem*

This study aims to determine and explore the different income levels of rice paddy farmers in Nueva Ecija by analyzing the costs of production, both in the short run and long run, thereby providing a break-even point and profitability analysis to assess their financial sustainability and guide strategies for improving farm efficiency. Specifically, the study will aim to:

- *Describe the Profile of the Rice Paddy Farmer in Terms of:*

✓ Socio-Demographic Characteristics

- Name (Optional)
- Sex
- Age
- Highest Educational Attainment
- Household Size
- Monthly/Seasonal Average Income through Rice Farming
- Number of Years in Operation
- Affiliation or Association to Rice Industry
- Training Attendance
- Government Support Received
- Digital Proficiency

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✓ Farm and Economic Characteristics

- Type of Farm Ownership
- Average Farm Size in Hectares (ha)
- Monthly/Seasonal Average Production in kg

✓ Rice Farming Production Practice

- *Determine the Production Cost in Terms of its:*

✓ Fixed Costs
✓ Variable Costs
✓ Source of Capital

- *Determine the Cost and Revenue Structure of the Rice Paddy Field.*

✓ Revenue
✓ Cost of Goods Sold
✓ Operating Expenses
✓ Interest Expense
✓ Tax Expense

- *Assess the Break-Even Point Analysis for Rice Paddy Farmers in the Context of:*

✓ The Philippine Peso
✓ Per kg of Rice or *Palay*

- *Measure the Profitability of the Current Cost and Revenue Structure of the Farmers Using Financial Profitability Ratios Through:*

✓ Gross Profit Margin
✓ Operating Profit Margin
✓ Net Profit Margin
✓ Return on Assets (ROA)
✓ Return on Investment (ROI)

- *Determine Socioeconomic and Farm-Related Factors and Other Determinants of Income and Profitability.*
- *Propose a Strategic Financial Plan Based on the Results of the Study.*

➢ *Hypotheses*

- *Null Hypothesis (H_0):*

✓ There is no significant relationship between the income level of rice paddy farmers in Nueva Ecija and the short-run and long-run costs incurred in rice farming, leading to an insignificant break-even point (BEP) in peso per kilo of rice and its profitability.

- *Alternative Hypothesis (H_1):*

✓ There is a significant relationship between the income level of rice paddy farmers in Nueva Ecija and the short-run and long-run costs incurred in rice farming, leading to an insignificant break-even point (BEP) in peso per kilo of rice and its profitability.

➢ *Scope, Limitation, and Delimitations*

This study focuses on analyzing the income levels of rice paddy farmers in Nueva Ecija, Philippines, by identifying their break-even point and evaluating profitability through short-run and long-run cost functions. It covers three income categories, *low*, *middle*, and *high*, based on available data. The scope includes profiling farmers' socio-demographic and economic characteristics, assessing their production practices, and examining variable and fixed costs associated with rice farming. The study also incorporates cost-volume-profit analysis, return on investment (ROI), and financial ratio assessments to determine financial sustainability. Data will be gathered using paper-and-pencil survey questionnaires and semi-structured interviews, analyzed through descriptive statistics and economic modeling.

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The study is limited by the availability and accuracy of financial records provided by farmers, which may affect the precision of BEP and profitability calculations. Responses may be influenced by recall bias or reluctance to disclose sensitive financial information, despite assurances of confidentiality. External factors such as weather conditions, market volatility, and policy changes during the study period may also impact the generalizability of findings. Additionally, the study's reliance on self-reported data and its cross-sectional design may not fully capture long-term trends or seasonal variations in income and cost structures.

This research is delimited to rice paddy farmers residing in Nueva Ecija and does not include farmers from other provinces or those engaged in other types of agriculture. It focuses solely on rice production and excludes other income-generating activities such as livestock or vegetable farming. The study is confined to analyzing short-run and long-run cost functions and does not explore macroeconomic factors or international trade dynamics. Only farmers who voluntarily participate and provide informed consent will be included, and the study will observe strict adherence to Republic Act 10173 or the Data Privacy Act of 2012 to ensure ethical handling of personal and financial data.

➢ *Significance of the Study*

This findings of the study will rebound to the benefit of the society, rice paddy farmers, policy makers and agricultural institutions, the academe, stakeholders, and for the future researchers, considering the urgency of rice farming break-even point and profitability analysis but also other significant factors affecting accustomed practices in financial institutions.

To the Rice Paddy Farmers in Nueva Ecija. The findings will provide practical insights into their break-even point , cost structures, and profitability levels, empowering them to make informed financial decisions and optimize resource use. By analyzing short-run and long-run cost functions, the study offers a strategic framework for improving farm efficiency and income sustainability across different income levels.

To the Policymakers and Agricultural Institutions. The research serves as a data-driven foundation for designing support programs, subsidies, and training initiatives tailored to the needs of smallholder farmers. It contributes to national food security efforts by enhancing the economic resilience of the country's rice granary. Academically, the study enriches the literature on agricultural economics and cost modeling, offering a localized perspective that can inform future research and development strategies.

To the Nueva Ecija University of Science and Technology (NEUST). Through this research study, as an institution of higher learning committed to providing exceptional service and quality education, Nueva Ecija University of Science and Technology and other institutes may consider conducting the study widening the scope whilst reducing the limitations of the study.

To the NEUST-Graduate School (GS). The findings can serve as a basis for future decisions particularly in terms of serving the purpose of practicum programs to further uphold their goals and objectives upon their students.

To the Stakeholders. Stakeholders such as other farmers, customers, employees, and community members may gain insights into analyzing the profitability of farmers' current practices and inputs can effectively address their needs, helping them make informed decisions on tackling the most efficient way in rice production.

To the Future Researchers. Future researchers may use this study's findings as a foundation for further investigation into the profitability of different income levels of rice paddy farmers in the agricultural sector of the Philippines, potentially exploring new areas of impact and effectiveness. The study will also help them uncover critical areas that many researchers were not able to explore. Thus, a theory regarding the topic may be arrived at.

➢ *Definition of Terms*

To facilitate better understanding, the following key terms were defined conceptually and/or operationally:

- Agriculture. It is the practice of cultivating the soil, planting, raising, and harvesting both food and non-food crops, as well as livestock production. In this study, agriculture refers specifically to rice farming activities in Nueva Ecija, including land preparation, planting, harvesting, and post-harvest operations.
- Amortizing. In this study, amortizing refers to the process of owning farms subject to scheduled payments made by farmer-beneficiaries through government programs for land acquisition.
- Arable. Refers to areas fit for or used for the growing of crops. In this study, arable pertains to irrigated and cultivable lands in the Philippines used by farmers for rice production.
- BEP Price. The minimum farmgate price per kilogram of rice required to cover total production costs at a given yield level. It indicates the price threshold below which farmers would incur losses and is used to evaluate market risks and pricing strategies.
- BEP Yield. The quantity of rice (typically measured in metric tons per hectare) that must be harvested to reach the break-even point at prevailing market prices. It reflects the minimum yield needed to cover all fixed and variable costs associated with production.

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- Break-Even Point (BEP). he production level at which total revenue equals total cost, resulting in zero profit or loss. It is a critical financial metric used to determine the minimum output or income required for a farming operation to remain viable. In rice farming, BEP helps farmers assess whether their current practices and input levels are financially sustainable.
- Combine Harvester. A machine that performs reaping, threshing, and winnowing in one operation, significantly reducing harvest time and labor requirements.
- Custom Hiring Services (CHS). A system that allows farmers to rent agricultural machinery and equipment rather than owning them, reducing capital costs and improving access to mechanization.
- Economic Viability. The capacity of a farming enterprise to maintain profitable and sustainable operations over time.
- El Niño. Refers to a natural climate pattern characterized by unusually warm ocean temperatures in the eastern Pacific, which disrupts global weather patterns, leading to dry spells and droughts in the Philippines.
- Employed. Include all those who, during the reference period are 15 years old and over as of their last birthday and are reported either at work or with a job but not at work. In this study, it refers to the number of gainfully employed persons in agriculture through rice farming.
- Export. Is a good produced in one country that is sold into another country or a service provided in one country for a national or resident of another country. In this study, export refers to rice produced in the Philippines that is sold and shipped abroad, potentially affecting local supply and pricing.
- Farm Heterogeneity. The variation among farms in terms of size, resources, practices, and income levels. Recognizing this diversity is essential for accurate analysis and policy design.
- Farmgate Price. The price received by farmers for their produce at the point of origin, excluding transportation, marketing, and other post-harvest costs. It reflects the direct income from production and is a key indicator of profitability.
- Fixed Cost/Input. Costs that remain constant regardless of output level, including land rent, equipment depreciation, and loan interest. These must be paid even when production is low or halted.
- Government-Owned or Controlled Corporation (GOCC). Is a state-owned enterprise that conducts both commercial and non-commercial activity. In this study, GOCC pertains to PhilRice that is directly involved in rice technologies, rice production, pricing, and farmer support programs.
- Gross Domestic Product (GDP). Is a monetary measure of the total market value of all the final goods and services produced and rendered in a specific time period by a country or countries. In this study, GDP is used as a reference indicator of the contribution of rice production to the overall Philippine economy.
- Import. Is the activity within international trade which involves buying and receiving goods and services produced in another country. In this study, import refers to rice purchased from other countries that competes with locally produced rice in the Philippine market.
- Input Price Volatility. The fluctuation in prices of essential agricultural inputs like fertilizer, fuel, and seeds. It affects farm planning, profitability, and risk exposure.
- Labor Productivity. Is the measurement by the ratio of rice output to the number of farm workers involved in farming activities.
- Lessees. In this study, lessees refer to rice farmers who rent agricultural land in Nueva Ecija for cultivation under formal or informal lease agreements.
- Long-run Cost Function. A cost model where all inputs are variable, allowing farmers to adjust production scale and adopt new technologies. It is used to evaluate cost-efficiency and profitability over extended periods.
- Mechanical Dryer. A post-harvest machine used to dry rice grains quickly and uniformly, minimizing losses and improving grain quality.
- Mechanization. The use of machines in farming operations to improve efficiency, reduce labor dependency, and enhance productivity. Examples include rice transplanters, combine harvesters, and mechanical dryers.
- Net Farm Income. Refers to the residual income obtained after deducting total production costs from total revenue. It reflects the economic welfare of farmers and their ability to sustain agricultural operations.
- Panel Data. A dataset that combines cross-sectional and time-series information, allowing researchers to track changes over time across multiple farms or regions.
- Policy Shock Simulations. Analytical models that estimate the impact of sudden policy changes (e.g., tariff adjustments, subsidy removal) on farm income, production decisions, and market behavior.
- Price Elasticity. A measure of how responsive the quantity of rice produced or demanded is to changes in price. It indicates the sensitivity of farmers or consumers to market fluctuations.
- Profitability Analysis. A financial assessment used to determine the ability of a business or enterprise to generate income relative to its costs.
- Profitability Ratios. Are used to assess a business's ability to generate earnings over time relative to its revenue, operating costs, balance sheet assets, or shareholders' equity. In this study, profitability ratios refer to the financial indicators used to measure the ability of rice paddy farmers in Nueva Ecija to generate income relative to their production costs and investments.
- Purposive Sampling Method. refers to a group of non-probability sampling techniques in which units are selected because they have characteristics that you need in your sample. In other words, units are selected “on purpose” in purposive sampling.
- Rice Competitiveness Enhancement Fund (RCEF). A government program under the Rice Tariffication Law that provides funding for mechanization, seed development, and farmer training to improve the competitiveness of the rice sector.

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- Rice Transplanter. A machine used to plant rice seedlings uniformly and efficiently, reducing labor costs and improving crop establishment.
- Self-Sufficency Ratio (SSR). It indicates the extent to which a country relies on its own production resource. In this study, SSR refers to the percentage of national rice demand that is met through local rice production in the Philippines.
- Sensitivity Analysis. A method used to determine how changes in input variables (e.g., fertilizer cost, labor rate) affect the outcome of financial models such as profitability or break-even point. It helps assess risk and decision-making under uncertainty.
- Short-run Cost Function. A cost model in which at least one input (e.g., land or machinery) is fixed. It is used to analyze production costs and efficiency over a limited time horizon, typically within a single cropping season.
- Tenants. In this study, tenants refer to farmers in Nueva Ecija who cultivate land owned by another person under a sharecropping or tenancy arrangement.
- Variable Cost/Input. Costs that change with the level of output, such as seeds, fertilizers, fuel, and hired labor. These are directly tied to production volume and are avoidable if production ceases.
- Yield-Enhancing Technologies. Innovations such as hybrid seeds, precision farming tools, and improved irrigation systems that increase crop productivity and reduce per-unit production costs.

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CHAPTER TWO
RESEARCH METHODOLOGY

This chapter presents the research design, locale of the study, respondents, sample and sampling procedure, research instruments, data gathering procedures, data analysis techniques and ethical concerns to describe, assess, and analyze the income level of rice paddy farmers through break-even point and profitability analysis in Nueva Ecija.

- *Research Design*

This study adopts a mixed-method research design with a specific focus on profitability ratio analysis to assess the financial performance of rice paddy farmers in Nueva Ecija. The approach is grounded in agricultural finance and economic modeling, aiming to quantify the efficiency, sustainability, and income-generating capacity of rice farming operations.

Profitability ratios are used to evaluate the relationship between costs and revenues, providing insights into how effectively farmers convert inputs into financial returns. Key ratios to be analyzed include: *Net Profit Margin* that measures the percentage of revenue that remains as profit after all expenses. *Gross Profit Ratio* that evaluates the proportion of revenue remaining after deducting production costs. *Operating Profit Ratio* that indicates the profitability from core farming operations before interest and taxes. *Return on Investment* ratios such as return on asset and return on equity that assesses the gain or loss generated relative to the cost of investment.

These financial metrics will be computed using farm-level data on production costs, yields, farmgate prices, and income. The analysis will be conducted across different income brackets, farm sizes, and ownership types to capture heterogeneity among rice paddy farmers.

By focusing on profitability ratios, the study aims to identify patterns of financial performance, highlight areas for improvement, and propose strategic interventions that can enhance farm income and long-term viability. This method provides a robust framework for understanding the economic realities of rice farming and supports evidence-based policymaking for agricultural development.

- *Locale of the Study*

This study will be conducted in the province of Nueva Ecija, located in Region III, Central Luzon, Philippines. Known as the "Rice Granary of the Philippines," Nueva Ecija is the country's leading rice-producing province, contributing over 50% of Central Luzon's total rice output. It is home to approximately 127,705 rice farmers, most of whom operate small to medium-sized farms averaging 1.80 hectares in size.

Nueva Ecija was selected as the study site due to its strategic importance in national rice production, the presence of key agricultural institutions such as PhilRice, PhilMech, and the Philippine Carabao Center, and its diverse farming practices across irrigated and rainfed ecosystems. The province also benefits from mechanization programs under the Rice Competitiveness Enhancement Fund (RCEF), making it an ideal setting for analyzing profitability ratios and financial sustainability in rice farming.

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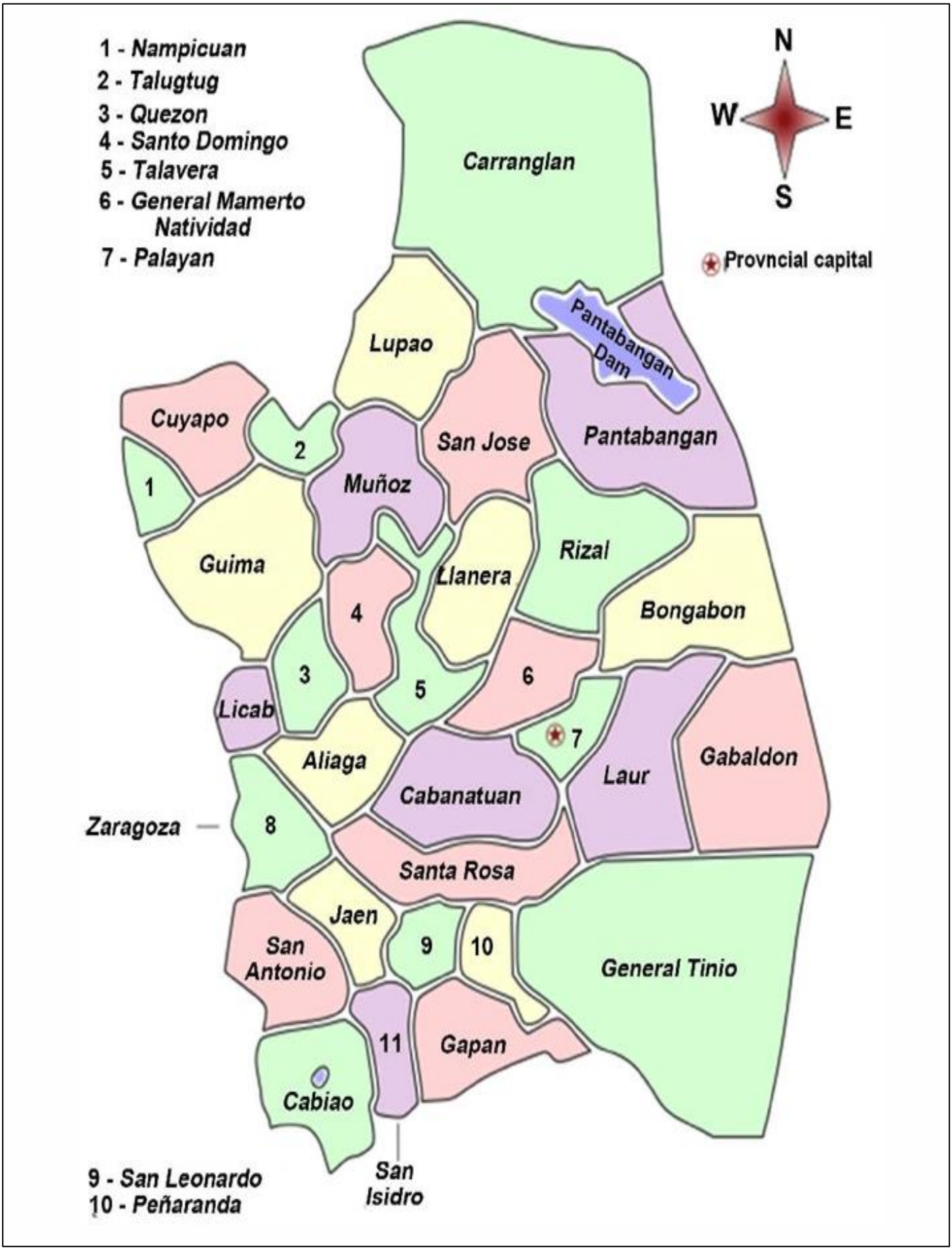

Fig 2 Map of the Nueva Ecija, Philippines

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The study will focus on selected municipalities within Nueva Ecija to capture variations in income levels, access to technology, and cost structures among rice paddy farmers. This localized approach ensures that the findings are contextually relevant and can inform targeted interventions for improving farm profitability and resilience.

- *Respondents*

The respondents of the study are rice paddy farmers located in various municipalities of Nueva Ecija, Philippines. These individuals are directly involved in rice cultivation and production activities, providing first hand data crucial for understanding the cost structure, income levels, and profitability of rice farming in the region.

Nueva Ecija farmers vary in terms of landholding size, years of farming experience, educational background, access to farming technologies, and sources of capital. This diversity allows the study to gather a comprehensive understanding of the economic realities faced by farmers under different operating conditions.

The respondents were purposely selected based on their active involvement in rice paddy farming during the most recent cropping season. These farmers have knowledge and experience of both short-run and long-run cost components involved in rice production, enabling them to provide valuable insights for BEP analysis and profitability assessment.

They represent several municipalities known for high rice production, including Cabanatuan City, San Jose City, Talavera, Guimba, and Rizal. Farmers were categorized based on operational scale (small-scale, medium-scale, and large-scale farmers), farming method (manual vs. mechanized), and whether they own or lease their land. Smallholder farmers, who constitute a majority of the respondents, typically manage less than 2 hectares of land. Their feedback is critical in understanding the income challenges they face, particularly in relation to rising input costs and fluctuating market prices. Medium to large-scale farmers, on the other hand, often benefit from economies of scale, and their input is valuable in identifying factors that contribute to higher profitability margins and lower average costs over time. Some farmers practice multiple cropping or integrated farming systems, incorporating livestock or other crops alongside rice farming. These practices can affect their overall income levels and cost structure, and thus are relevant to both the short-run and long-run cost function analysis.

The educational level of respondents ranges from elementary to college graduates, and many are members of local farmer cooperatives or associations, such as the Nueva Ecija Rice Farmers Association, which support collective marketing, purchasing of farm inputs, and technical assistance.

The experience levels of the respondents range from newly established farmers with 1–3 years of experience to seasoned rice farmers with over 20 years of continuous rice cultivation. This variation ensures that both modern and traditional farming perspectives are incorporated into the analysis

Table 1 Distribution of the Respondents by Municipality

Municipality	**Frequency**	**Percentage**
Cabanatuan City	1	5.00%
San Jose City	3	15.00%
Talavera	2	10.00%
San Leonardo	1	5.00%
Llanera	3	15.00%
Aliaga	2	10.00%
San Antonio	2	10.00%
Munoz	1	5.00%
Gabaldon	1	5.00%
Quezon	2	10.00%
Gen Tinio	1	5.00%
Jaen	1	5.00%
Total	**20**	**100%**

The sample size consisted of 20 rice paddy farmers from five key municipalities in Nueva Ecija. The largest group came from San Jose City (15.00%) and Llanera (15%), followed by Talavera (10.00%), Aliaga (10.00%), San Antonio (10.00%), and Quezon (10.00%). The least group came from Cabanatuan City, San Leonardo, Munoz, Gabaldon, Gen. Tinio and Jaen with the percentage of 5.00%.

This strategic distribution ensures a balanced representation of geographical and socio-economic diversity among rice farmers in the province. It supports a holistic assessment of income patterns, production costs, break-even points, and profitability metrics in the short and long run.

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The study leverages these data points to determine how varying farm practices and scales of operation affect income and cost behavior, providing meaningful recommendations for policy formulation, farm-level decision-making, and sustainable rice production practices.

The study employed a *purposive sampling method* to select rice paddy farmer respondents in the province of Nueva Ecija, Philippines. This non-probability sampling technique was chosen because it allows the researcher to intentionally select individuals who are most knowledgeable and experienced in rice farming, thereby ensuring the relevance and reliability of the data collected for Break-Even Point (BEP) and profitability analysis.

The selection process involved coordination with local agricultural offices, municipal agricultural technologists, and farmers' cooperatives and associations within Nueva Ecija. These organizations assisted in identifying eligible participants who matched the study's inclusion criteria. A total of 20 farmers were interviewed and surveyed from twelve municipalities: Cabanatuan City, San Jose City, Talavera, San Leonardo, Llanera, Aliaga, San Antonio, Munoz, Gabaldon, Quezon, Gen. Tinio and Jaen. The chosen sample size is considered adequate for the qualitative and quantitative analysis of cost structures and income levels, especially given the depth of data collection required for BEP and cost function analysis.

This sampling method ensures that data gathered are context specific and reflective of the actual production conditions in the province. It also enhances the validity of conclusions drawn regarding the short-run and long-run cost behaviors and the financial sustainability of rice farming operations in Nueva Ecija.

- *Research Instruments*

The main data-gathering tool used in this study is a structured survey questionnaire designed to collect quantitative data from rice paddy farmers in Nueva Ecija. The questionnaire, titled "Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines: A Break-Even Point (BEP) and Profitability Analysis through Short-Run and Long-Run Cost Function," is developed by the researcher to obtain information relevant to the objectives of the study. It consists of three main parts.

Part I gathers personal and demographic information such as sex, age, educational attainment, household size, monthly income, and years of operation. It also includes questions about training attendance, government support, and digital proficiency. Part II focuses on farm-related characteristics, including type of farm ownership, farm size, production output, and type of rice farming practice. Part III collects financial data on production costs, both fixed and variable, and the sources of capital used in farming. The instrument includes both closed-ended questions for easy quantification and open-ended items for additional insights.

The questionnaire is written in both English and Filipino to ensure better understanding among respondents. It is validated by experts in business research before distribution. This tool serves as the primary source of data for analyzing the farmers' income levels, break-even points, and profitability ratios, which are essential in assessing the financial sustainability of rice paddy farming in Nueva Ecija.

- *Data Gathering Procedure*

To develop a comprehensive data gathering procedure for the study on analyzing the income level of rice paddy farmers in Nueva Ecija, Philippines through BEP and profitability analysis using short-run and long-run cost functions, it is important to adopt a systematic approach that ensures the collection of accurate, relevant, and actionable data. This procedure aims to assess the financial viability and economic conditions of rice paddy farming in the region, identifying cost structures, income levels, and break-even thresholds that influence both short-term sustainability and long-term profitability.

Upon approval of the research instrument by the academic adviser, formal permission was sought from the Municipal Agricultural Office (MAO) and local farming cooperatives in selected municipalities within Nueva Ecija. After obtaining the necessary approvals, the researcher proceeded to conduct in-person surveys with purposely selected rice paddy farmers who have been actively engaged in farming operations for at least the past three cropping seasons.

A structured survey questionnaire served as the primary data collection tool. It was administered face-to-face with the target respondents to ensure clarity of questions, accurate interpretation of responses, and to allow real-time clarification of any ambiguities. The questionnaire focused on gathering detailed information about production costs (fixed and variable), selling prices, yield per hectare, income levels, and other socio-economic indicators necessary for cost and profitability analysis.

In addition to the survey, the study incorporated a thorough review and evaluation of relevant agricultural and economic documents, including farm input receipts, production records, and government reports from the DA and PSA. These secondary sources provided valuable context and served to validate and complement the primary data collected.

The data gathering process was organized into two critical phases: collection and interpretation. In the first and second phases, the researcher used a standardized checklist embedded within the questionnaire to capture quantitative and qualitative data from respondents. This ensured consistency in responses and a structured basis for later analysis.

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In the third phase, the researcher synthesized and interpreted the data through descriptive and inferential statistical tools. This involved the production cost, financial viability, determining break-even points, and analyzing profitability margins using short-run and long-run cost functions. Patterns and relationships within the data were identified to uncover the economic realities faced by rice paddy farmers in the region.

The results of the data interpretation were presented using descriptive formats, including tables, graphs, and charts. These visual representations enhanced the clarity and accessibility of the findings, facilitating a deeper understanding of the trends and implications observed. This methodical approach to data gathering and analysis ensured a reliable and insightful examination of the research objectives.

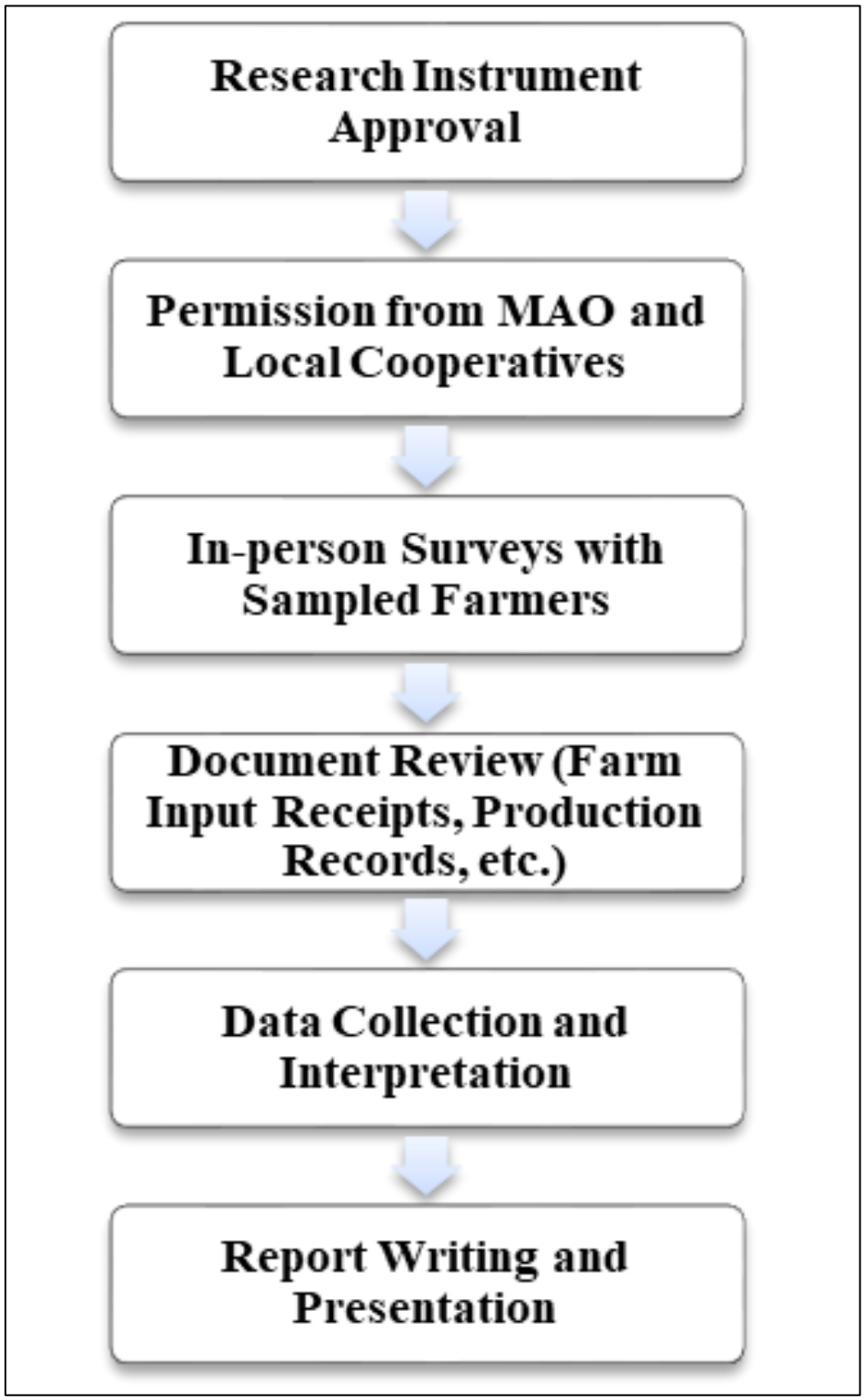

Fig 3 Flowchart of the Data Gathering Procedure

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➢ *Data Analysis Technique*

In determining the production cost in terms of the respondents' rice paddy fields' fixed costs and variable costs, mean or averaging was used, where the sum of all values is divided by the total count of values. After which, said mean values are used to assess the BEP or the CVP analysis for the average rice paddy farmer of Nueva Ecija in terms of the Philippine peso and per kilo of rice or Palay. The CVP or BEP analysis formula used for the study is shown below:

$$\textbf{BEP in Units} = \frac{\textit{Fixed Cost}}{\textit{Contribution Margin per Unit}}$$

$$\textbf{Contribution Margin} = \textit{Price per Unit} - \textit{Variable Cost per Unit}$$

$$\textbf{BEP in Sales Pesos} = \frac{\textit{Fixed Cost}}{\textit{Contribution Margin Ratio}}$$

$$\textbf{Contribution Margin Ratio} = \frac{\textit{Total Revenue} - \textit{Total Variable Cost}}{\textit{Total Revenue}} \; x \; 100$$

In assessing the profitability of the farmers' current cost and revenue structure, a series of financial profitability ratios are calculated using key financial data such as revenue, cost of goods sold (COGS), operating expenses, net income, assets, and equity. To determine these ratios, mean or averaging of respondents' responses is also applied to determine the financial profitability ratios including, gross profit margin, operating profit margin, net profit margin, return on assets, return on equity.

$$\textbf{Gross Profit Margin} = \frac{\textit{Total Revenue} - \textit{Cost of Goods Sold}}{\textit{Total Revenue}} \; x \; 100$$

$$\textbf{Operating Profit Margin} = \frac{\textit{Operating Profit/EBIT}}{\textit{Total Revenue}} \; x \; 100$$

$$\textbf{Net Profit Margin} = \frac{\textit{Net Income/Loss}}{\textit{Total Revenue}} \; x \; 100$$

$$\textbf{Return on Assets} = \frac{\textit{Net Income}}{\textit{Average Total Assets}} \; x \; 100$$

➢ *Ethical Concerns*

The main ethical issue in the research is the potential breach of the respondents' right to privacy, specifically regarding the requested data regarding their demographic profile, as well as the disclosure of their rice farming practices, the rice paddy itself, and its corresponding cost and revenue structure, and other relevant records that the respondents might consider confidential information. This applies especially to financial information such as asset value, variable costs, average income through farming, etc., for fear that such information could be misused, misinterpreted, or disclosed to parties outside the research. This invasion of privacy could cause discomfort or social distress, particularly in a community setting where income levels and farm productivity are sensitive matters.

To address these ethical concerns on the respondents' right to privacy, first, pilot testing and data gathering took place only after the approval of the research principal for the subject. Second, the content and validity testing of the questionnaire were evaluated by three experts to ensure that the questionnaire is viable for the study and understandable for the chosen respondents. Third, the informed consent form was either explained by the researchers in an understandable language to eliminate the language barrier or read to the respondents, followed by securing informed consent from all respondents. Furthermore, the consent form and questionnaire include Tagalog translations to ensure respondents understand the material. Respondents were also informed that participating in the research process might lead them to disclose information they would otherwise prefer to keep private. However, they were assured that their identities would remain anonymous and that all information provided would be treated with the utmost confidentiality, to be used solely for the purposes of this research.

This study upholds strict ethical standards to ensure the protection, dignity, and rights of all participants. Ethical approval was obtained prior to data collection, and informed consent was secured from all respondents, who were made fully aware of their voluntary participation, the confidentiality of their responses, and their right to withdraw at any time without consequence. To further strengthen the ethical foundation of this research, established ethical guidelines such as those outlined by the American Psychological Association (APA, 2020) and the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979) were followed. All sources and references used throughout the study were properly cited to maintain academic integrity and to ensure transparency in both methodology and analysis.

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CHAPTER THREE
RESULTS AND DISCUSSION

This chapter presents the findings obtained from the primary instrument used in the income level of rice paddy farmers through break-even point and profitability analysis in Nueva Ecija. The responses were organized, quantified, and interpreted using different statistical tools. The presentation observed the sequence of the specific problems formulated in this study.

➢ *Presentation*

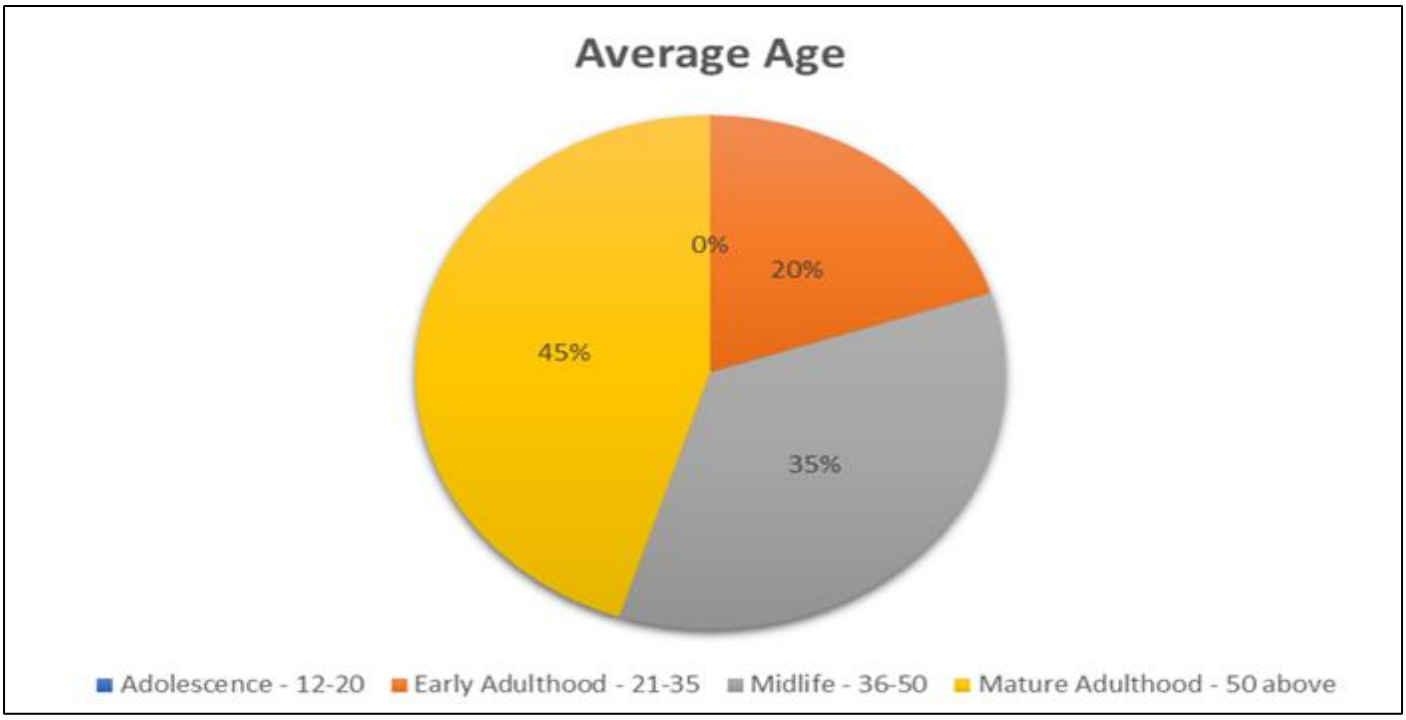

Fig 4 Average Age of Rice Paddy Farmers Sample in Nueva Ecija

The findings show that the rice paddy farmers surveyed in Nueva Ecija are predominantly in mature adulthood, which represents the highest proportion at 45% (9). In contrast, the lowest proportion is adolescence at 0%, with no respondents belonging to this age group. The remaining participants are in midlife at 35% (7) and early adulthood at 20% (4). The average age according to Ricelytics for the year 2022 in Nueva Ecija is 60 years old.

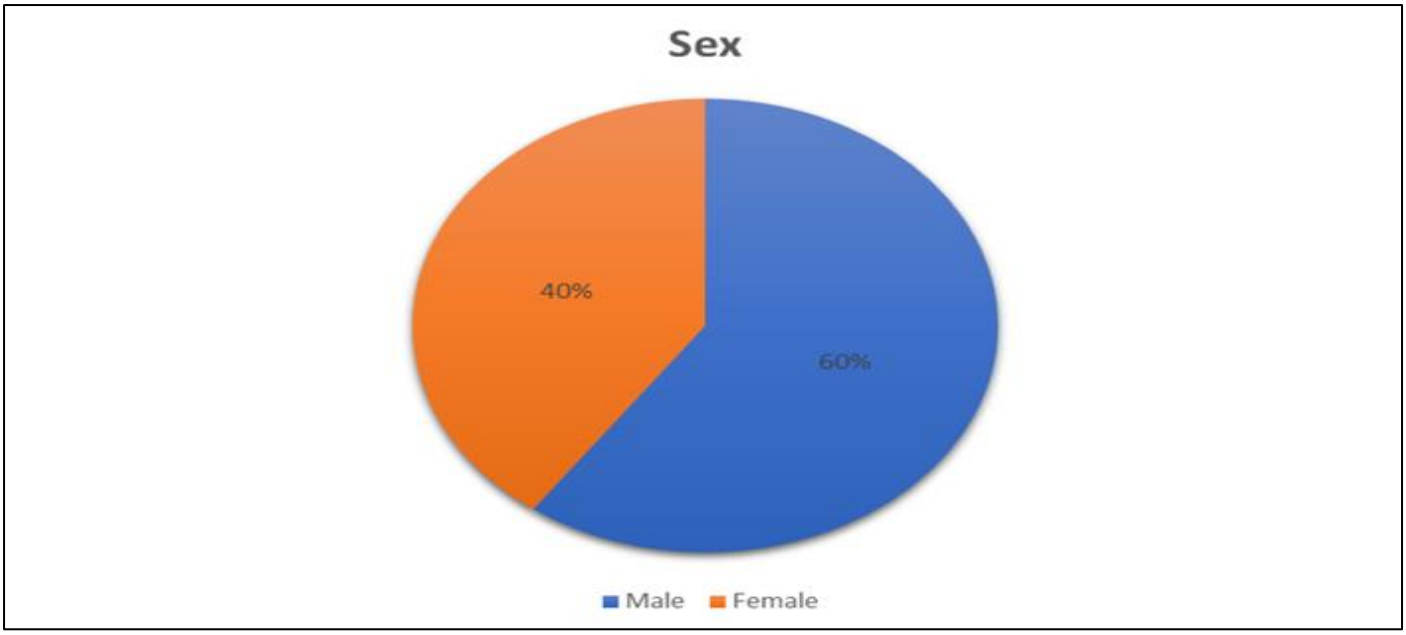

Fig 5 Sex of Rice Paddy Farmers Sample in Nueva Ecija

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The findings indicate that males constitute the higher proportion of respondents at 60% (12), while females represent the lower proportion at 40% (8). Sex distribution according to Ricelytics for the year 2022 in Nueva Ecija is 83% male and 17% female.

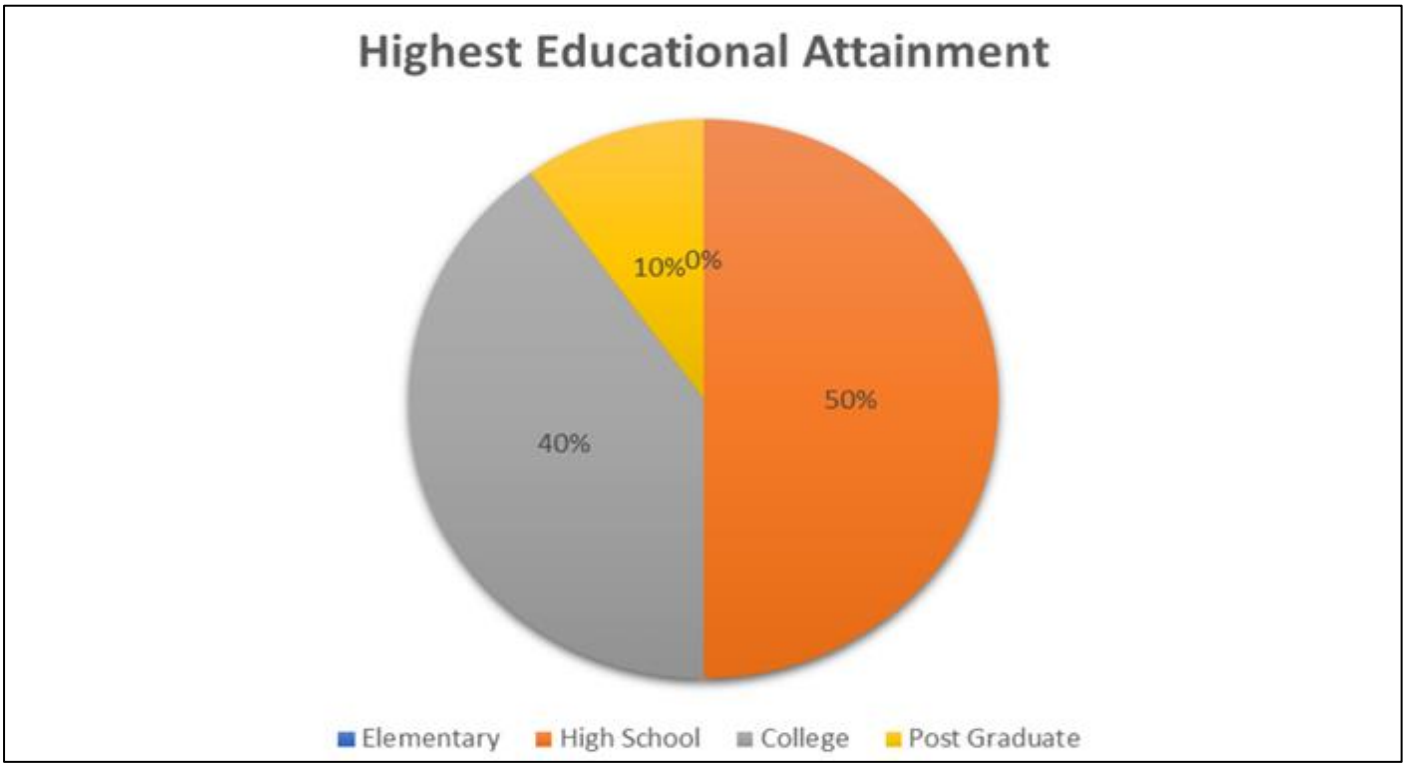

Fig 6 Highest Educational Attainment of Rice Paddy Farmers Sample in Nueva Ecija

The findings show that the highest educational attainment is high school, comprising 50% (10) of the respondents. This is followed by college at 40% (8) and post-graduate studies at 10% (2). The lowest proportion is elementary education at 0% (0), with no respondents in this category. Educational attainment according to Ricelytics for year 2022 in Nueva Ecija show that 9% did not receive any formal education, 40% finished elementary, 42% finished high school and 9% finished college.

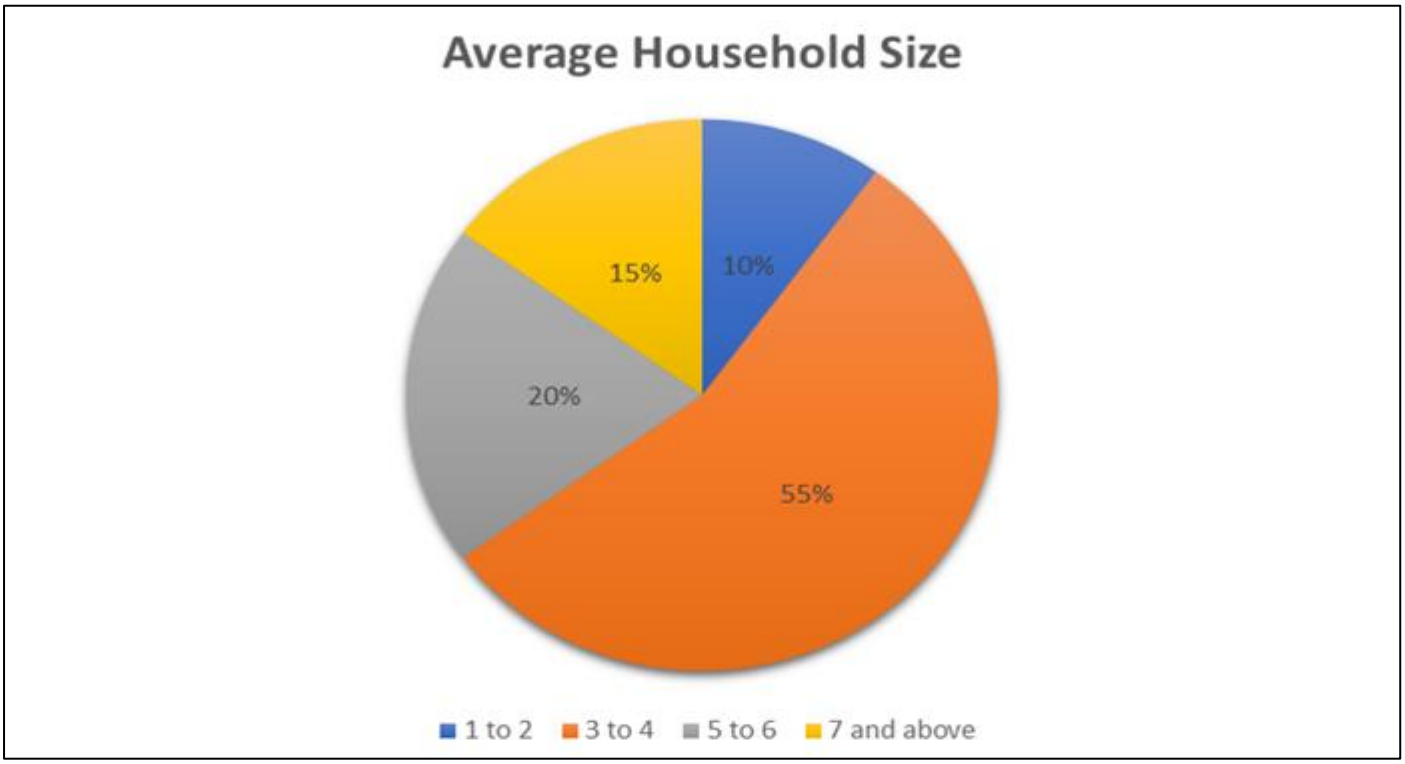

Fig 7 Average Household Size of Rice Paddy Farmers Sample in Nueva Ecija

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The findings indicate that the largest household size category is 3 to 4 members, comprising 55% (11) of the respondents. This is followed by 5 to 6 members at 20% (4) and 7 and above at 15% (3). The smallest proportion is households with 1 to 2 members at 10% (2).

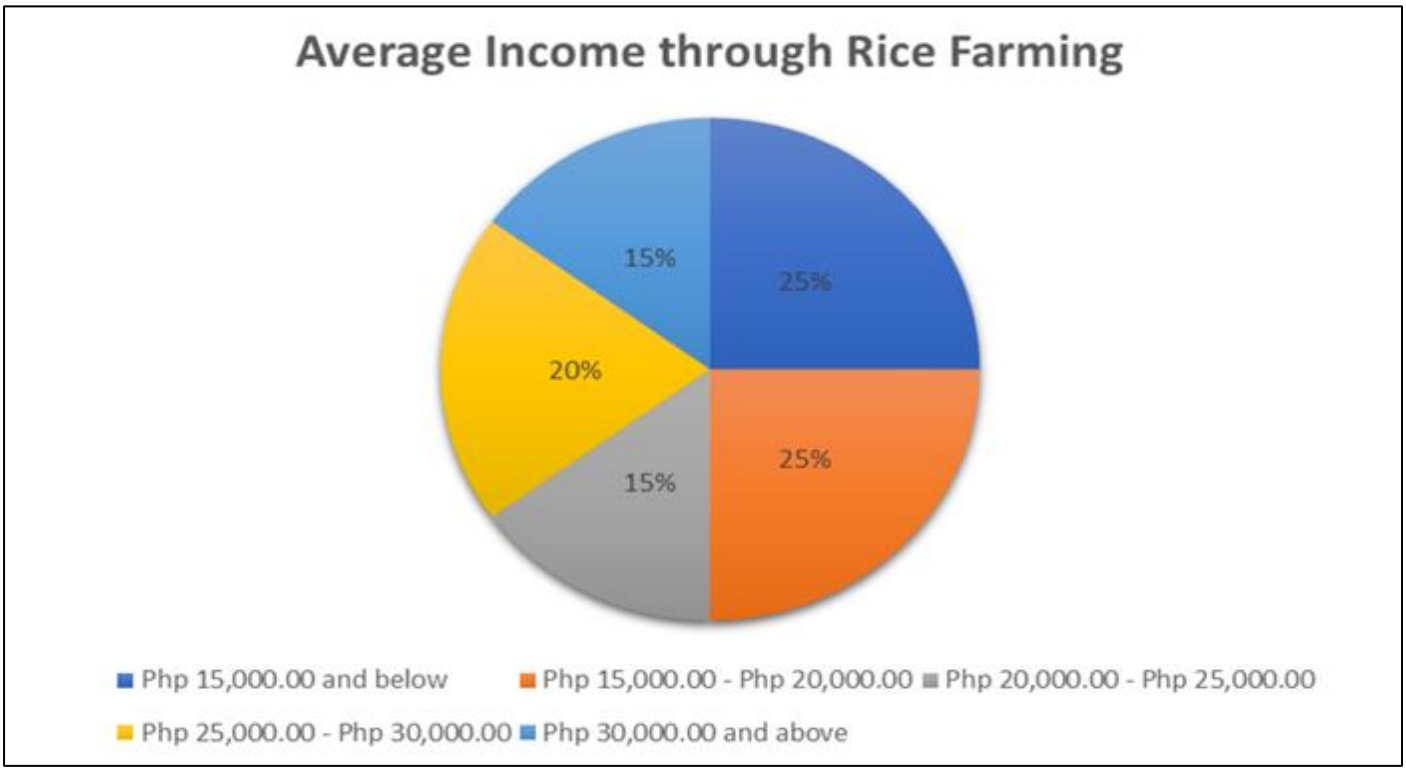

Fig 8 Average Income of Rice Paddy Farmers Sample in Nueva Ecija

The findings reveal that the highest proportions of income levels through Rice paddy farming are Php 15,000 and below and Php 15,000–Php 20,000, each comprising 25% (5) of the respondents. This is followed by Php 25,000–Php 30,000 at 20% (4) and Php 20,000–Php 25,000 at 15% (3). The lowest proportion is the Php 30,000 and above income bracket at 15% (3). Average income according to Ricelytics for year 2022 in Nueva Ecija is Php 37,426.00.

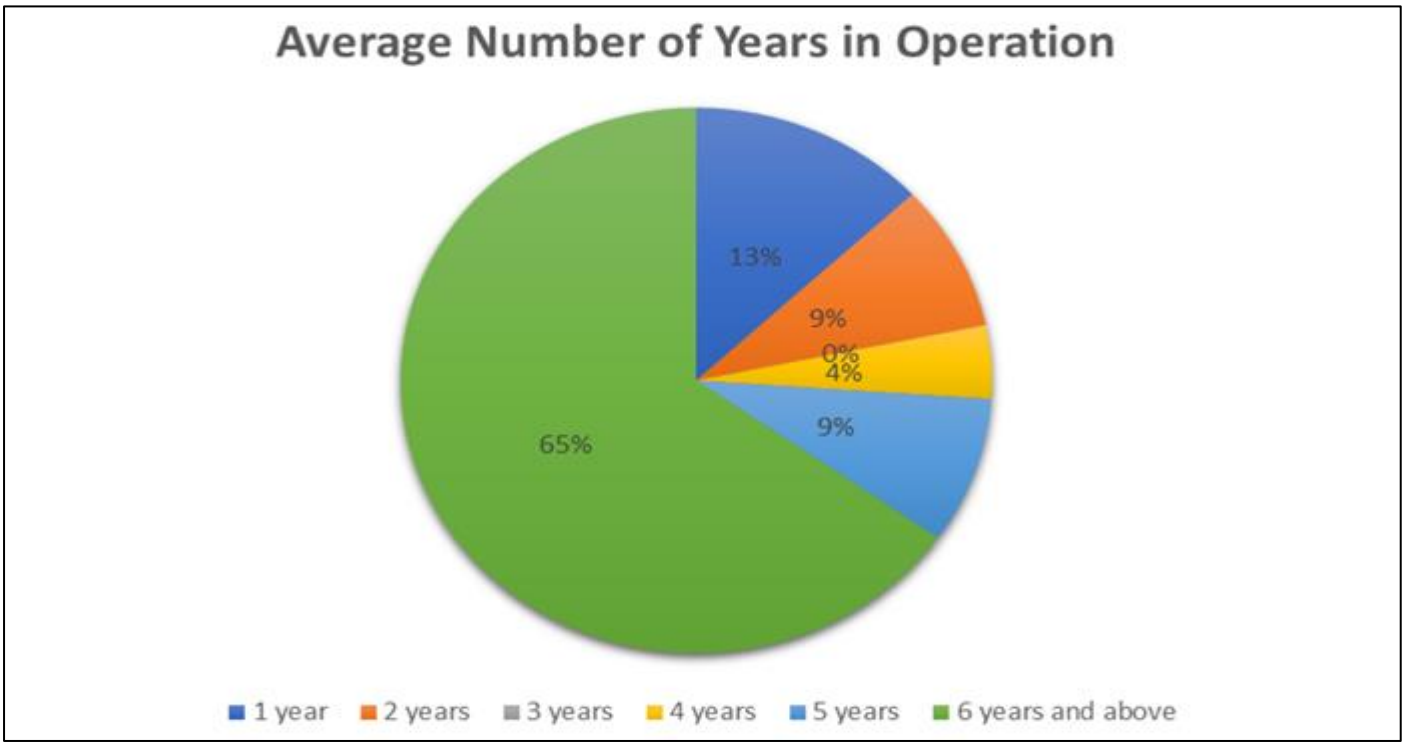

Fig 9 Average Number of Years in Rice Paddy Farming Sample in Nueva Ecija

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The findings show that the largest proportion of respondents have been operating for 6 years and above, comprising 65% (13) of the sample. This is followed by 1 year at 13% (3), and both 2 years and 5 years at 9% (2) each. Meanwhile, 4 years accounts for 4% (1), and 3 years has the lowest proportion at 0% (0), with no respondents in the category of average number of years in operations when it comes to rice paddy farming.

Fig 10 Organizational Membership of Rice Paddy Farmers Sample in Nueva Ecija

The findings of the study show that 45% (9) of the total respondents have some affiliation or association in the rice farming industry while 55% (11) respondents do not have any affiliation or association in the rice farming industry. 44% are non-members of organizations in the rice farming industry while 56% are members according to Ricelytics for the year 2022 in Nueva Ecija.

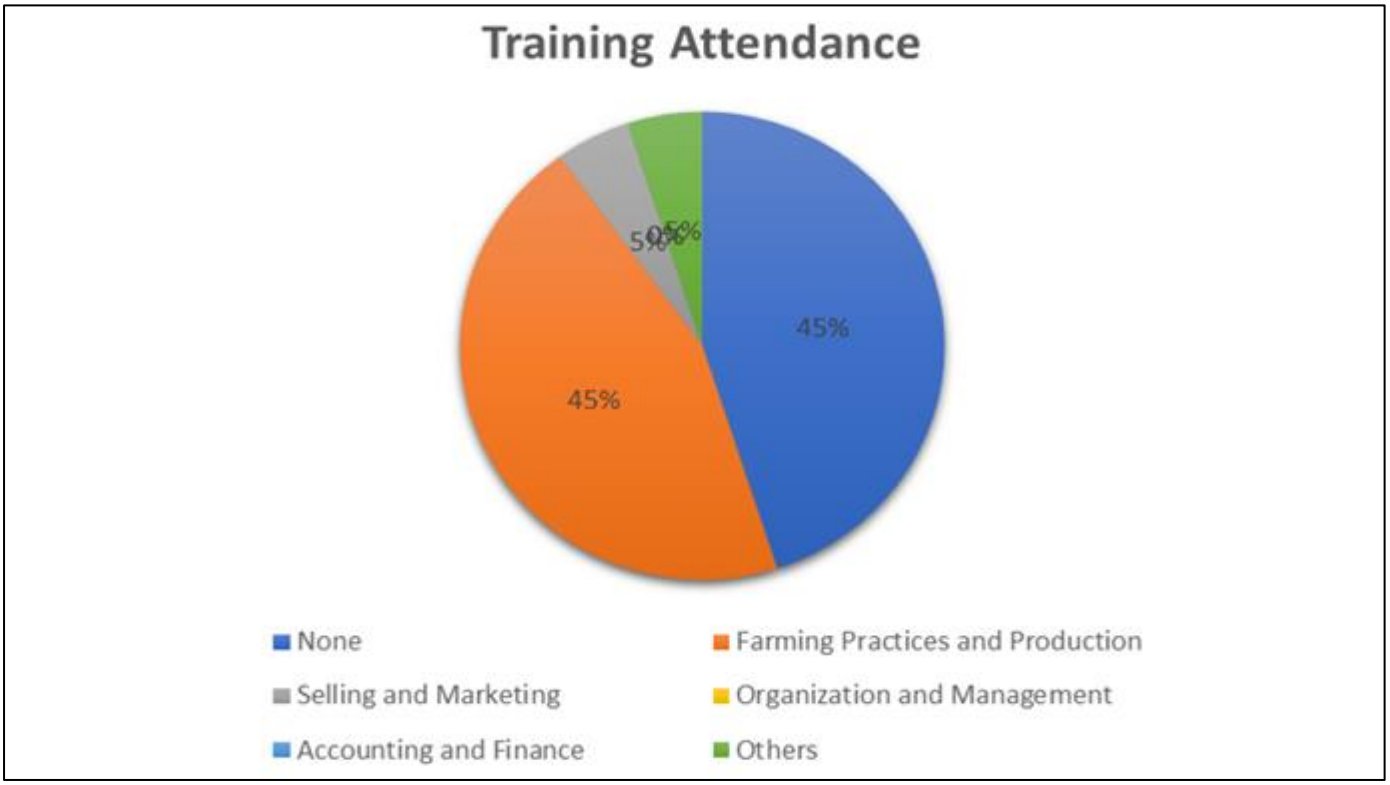

Fig 11 Training Attendance of Rice Paddy Farmers Sample in Nueva Ecija

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The findings show that the largest proportion of respondents either did not attend any training or attended training on Farming Practices and Production, each comprising 45% (9) of the sample. This is followed by Selling and Marketing and Others, which both account for 5% (1) of the respondents. Meanwhile, Organization and Management and Accounting and Finance have the lowest proportions at 0% (0), indicating that no respondents participated in these types of training. According to Ricelytics for the year 2022 in Nueva Ecija, 23% received training while the remaining 77% did not.

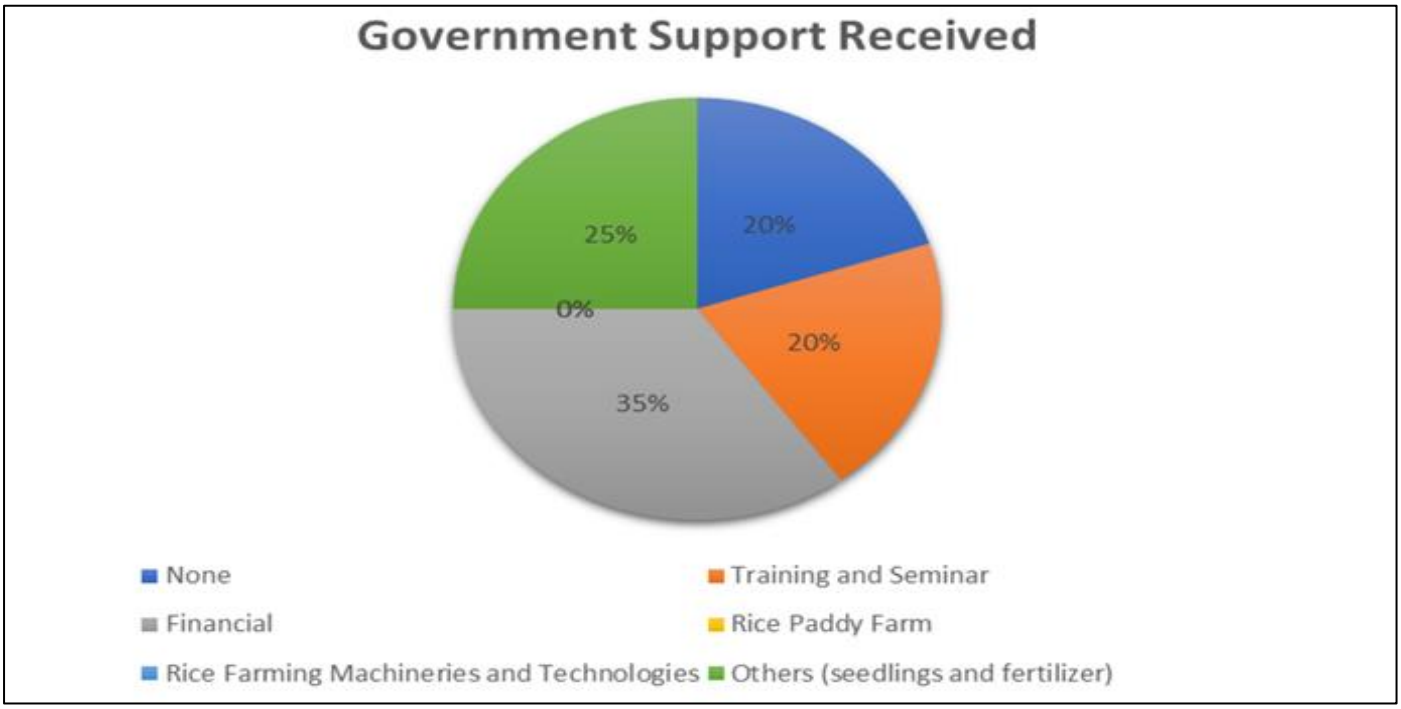

Fig 12 Government Support Received Rice Paddy Farmers Sample in Nueva Ecija

The findings show that the largest proportion of respondents received financial assistance, comprising 35% (7) of the sample. This is followed by both no support and training and seminar, which each account for 20% (4) of the respondents. Meanwhile, other forms of support, such as seedlings and fertilizer, represent 25% (5) of the sample. Lastly, rice paddy farm support has the lowest proportion at 0% (0), indicating that no respondents received aid under this category.

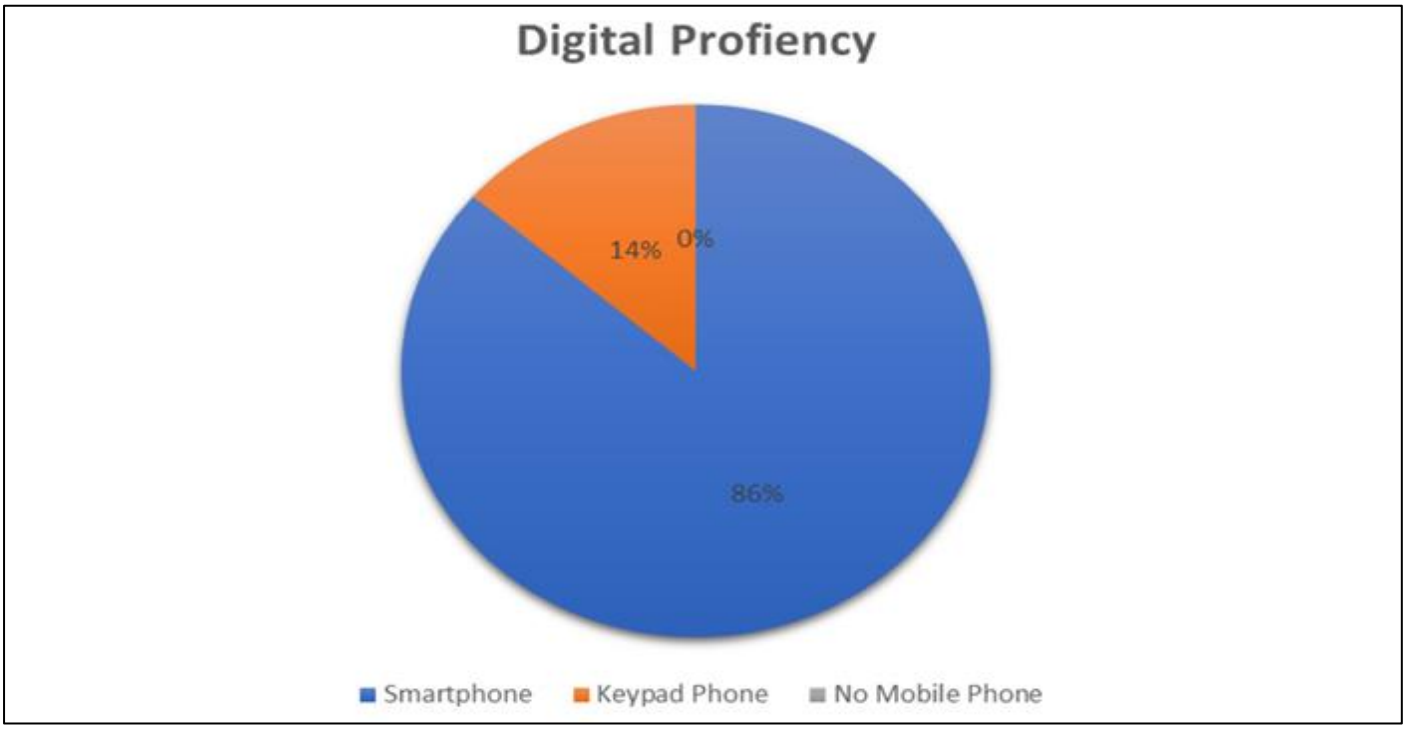

Fig 13 Digital Proficiency of Rice Paddy Farmers Sample in Nueva Ecija

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The findings of the study show that almost all respondents 86% (19) are digitally proficient through smartphones while 14% (3) respondents are still using keypad phones with two of said respondents also having smartphones. According to Ricelytics for the year 2022 in Nueva Ecija 90% of rice paddy farmers have smartphones, 6% have keypad phones while 4% do not have phones at all.

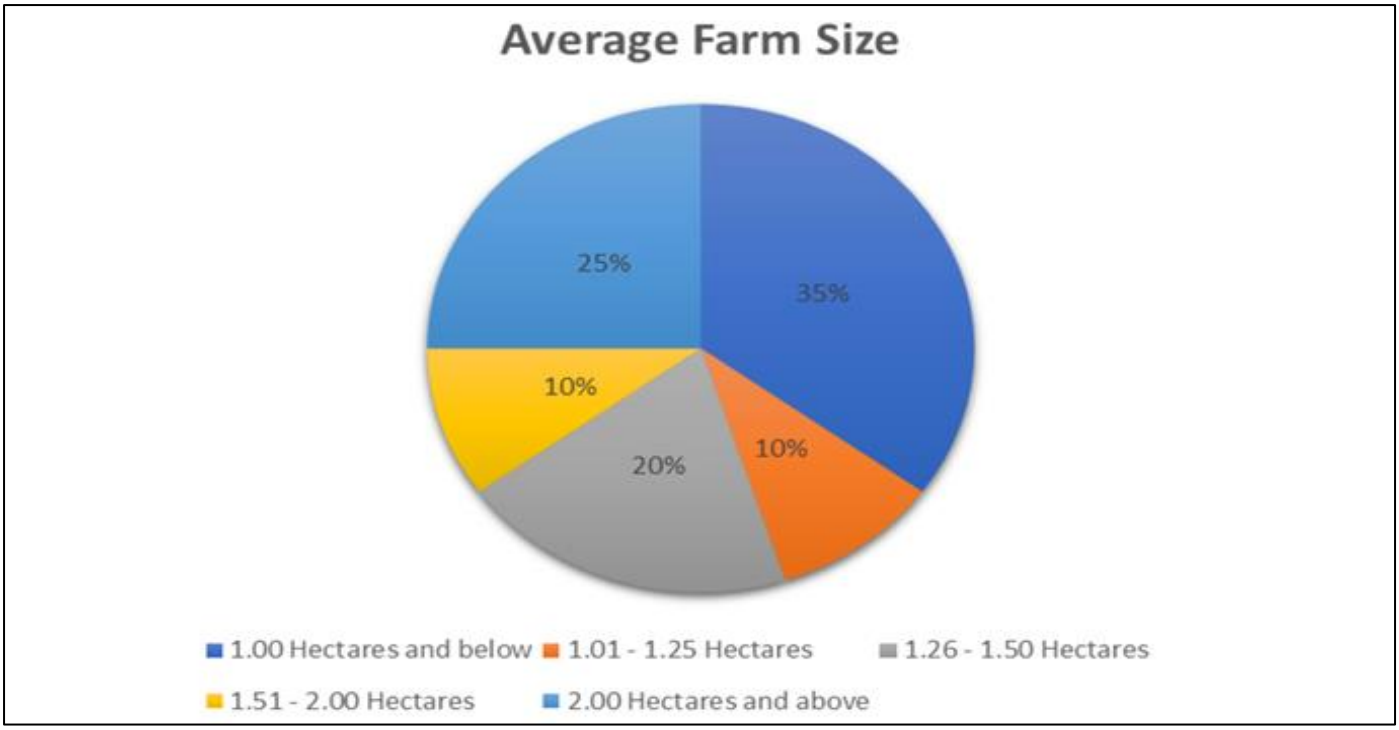

Fig 14 Average Farm Size of Rice Paddy Farmers Sample in Nueva Ecija

The findings show that the largest proportion of respondents operate farms 1.00 hectare and below, comprising 35% (7) of the sample. This is followed by those cultivating 2.00 hectares and above at 25% (5), and respondents with farm sizes ranging from 1.26 to 1.50 hectares, accounting for 20% (4). Meanwhile, both the 1.01 to 1.25 hectares and 1.51 to 2.00 hectares categories each represent 10% (2) of the respondents. None of the categories recorded a proportion of 0%, indicating that all identified farm size classifications had at least some representation among the farmers. According to Ricelytics for the year 2022 in Nueva Ecija, the average farm size is 1.69 hectares.

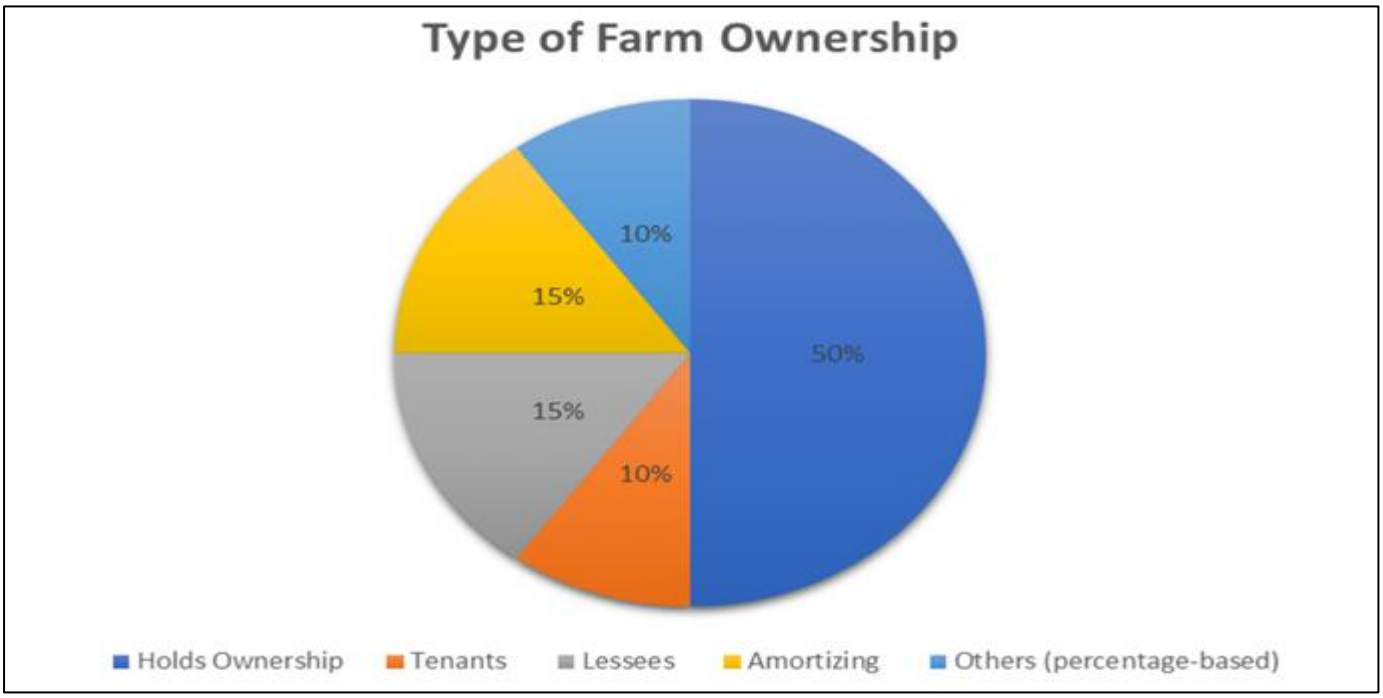

Fig 15 Type of Farm Ownership of Rice Paddy Farmers Sample in Nueva Ecija

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Findings show that rice paddy farmers in Nueva Ecija 50% (10) holds ownership of the rice paddy farm, 15% (3) are amortizing, 15% (3) are lessees, 10% (2) are tenants and the other 10% (2) are amortizing. According to Ricelytics for the year 2022 in Nueva Ecija, 47% of rice paddy farmers hold ownership of their farm, 36% are tenants, 11% are leased, 5% are other cases and the remaining 1% is amortized.

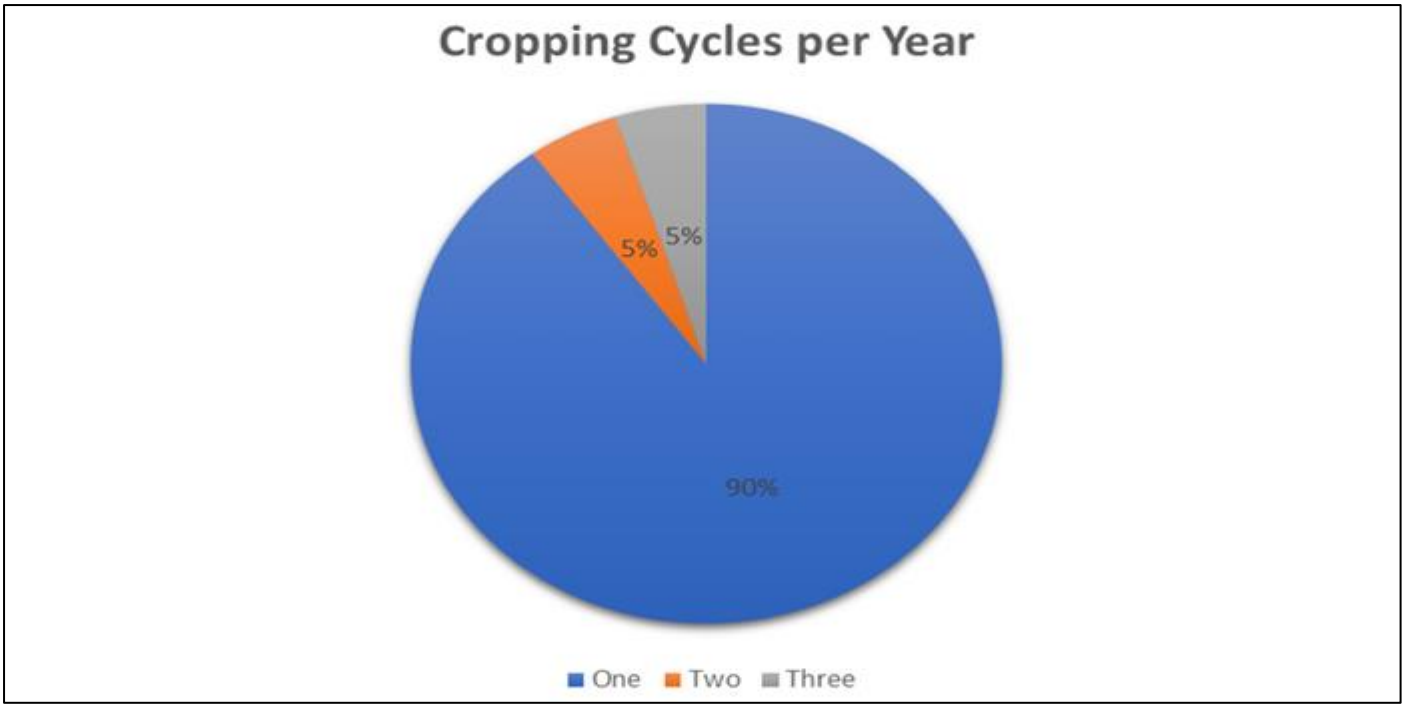

Fig 16 Cropping Cycles Per Year of Rice Paddy Farmers Sample in Nueva Ecija

The findings of the study show that rice paddy farmers in Nueva Ecija typically has one cropping cycle per year with 90% (18) of the respondents, 5% (1) of total respondents with one cropping cycle, and 5% (1) of total respondents with three cropping cycles.

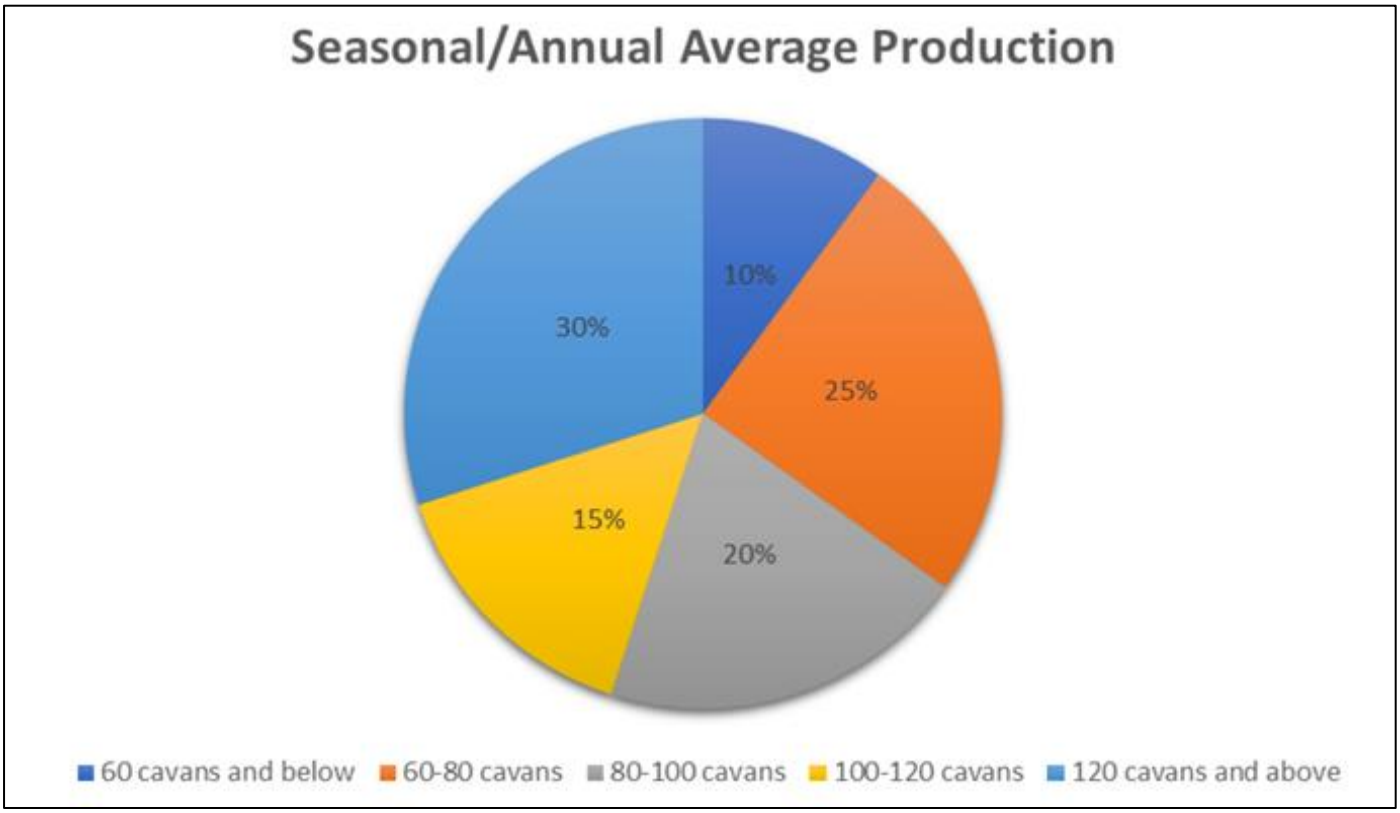

Fig 17 Season Average Production of Rice Paddy Farmers Sample in Nueva Ecija

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Findings in the study show thatthe sample rice paddy farmers in Nueva Ecija typical produce 30% (6) produce 60 cavans of rice or below, 25% (5) 60-80 cavans of rice, 20% (4) produce 80-100 cavans of rice, 15% (3) produce 100-120 cavans, and 10% (2) produce 120 cavans of rice and above.

➢ *Analysis*

- *Socio-Demographic Characteristics*

Table 2 Sex

Sex	Frequency	Percent
Female (Babae)	8	40.0
Male (Lalaki)	12	60.0
Total	20	100.0

Of the 20 respondents (N = 20), 12 were male (60.0%) and 8 were female (40.0%), indicating a majority of male respondents in the sample.

Table 3 Age

Age	Frequency	Percent
Early Adulthood (Di-gaanong nakatatanda) - 21-35	4	20.0
Mature Adulthood (Nakatatanda) - 50 above	9	45.0
Midlife (Katamtamang gulang) - 36-50	7	35.0
Total	20	100.0

Of the 20 respondents (N = 20), 9 were in mature adulthood (≥50 years; 45.0%), 7 were in midlife (36–50 years; 35.0%), and 4 were in early adulthood (21–35 years; 20.0%), indicating that the sample was concentrated toward older adults (majority ≥50 years).

Table 4 Highest Educational Attainment

Educational Attainment	Frequency	Percent
College (Kolehiyo)	8	40.0
High school (Hayskul)	10	50.0
Postgraduate (Gradwadong Pag-aaral)	2	10.0
Total	20	100.0

Of the 20 respondents (N = 20), half completed high school (50.0%), 40.0% attained a college education, and 10.0% had postgraduate studies. This shows that the sample was composed primarily of individuals with a high school level of educational attainment.

Table 5 Household Size

Size	Frequency	Percent
3-4	11	55.0
5-6	4	20.0
7 and above (7 at pataas)	3	15.0
Option 1-2	2	10.0
Total	20	100.0

Of the 20 respondents (N = 20), 11 reported a household size of 3–4 members (55.0%), 4 reported 5–6 members (20.0%), 3 reported 7 or more members (15.0%), and 2 reported 1–2 members (10.0%), indicating that most respondents lived in households of 3–4 people.

Table 6 Monthly/Seasonal Average Income through Rice Farming

Monthly Average Income	Frequency	Percent
Php 15,000.00 - Php 20,000.00	5	25.0
Php 15,000.00 and below (Php 15,000.00 at pababa)	5	25.0
Php 20,000.00 - Php 25,000.00	3	15.0
Php 25,000.00 - Php 30,000.00	4	20.0
Php 30,000.00 and above (Php 30,000.00 at pataas)	3	15.0
Total	20	100.0

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Of the 20 respondents (N = 20), 5 (25.0%) reported a monthly average income from rice farming of Php15,000–Php20,000, 5 (25.0%) reported Php15,000 or below, 3 (15.0%) reported Php20,000–Php25,000, 4 (20.0%) reported Php25,000–Php30,000, and 3 (15.0%) reported Php30,000 and above. Overall, 10 respondents (50.0%) earned Php20,000 or less per month from rice farming, indicating that half of the sample have low-to-moderate monthly incomes from this source.

Table 7 Number of Years in Operation

Years in Operation	Frequency	Percent
1 year (Isang taon)	3	15.0
3 years (Tatlong taon)	2	10.0
4 years (Apat na taon)	1	5.0
5 years (Limang taon)	2	10.0
6 years and above (anim na taon at pataas)	12	60.0
Total	20	100.0

Of the 20 respondents (N = 20), 12 had been in operation for 6 years or more (60.0%), 3 for 1 year (15.0%), 2 for 3 years (10.0%), 2 for 5 years (10.0%), and 1 for 4 years (5.0%). This indicates that a majority of respondents had relatively long experience in operation, with most (60.0%) reporting six or more years.

Table 8 Training Attendance

Training Attendance	Frequency	Percent
Bagumbayan PMPC and MAO Llanera conducted seminars	1	5.0
Farming Practices and Production (Kasanayan at Produksiyong Pagsasaka)	8	30.0
Farming Practices and Production (Kasanayan at Produksiyong Pagsasaka), Organization and Management (Organisasyon at Pamamahala)	1	5.0
Farming Practices and Production (Kasanayan at Produksiyong Pagsasaka), Selling and Marketing (Pagbebenta at Pagpapalaganap)	1	5.0
Farming Practices and Production (Kasanayan at Produksiyong Pagsasaka), Selling and Marketing (Pagbebenta at Pagpapalaganap), Organization and Management (Organisasyon at Pamamahala), Accounting and Finance (Pagkakalkula at Pananalapi)	1	5.0
None (Wala)	9	45.0
Selling and Marketing (Pagbebenta at Pagpapalaganap)	1	5.0
Total	20	100.0

Of the 20 respondents (N = 20), 9 reported no training attendance (45.0%), while 11 (55.0%) reported attending at least one training. The most frequently reported single training was Farming Practices and Production (8, 30.0%). The remaining respondents attended various single or combined trainings in small numbers: Bagumbayan PMPC and MAO Llanera (1, 5.0%); Selling and Marketing (1, 5.0%); Farming Practices + Organization and Management (1, 5.0%); Farming Practices + Selling and Marketing (1, 5.0%); and a combination of Farming Practices, Selling and Marketing, Organization and Management, and Accounting and Finance (1, 5.0%). Overall, nearly half of the sample had not participated in any formal training, indicating a potential need for expanded training outreach.

Table 9 Government Support Received

Government Support Received	Frequency	Percent
Abono	1	5.0
Binhi	2	10.0
Financial (Pampinansyal)	3	15.0
Financial (Pampinansyal), Fertilizer, Seeds	1	5.0
Financial (Pampinansyal), Palay Seeds and fertilizer	1	5.0
Financial (Pampinansyal), Rice Paddy Farm (Lupa sa Pagsasaka), Rice Farming Machineries and Technologies (Makinaryang Pangpalayan)	1	5.0
Inputs such as fertilizers and seeds	1	5.0
None (Wala)	4	20.0
Pataba ng Lupa and Binhi	1	5.0
Training and Seminar (Pagsasanay at Seminaryo)	2	10.0
Training and Seminar (Pagsasanay at Seminaryo), Financial (Pampinansyal)	1	5.0
Training and Seminar (Pagsasanay at Seminaryo), Financial (Pampinansyal), Rice Paddy Farm (Lupa sa Pagsasaka)	1	5.0
Training and Seminar (Pagsasanay at Seminaryo), Financial (Pampinansyal), Rice Paddy Farm (Lupa sa Pagsasaka), Rice Farming Machineries and Technologies (Makinaryang Pangpalayan)	1	5.0

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Total	20	100.0

Of the 20 respondents (N = 20), 9 reported receiving some form of financial support either alone or in combination with other assistance (45.0%), 7 received inputs such as seeds and/or fertilizers (35.0%), 5 received training and seminars (25.0%), and 3 received support related to rice paddy land and/or farming machineries and technologies (15.0%). Four respondents (20.0%) reported receiving no government support. Overall, most respondents (80.0%) received at least one type of government assistance, with financial aid being the most frequently reported form.

Table 10 Digital Proficiency

Digital Proficiency	Frequency	Percent
Digital savvy	1	5.0
Keypad Phone	1	5.0
Smartphone	16	80.0
Smartphone, Keypad Phone	2	10.0
Total	20	100.0

Of the 20 respondents (N = 20), 16 reported using a smartphone (80.0%), 2 reported using both a smartphone and a keypad phone (10.0%), 1 reported using a keypad phone only (5.0%), and 1 reported being digital savvy (5.0%). These results indicate that the majority of respondents are smartphone users, suggesting generally high digital access and proficiency within the sample.

Table 11 Type of Farm Ownership

Type of Farm Ownership	Frequency	Percent
Amortizing (Nagbabayad ng Amortisasyon)	3	15.0
Holds Ownership (May-ari ng Sakahan)	10	50.0
Lessees (Nangungupahan)	3	15.0
Porsyentuhan	1	5.0
Sanla	1	5.0
Tenants (Umuupa)	2	10.0
Total	20	100.0

Of the 20 respondents (N = 20), 10 held ownership of their farms (50.0%), 3 were amortizing (15.0%), 3 were lessees (15.0%), 2 were tenants (10.0%), and 1 each reported porsyentuhan and sanla arrangements (5.0% each). This indicates that half of the sample own their farms, suggesting a predominance of owner-operated farms in the sample, while the remainder operate under various rental, sharecropping, or financing arrangements.

Table 12 Average Farm Size in Hectares (ha)

Ha	Frequency	Percent
1.00 Hectares and below (1.00 ektarya at pababa)	7	35.0
1.01 - 1.25 Hectares	2	10.0
1.26 - 1.50 Hectares	4	20.0
1.51 - 2.00 Hectares	2	10.0
2.00 Hectares and above (2.00 ektarya at pataas)	5	25.0
Total	20	100.0

Of the 20 respondents (N = 20), 7 managed farms sized 1.00 hectare or below (35.0%), 4 managed farms between 1.26 and 1.50 hectares (20.0%), 5 managed farms of 2.00 hectares or more (25.0%), and smaller proportions managed farms of 1.01–1.25 hectares (2, 10.0%) and 1.51–2.00 hectares (2, 10.0%). Overall, the distribution shows a mix of small to moderately sized farms, with over one-third cultivating 1 hectare or less.

Table 13 Monthly/Seasonal Average Production in Kg

Monthly/Seasonal Average Production in kg	Frequency	Percent
100-120 cavans	3	15.0
120 cavans and above	6	30.0
60 cavans and below	2	10.0
60-80 cavans	5	25.0
80-100 cavans	4	20.0
Total	20	100.0

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Of the 20 respondents (N = 20), 6 produced 120 cavans and above (30.0%), 5 produced 60–80 cavans (25.0%), 4 produced 80–100 cavans (20.0%), 3 produced 100–120 cavans (15.0%), and 2 produced 60 cavans and below (10.0%), indicating that the largest proportion of respondents reported relatively high seasonal/monthly production (≥120 cavans). Overall, production levels varied across the sample, with a spread from low (≤60 cavans) to high (≥120 cavans).

Table 14 Cropping Per Year

Cropping Per Year	Frequency	Percent
One (Isa)	1	5.0
Three (Tatlo)	1	5.0
Two (Dalawa)	18	90.0
Total	20	100.0

The majority of respondents (90%) reported practicing two cropping cycles per year, while a small number indicated one cropping cycle (5%) or three cropping cycles (5%). This suggests that biannual cropping is the predominant agricultural practice among the sampled farmers, reflecting both land capacity and local farming norms.

- *Production Cost in Terms of:*

Table 15 Fixed Cost: Land / Land Rent (Quantity)

Land / Land Rent (Quantity)	Frequency	Percent
1 ha	1	5.0
1.25 ha	1	5.0
1.5 ha	3	15.0
1.5 ha owned & 3.5 ha rented	1	5.0
2 ha	3	15.0
3 ha	1	5.0
3.75 ha	1	5.0
4 ha	1	5.0
4.5 ha	1	5.0
5 ha	1	5.0
1 ha (rent: PHP 15,000)	2	10.0
None / N/A / Wala	4	20.0
Total	**20**	**100.0**

The table shows that a considerable portion of the respondents reported no land ownership or land rent, accounting for 20% of the sample. This indicates that one-fifth of them do not utilize farmland. The most frequently reported actual land sizes were 1.5 hectares and 2 hectares, each representing 15% of the respondents, suggesting that small-to-medium landholdings are typical within the group.

Meanwhile, unique responses such as “1.5 ha owned & 3.5 ha rented” and the various hectare values above 3 ha show that a smaller subset engages in larger-scale land use. Lastly, 10% reported renting land at PHP 15,000 per hectare, reflecting the presence of rental-based farm operations. Overall, the distribution highlights a diverse range of land access—from no land at all to larger individual holdings—indicating variability in agricultural capacity among respondents.

Table 16 Land Rent (Year / Acquisition Cost)

Land Rent (Year / Acquisition Cost)	Frequency	Percent
100 per sack (binhi)	1	5.0
150	1	5.0
150,000	1	5.0
180,000	1	5.0
19’s (no specific amount)	1	5.0
1990 – 20,000	1	5.0
1990s – 15,000	1	5.0
2,000,000	1	5.0
2000 (no amount stated)	1	5.0
2005 – 30,000 (advance/deposit)	1	5.0
2021 – 200,000 (sanla)	1	5.0
2023 – 700,000	1	5.0
3,000,000	1	5.0

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350,000	1	5.0
73,000	1	5.0
Inherited – 1.5 ha	1	

The table shows a highly varied range of responses regarding land acquisition cost and year, indicating diverse modes of land access among respondents. A total of 15% reported no acquisition details ("None/N/A"), suggesting that some do not engage in purchasing or renting land.

Most acquisition amounts represent individual and unique entries, ranging from very low expenditures (e.g., 100 per sack of binhi, 150) to substantial land-related investments such as ₱2,000,000, ₱3,000,000, and ₱700,000. This wide spread highlights the economic diversity of land transactions within the group.

Some responses include year-based acquisitions (e.g., 1990, 2005, 2021, 2023), while others describe inheritance or yearly rental payments.

Table 17 Farm Machinery (Quantity)

Farm Machinery (Quantity)	Frequency	Percent
No machinery (0 / Missing)	10	50.0
1	8	40.0
3	1	5.0
5	1	5.0
Total	**20**	**100.0**

Half of the respondents (50%) reported having no farm machinery, either by indicating "0" or leaving the item unanswered. This suggests that a substantial portion of farmers rely on manual labor or borrowed/shared equipment.

Meanwhile, 40% own at least one unit of farm machinery, indicating some level of mechanization among nearly half of the group.

Table 18 Farm Machinery Acquisition Cost

Farm Machinery Acquisition Cost (₱)	Frequency	Percent
No equipment (0 / missing)	12	60.0
800	1	5.0
2,003	1	5.0
2,010	1	5.0
3,000	1	5.0
15,000	1	5.0
25,000	1	5.0
25,500	1	5.0
70,000	1	5.0
Total	**20**	**100.0**

The majority of respondents (60%) fall under the No equipment category, meaning they either reported ₱0 or did not provide any acquisition cost. This suggests that more than half of the group likely does not own farm equipment or is unable to account for its cost.

Among those who did report acquisition costs (40%), the values are highly varied—from ₱800 to ₱70,000.

Table 19 Farm Equipment (Quantity)

Farm Equipment (Quantity)	Frequency	Percent
No equipment (0 / missing)	9	45.0
1	5	25.0
2	4	20.0
3	1	5.0
5	1	5.0
Total	**20**	**100.0**

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Nearly half of the respondents (45%) fall under the No equipment category, indicating that a substantial portion either owns no farm equipment or did not report any. Among those with equipment, the most common level of ownership is one unit (25%), followed by two units (20%). Only a small number own three or five units (5% each), representing higher equipment investment.

Table 20 Farm Equipment Acquisition Cost

Farm Equipment Acquisition Cost (₱)	Frequency	Percent
No equipment cost reported (0 / missing)	12	60.0
800	1	5.0
2,003	1	5.0
2,010	1	5.0
3,000	1	5.0
15,000	1	5.0
25,000	1	5.0
25,500	1	5.0
70,000	1	5.0
Total	**20**	**100.0**

Most respondents (60%) did not report any acquisition cost for farm equipment, either because they do not own equipment or chose not to disclose the cost. This suggests limited investment in farm equipment for more than half of the group.

Among those who did report, acquisition costs vary widely—from ₱800 to ₱70,000—showing considerable differences in the type and value of equipment owned. This range indicates that some farmers have basic, low-cost tools, while others have invested in more expensive equipment.

Overall, the data reveals that only a minority (40%) have made financial investments in farm equipment, and the levels of investment differ significantly across respondents.

Table 21 Insurance Premiums (Quantity)

Insurance Premiums (Quantity)	Frequency	Percent
No Insurance (0 / Missing)	12	60.0%
1 Premium	4	20.0%
2 Premiums	2	10.0%
3 Premiums	1	5.0%
5 Premiums	1	5.0%
Total	**20**	**100.0%**

Most respondents (60%) reported having no insurance premiums, indicating that a majority either did not purchase insurance or did not provide information about it. A smaller proportion reported holding one premium (20%), while even fewer reported two or more premiums (20% combined). This suggests that insurance utilization among the group is generally low, with only a minority engaging in multiple insurance arrangements.

Table 22 Insurance Premium (₱)

Insurance Premium (₱)	Frequency	Percent
0 / Missing	13	65.0
1.00	1	5.0
1,500.00	1	5.0
2,000.00	1	5.0
2,003.00	1	5.0
10,000.00	1	5.0
25,000.00	1	5.0
70,000.00	1	5.0
Total	**20**	**100.0**

The data show that a large majority of the respondents did not report any insurance premium expenditure, as 65% fell under the combined “0 / Missing” category. This indicates that most farmers either did not pay for insurance premiums or did not provide

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information regarding this variable. Each of the remaining premium amounts was reported by only one respondent (5% each), suggesting highly varied and individualized insurance costs among those who did participate.

Table 23 Tax (Quantity)

Tax (Quantity)	Frequency	Percent
No Tax / Not Applicable	16	80.0%
2,000	1	5.0%
2,003	1	5.0%
4	1	5.0%
90,000	1	5.0%
Total	**20**	**100.0%**

A large majority of the respondents (80%) indicated that they either did not pay tax or that the item did not apply to them. Only a small proportion (20%) reported actual tax amounts, which varied widely from minimal (₱4) to very high (₱90,000). This suggests that most respondents have no tax-related expenditures for their farming operations, while a minority incur taxes of varying magnitudes.

Table 24 Tax (Year & Acquisition)

Tax (Year & Acquisition)	Frequency	Percent
No Tax / Not Reported	13	65.0%
1	3	15.0%
2	1	5.0%
4.5	1	5.0%
2,000	1	5.0%
40,000	1	5.0%
Total	**20**	**100.0%**

The results show that most respondents (65%) either reported zero tax or did not provide any tax-related information. Only 35% indicated specific tax amounts, with values ranging from very minimal (1–4.5) to substantially higher amounts such as ₱2,000 and ₱40,000. This pattern suggests that the majority of farmers do not incur or do not document tax expenses for their agricultural operations, while a small portion have tax obligations that vary widely in amount.

- *Variable Cost*

Table 25 Seedling Quantity

Seedling Quantity	Frequency	Percent
No Seedlings / Not Reported	13	65.0%
1 Seedling	2	10.0%
2 Seedlings	1	5.0%
4 Seedlings	2	10.0%
5 Seedlings	1	5.0%
6 Seedlings	1	5.0%
Total	**20**	**100.0%**

Most respondents (65%) reported either having no seedlings or did not provide information. Among those who did report quantities, the most common amounts were 1 and 4 seedlings (10% each). Only small proportions indicated 2, 5, or 6 seedlings (5% each). These results suggest that the majority of the farmers did not engage in seedling acquisition during the period of reporting, while those who did tended to purchase only a small number.

Table 26 Seedling Total Seasonal Cost (PHP)

Seedling Total Seasonal Cost (PHP)	Frequency	Percent
No Cost Reported / Missing	6	30.0%
1,000	1	5.0%
3,000	1	5.0%

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3,600	1	5.0%
5,000	2	10.0%
6,000	1	5.0%
7,000	1	5.0%
8,400	1	5.0%
15,000	1	5.0%
24,800	1	5.0%
25,000	1	5.0%
30,000	1	5.0%
50,000	1	5.0%
100,000	1	5.0%
Total	**20**	**100.0%**

A total of 70% of respondents reported specific seasonal costs for seedlings, while 30% did not provide any cost information. Among those who spent on seedlings, the amounts varied widely—from as low as ₱1,000 to as high as ₱100,000. The most frequently reported cost was ₱5,000 (10%). The wide range of expenditures suggests significant differences in farm size, seedling type, or production practices. Overall, although most respondents invested in seedlings, the cost distribution indicates varying levels of financial capacity and operational scale among farmers.

Table 27 Planting Quantity

Planting Quantity	Frequency	Percent
Other (Non-numeric / Mixed Responses)	8	40.0%
1	2	10.0%
2	1	5.0%
4	1	5.0%
5	1	5.0%
10	1	5.0%
20	1	5.0%
4.5	1	5.0%
9000	1	5.0%
Total	**20**	**100.0%**

The data show that 40% of the respondents provided mixed or non-numeric answers (e.g., number of workers, sowing method, kilograms, or hectares), indicating a lack of standard reporting for planting quantity. Among the numeric responses, most categories were represented by only one respondent, except for “1” which appeared for 10% of the sample.

Table 28 Planting Total Seasonal Cost (PHP)

Planting Total Seasonal Cost (PHP)	Frequency	Percent
No Cost Reported / Missing	4	20.0%
1,400	1	5.0%
3,000	1	5.0%
7,500 per hectare	1	5.0%
10,000	2	10.0%
12,000	1	5.0%
14,000 (2 seasons)	1	5.0%
15,000	1	5.0%
22,500	1	5.0%
24,000	1	5.0%
30,000	1	5.0%
35,000	1	5.0%
50,000	1	5.0%
50,000 per hectare	1	5.0%

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100,000	1	5.0%
Detailed Cost (₱12,500 + ₱7,000)	1	5.0%
Total	**20**	**100.0%**

A total of 80% of respondents reported specific seasonal planting costs, while 20% did not provide any cost information. Reported expenses ranged widely—from as low as ₱1,400 to as high as ₱100,000—reflecting significant variability in planting-related expenditures. Some responses indicated costs "per hectare" or "per season," and one detailed cost breakdown (e.g., bunot ng punla and labor fees), suggesting differences in farm size and production methods. Overall, planting costs varied considerably among farmers, highlighting diverse operational scales and labor requirements.

Table 29 Fertilizing Quantity

Fertilizing Quantity	Frequency	Percent
No Quantity Reported	4	20.0%
0	1	5.0%
1	1	5.0%
2	1	5.0%
4	1	5.0%
5	1	5.0%
10	1	5.0%
15	1	5.0%
30 sacks	1	5.0%
5,000 (unclear unit)	2	10.0%
Other	6	30.0%
Total	**20**	**100.0%**

The findings show that fertilizing quantities were highly inconsistent across respondents, with 20% giving no quantity at all and 30% providing mixed or unclear units (e.g., bags, cavans, workers, fertilizer combinations). Among the clear numeric responses, only single respondents reported each amount, indicating no dominant pattern. This variability suggests that farmers use different measurement systems or interpret "fertilizing quantity" differently, reflecting diverse farming practices and resource availability. Standardizing units in future surveys would help produce more uniform and comparable data.

Table 30 Fertilizing Total Seasonal Cost (PHP)

Fertilizing Total Seasonal Cost (PHP)	Frequency	Percent
No Cost Reported	4	20.0%
1,400 (2 seasons)	1	5.0%
1,400	1	5.0%
3,000	2	10.0%
3,000–3,500	1	5.0%
7,500	1	5.0%
10,000	1	5.0%
20,000	2	10.0%
30,000	2	10.0%
35,000	1	5.0%
45,000	1	5.0%
50,000	1	5.0%
100,000	1	5.0%
Other (Non-standard Responses)*	1	5.0%
Total	**20**	**100.0%**

A total of 80% of respondents reported specific fertilizing costs, while 20% did not indicate any expenses. Reported costs varied widely—from as low as ₱1,400 to as high as ₱100,000—showing substantial differences in farm size, fertilizer type, and

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farming practices. Mid-range costs between ₱3,000 and ₱35,000 accounted for most of the responses, suggesting these amounts reflect typical fertilization expenses among the farmers surveyed.

Table 31 Weeding Quantity

Weeding Quantity	Frequency	Percent
0 / No Answer (combined)	5	25.0%
1	4	20.0%
2	3	15.0%
3	1	5.0%
4	2	10.0%
5 packs	1	5.0%
1000	1	5.0%
1500	1	5.0%
8 workers (2 seasons)	1	5.0%
Not Applicable (NA)	1	5.0%
Total	**20**	**100.0%**

Based on the results, the largest group of respondents reported no weeding or gave no answer (25%). This suggests that a quarter of the farmers either did not conduct weeding or did not specify their weeding quantity. Meanwhile, 1 unit of weeding was the next most common response (20%), followed by 2 units (15%). Smaller proportions reported higher or specialized quantities such as 3–4 units (5–10%) or context-specific responses (e.g., *5 packs*, *8 workers for 2 seasons*), each representing 5% of the total sample. Overall, the findings indicate that weeding practices vary widely among farmers, with no single standardized quantity consistently followed.

Table 32 Weeding Total Seasonal Cost

Weeding Total Seasonal Cost	Frequency	Percent
Missing/Not Reported	4	20.0
1,400	1	5.0
1,500	2	10.0
2.00	1	5.0
2,000	1	5.0
2,500	1	5.0
4,000	1	5.0
4,500	1	5.0
5,600 (2 seasons)	1	5.0
25,000	1	5.0
35,000	1	5.0
100,000	1	5.0
Included in 10% share	1	5.0
Included in farm share (“Porsyentuhan”)	2	10.0
Total	**20**	**100.0**

The results show wide variation in the total seasonal cost for weeding. One-fifth of the respondents (20%) did not provide any cost estimate. Among those who reported an amount, the most common cost was ₱1,500 (10%), followed by values related to porsyentuhan or revenue sharing (10%). Smaller proportions (5% each) reported costs ranging from ₱1,400 to ₱100,000, reflecting substantial differences in weeding expenses depending on labor arrangements, farm size, or seasonal conditions. Overall, the findings suggest that there is no uniform cost structure, and farmers’ weeding expenditures vary considerably.

Table 33 Pesticide Spraying (Quantity)

Quantity	Frequency	Percent
Missing/Not Reported	5	25.0
0	1	5.0
1	4	20.0

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2	3	15.0
4	1	5.0
5	2	10.0
8 sprays (1 worker × 4 times × 2 seasons)	1	5.0
1,000	1	5.0
5 bottles	1	5.0
5,000	1	5.0
Total	**20**	**100.0**

The findings show that 25% of respondents did not indicate the quantity used for pesticide spraying. Among those who reported data, the most common quantity was 1 unit/application (20%), followed by 2 units (15%). Smaller proportions (5% each) reported either very low quantities (e.g., "0") or higher and variable estimates such as 8 spray cycles, 5 bottles, or large numerical values (e.g., 1,000 or 5,000). The wide spread of responses indicates substantial variability in pesticide spraying practices, likely influenced by farm size, pest pressure, and individual farming strategies.

Table 34 Total Seasonal Cost

Total Seasonal Cost	Frequency	Percent
Missing/Not Reported	4	20.0
700	1	5.0
1,000	1	5.0
1,500	1	5.0
2,500	1	5.0
2,800	1	5.0
3,000	2	10.0
5,000	2	10.0
8,000	1	5.0
10,000	1	5.0
20,000	1	5.0
Included sa 10% na kukunin ng kasama sa bukid	1	5.0
Kasama sa porsyentuhan	1	5.0
Porsyentuhan	1	5.0
"5.000.00" (invalid/unclear)	1	5.0
Total	**20**	**100.0**

Results indicate that 20% of respondents did not report their seasonal cost for pesticide spraying. Among those who provided values, costs varied widely—from as low as ₱700 up to ₱20,000 per season. The most commonly reported amounts were ₱3,000 and ₱5,000, each accounting for 10% of the sample. Several respondents also reported costs described as being part of a percentage-sharing arrangement (porsyentuhan) rather than a fixed peso amount, suggesting variation in payment systems across farms. Overall, the data reflect substantial variability in pesticide spraying expenditures, likely influenced by farm size, pest conditions, and labor arrangements.

Table 35 Quantity (Harvesting)

Quantity (Harvesting)	Frequency	Percent
Missing/Not Reported	5	25.0
1	4	20.0
1 (reaper)	1	5.0
3	1	5.0
4	1	5.0
4 workers	1	5.0
4.5	1	5.0
8	1	5.0
60	1	5.0
70 cavan	1	5.0
80 cavan (wet season)	1	5.0

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90–95 kada ektarya	1	5.0
8% harvester	1	5.0
Total	**20**	**100.0**

Results show that 25% of respondents did not specify their harvesting quantity. Among those who reported values, responses varied widely, reflecting different measurement systems (e.g., number of workers, cavans, harvester percentage, or machine type). The most frequently reported quantity was 1 unit/worker (20%). Other responses ranged from 3 to 8 workers, to harvest volumes such as 60–95 cavans, and percentage-based harvesting (e.g., 8% harvester). This wide variation suggests that farmers use diverse harvesting arrangements, influenced by farm size, available labor, and the chosen harvesting method (manual vs. mechanized).

Table 36 Total Seasonal Cost (Harvesting)

Total Seasonal Cost (Harvesting)	Frequency	Percent
Missing / Not Reported	4	20.0
1,500	1	5.0
2,250	1	5.0
4,000	1	5.0
5,000	1	5.0
14,000	1	5.0
15,000	1	5.0
20,000	1	5.0
30,000	1	5.0
35,000	1	5.0
40,000	1	5.0
500,000	1	5.0
10% of harvest (bayad sa harvester)	1	5.0
12% of ani	1	5.0
100 cav dry season	1	5.0
Depends on harvester: 11 cavans per 100 cavans	1	5.0
Depende sa presyo ng palay	1	5.0
Total	**20**	**100.0**

A total of 20% of respondents did not provide any information on harvesting costs. Among those who reported values, costs varied widely, reflecting different methods of compensation and farm scales. Some farmers reported fixed monetary payments ranging from ₱1,500 to ₱40,000, while others used percentage-based arrangements (e.g., 10% or 12% of harvest) or cavan-based payments (e.g., 11 cavans per 100 cavans harvested). One outlier reported ₱500,000, likely reflecting a large-scale operation or aggregated cost. The diversity of responses indicates that harvesting costs are highly variable and depend on the method of payment, farm size, and seasonal conditions.

- *Inputs*

Table 37 Seed Quantity

Seed Quantity	Frequency	Percent
Missing / Not Reported	5	25.0
0	1	5.0
1	1	5.0
1–2 bags per hectare	1	5.0
2	1	5.0
2 sacks	1	5.0
3	3	15.0
3 cavans	1	5.0
4 sacks	1	5.0
4.5 bags of 25 kls	1	5.0
10	1	5.0
40 kilos	1	5.0
81 kls	1	5.0
120 kls	1	5.0
Total	**20**	**100.0**

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A quarter of respondents (25%) did not report seed quantity. Among those who did, quantities varied greatly, reflecting differences in farm size and planting methods. The most frequently reported amount was 3 units (15%), while other respondents reported a mix of bags, cavans, and kilos ranging from 1–2 bags per hectare up to 120 kls. This variability shows that farmers employ different measurement systems and planting densities, highlighting the lack of a standard unit for seed quantity in the surveyed farms.

Table 38 Seed Total Seasonal Cost (PHP)

Seed Total Seasonal Cost (PHP)	Frequency	Percent
Missing / Not Reported	5	25.0
0	1	5.0
1,500	1	5.0
2,400	1	5.0
3,500	1	5.0
3,600	2	10.0
4,500	1	5.0
8,000	1	5.0
10,000	1	5.0
10,500	1	5.0
13,500	1	5.0
20,000	1	5.0
50,000 and above	1	5.0
60,000	1	5.0
100,000	1	5.0
Total	**20**	**100.0**

Twenty-five percent of respondents did not provide information on the total seasonal cost for seeds. Among those who reported, costs varied substantially, from ₱1,500 to ₱100,000, with one respondent indicating ₱50,000 and above. The most frequently reported amount was ₱3,600 (10%). This wide variation reflects differences in farm size, seed types, planting density, and purchasing methods, showing that farmers employ diverse budgeting strategies for seeds.

Table 39 Fertilizer Quantity (sacks/bags)

Quantity (sacks/bags)	Frequency	Percent
Missing / Not Reported	5	25.0
0	1	5.0
1	2	10.0
2	3	15.0
3	2	10.0
4	2	10.0
5	2	10.0
6	1	5.0
8	1	5.0
10	1	5.0
12	1	5.0
Total	**20**	**100.0**

Twenty-five percent of respondents did not report their fertilizer quantity. Among those who did, quantities ranged from 1 to 12 sacks/bags per season, with the most commonly reported quantities being 2 sacks (15%) and 1–5 sacks (10% each). The variation reflects differences in farm size, crop type, and fertilization practices. Overall, farmers exhibit diverse strategies for fertilizer application, indicating no standardized quantity across the sample.

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Table 40 Fertilizer Total Seasonal Cost (PHP)

Fertilizer Total Seasonal Cost (PHP)	Frequency	Percent
Missing / Not Reported	5	25.0
0	1	5.0
1,200	1	5.0
4,500	1	5.0
5,000	1	5.0
6,500	1	5.0
7,500	1	5.0
10,000	1	5.0
15,000	1	5.0
16,000	1	5.0
20,000	1	5.0
23,600 (2 seasons)	1	5.0
30,000	1	5.0
45,000	1	5.0
117,000	1	5.0
Government-provided (NA)	1	5.0
Total	**20**	**100.0**

Twenty-five percent of respondents did not report their fertilizer costs. Among those who provided information, costs ranged widely from ₱1,200 to ₱117,000, with one respondent indicating fertilizer was government-provided. Most costs fell between ₱4,500 and ₱30,000, reflecting different farm sizes, types of fertilizer, and seasonal requirements. The diversity of reported costs suggests that fertilizer expenditure varies considerably depending on farm scale, source of fertilizer, and management practices.

Table 41 Pesticide Quantity

Pesticide Quantity	Frequency	Percent
Missing / Not Reported	5	25.0
0	1	5.0
1	2	10.0
2	5	25.0
4 liters (2 seasons)	1	5.0
5	3	15.0
5 bottles	1	5.0
5 btls	1	5.0
5,000	1	5.0
Total	20	100.0

Twenty-five percent of respondents did not report pesticide quantity. Among those who did, the most commonly used quantity was 2 units (25%), followed by 5 units (15%). Other responses included 1 unit, 4 liters (two seasons), 5 bottles, or numerical estimates like 5,000, reflecting different measurement methods and farm practices. This suggests that pesticide application varies depending on farm size, type of pesticide, and farmer preference, with no standard quantity across the sample.

Table 42 Pesticide Total Seasonal Cost (PHP)

Pesticide Total Seasonal Cost (PHP)	Frequency	Percent
Missing / Not Reported	5	25.0
0	1	5.0
1,000	1	5.0
1,500	1	5.0
2,000	2	10.0
2,500	1	5.0
2,900	1	5.0

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3,000	1	5.0
3,200 (2 seasons)	1	5.0
4,500	2	10.0
5,000	2	10.0
8,000	1	5.0
10,000	1	5.0
Total	**20**	**100.0**

Twenty-five percent of respondents did not report total seasonal cost for pesticide. Among those who provided data, costs ranged from ₱0 to ₱10,000, with the most frequently reported costs being ₱2,000 and ₱4,500 (each 10%). Some respondents provided seasonal costs over two seasons, such as ₱3,200. The variation reflects differences in farm size, pesticide type, frequency of application, and method of purchase, indicating that pesticide expenditure is not standardized across farms.

Table 43 Gasoline Quantity

Quantity (Gasoline)	Frequency	Percent
Missing / Not Reported	6	30.0
0	1	5.0
3	1	5.0
5	1	5.0
10	1	5.0
15	1	5.0
50 L	1	5.0
60 L	1	5.0
70 L	1	5.0
300 L Diesel (2 seasons)	1	5.0
2,000	1	5.0
5,000	1	5.0
20,000	1	5.0
None	2	10.0
Total	**20**	**100.0**

Thirty percent of respondents did not provide gasoline quantity. Reported quantities varied widely, reflecting differences in fuel type, farm machinery usage, and seasonal requirements. The most common responses were “None” (10%), indicating no fuel use, and smaller quantities (3–15 L) for minor operations. Larger quantities, such as 300 L diesel or numerical values like ₱2,000–₱20,000, suggest fuel expenditures for mechanized activities. Overall, fuel use among respondents is highly variable, influenced by farm size, machinery, and operational practices.

Table 44 Gasoline Total Seasonal Cost (PHP)

Gasoline Total Seasonal Cost (PHP)	Frequency	Percent
Missing / Not Reported	6	30.0
0	1	5.0
2,750	1	5.0
3,540	1	5.0
3,500	1	5.0
5,000	3	15.0
6,000	1	5.0
13,500	1	5.0
31,600	1	5.0
50,000	1	5.0
None	2	10.0
Approx. 16,200 (Diesel price depends)	1	5.0
Total	**20**	**100.0**

Thirty percent of respondents did not report total seasonal cost for gasoline. Among those who reported, costs varied widely, ranging from ₱2,750 to ₱50,000, with ₱5,000 being the most frequently reported (15%). Two respondents reported no cost, while

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one provided an approximate cost (₱16,200) reflecting fluctuating diesel prices. The variation indicates differences in fuel consumption, machinery use, and operational scale across farms.

Table 45 Source of Capital

Source of Capital	Frequency	Percent
Missing / Not Reported	3	15.0
Borrowed Capital (Hiram na kapital)	4	20.0
Family Assistance (Tulong mula sa Pamilya)	1	5.0
Family Assistance + Borrowed Capital	1	5.0
Personal Savings (Sariling Ipon)	8	40.0
Personal Savings + Borrowed Capital	2	10.0
Personal Savings + Family Assistance + Borrowed Capital	1	5.0
Total	**20**	**100.0**

Fifteen percent of respondents did not report their source of capital. Among those who provided information, the majority relied on personal savings (40%), followed by borrowed capital alone (20%). Some respondents combined sources, such as personal savings with borrowed capital (10%) or a mix of all three sources (5%). A smaller proportion depended solely on family assistance (5%) or a combination of family assistance and borrowed capital (5%). This indicates that farmers often use multiple financing strategies, but personal savings remain the primary source of capital.

Table 46 Source of Financing

Source of Financing	Frequency	Percent
Missing / Not Reported	10	50.0
Bank and Other Financial Institution Loans	1	5.0
Bank Loans + Borrowed Capital	2	10.0
Borrowed Capital (Hiram na kapital)	2	10.0
Government Agricultural Loans	1	5.0
Government Loans + Borrowed Capital	1	5.0
Government Loans + Cooperatives	1	5.0
Personal	1	5.0
Private Person	1	5.0
Total	**20**	**100.0**

Half of the respondents (50%) did not report their source of borrowed capital. Among those who did, borrowed capital alone and combinations with bank loans were the most frequent (10% each). Other sources included government agricultural loans, either alone or combined with cooperatives or borrowed capital (15%), and personal or private loans (10%). This indicates that farmers utilize a variety of financing sources, often combining formal and informal channels to meet capital needs.

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➢ *Interpretation*

Condensed Average Cost and Revenue Component
Rice Paddy Farmers in Nueva Ecija

Cost Component		
Fixed Costs		
Land	₱	513,071.43
Farm Machinery	₱	177,311.76
Farm Equipment	₱	26,250.00
Insurance Premiums	₱	32,000.00
Other Fixed Costs	₱	25,000.00
Total Fixed Costs	**₱**	**748,633.19**
Variable Costs		
Labor		
Seedling	₱	25,487.50
Planting	₱	26,806.25
Fertilizing	₱	23,970.00
Weeding	₱	14,384.62
Pesticide Spraying	₱	5,192.31
Harvesting	₱	15,322.73
Total Labor Cost	**₱**	**111,163.40**
Material and Inputs		
Seed	₱	20,792.86
Fertilizer	₱	22,269.23
Pesticide	₱	3,821.43
Gasoline	₱	12,917.27
Others	₱	13,800.00
Total Material and Inputs Cos	**₱**	**73,600.79**
Total Variable Costs	**₱**	**184,764.19**

Fig 18 Cost and Revenue Component of Rice Paddy Farmers in Nueva Ecija

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The findings show that the fixed cossts constitute the largest portion of the farmers' overall production expenses, amounting to ₱748,633.19. Within this category, land cost represents the most substantial share at ₱513,071.43, reflecting its critical role as a primary resource in rice farming. This is followed by investments in farm machinery (₱177,311.76) and farm equipment (₱26,250.00), which together highlight the farmers' reliance on mechanization to sustain production. Meanwhile, insurance premiums (₱32,000.00) and other fixed costs (₱25,000.00) account for smaller but essential expenditures that support risk management and farm operations.

In terms of variable costs, the total amounts to ₱184,764.19, showing that day-to-day operational expenses remain significantly lower than fixed investments. Labor-related activities contribute the largest share of variable costs at ₱111,163.40. Within labor, planting (₱26,806.25) and seedling preparation (₱25,487.50) are the most cost-intensive tasks, followed by fertilizing (₱23,970.00). Activities such as weeding (₱14,384.62), harvesting (₱15,322.73), and pesticide spraying (₱5,192.31) comprise smaller portions but remain essential for crop maintenance and yield protection.

For materials and inputs, the total cost is ₱73,600.79, with fertilizer (₱22,269.23) and seed (₱20,792.86) representing the highest expenditures in this category. Additional costs include gasoline (₱12,917.27), other inputs (₱13,800.00), and pesticides (₱3,821.43), which support various stages of rice cultivation.

It is also important to note that there are respondents that do not have either/or any investments in fixed costs due to inheritance and assistance from the government and/or purchases in some items for inputs materials and payments in labor. Overall, the results indicate that fixed costs far exceed variable costs, suggesting that rice paddy farmers in Nueva Ecija invest heavily in long-term farm assets and land resources. This cost structure highlights the capital-intensive nature of rice cultivation in the region and emphasizes the need for efficient utilization of machinery and land to maximize returns on investment.

Condensed Average Income Statement
Rice Paddy Farmers in Nueva Ecija

Revenue	₱	245,637.60
Cost of Goods Sold		
Labor	₱	111,163.40
Material and Input	₱	60,683.52
Total Cost of Goods Sold	**₱**	**171,846.92**
Gross Profit	**₱**	**73,790.68**
Operating Expenses	₱	12,917.27
Total Operating Expenses	**₱**	**12,917.27**
Operating Income	₱	60,873.41
Interest Expense (6.5%)	₱	3,956.77
Earnings before Taxes	₱	56,916.64
Tax Expense	₱	11,754.55
Average Net Income	**₱**	**45,162.09**

Fig 19 Condensed Income Statement of Rice Paddy Farmers in Nueva Ecija

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The findings show that the rice paddy farmers generated an average revenue of ₱245,637.60 for the production cycle. From this amount, the total cost of goods sold (COGS) accounted for ₱171,846.92, consisting of labor costs (₱111,163.40) and material and input expenses (₱60,683.52). After deducting COGS, the farmers attained a gross profit of ₱73,790.68, indicating the remaining earnings available to cover operational and financing costs.

The analysis further shows that operating expenses, amounting to ₱12,917.27, reduce the gross profit to an operating income of ₱60,873.41. This demonstrates that the farmers retain a substantial portion of their gross earnings after accounting for administrative and farm-related overheads.

After deducting the interest expense at 6.5%, which totals ₱3,956.77, the farmers' earnings before taxes amount to ₱56,916.64. Applying the corresponding tax obligation of ₱11,754.55, the farmers achieve an average net income of ₱45,162.09 for the period which is 20.67% higher than the average net income for rice paddy farming in Nueva Ecija of ₱37,426.00 in 2022. When accounted for 3 years of inflation, this amount would result in a 15.27% increase resulting in an increase of ₱5,713.44 or a 2025 adjusted for inflation amount of ₱43,139.44.

The results indicate that despite considerable production and operating costs, rice paddy farmers in Nueva Ecija are able to maintain a positive and competitive net income level. The profitability structure suggests that efficient cost management—particularly in labor and material expenditures—plays a crucial role in sustaining their financial performance and ensuring viable farming operations.

Rice Paddy Farmers in Nueva Ecija
Profitability Ratios

Gross Profit Margin	₱73,790.98 / ₱245,637.60	x 100	
=	**30.04%**		
Operating Profit Margin	₱60,873.41 / **₱245,637.60**	x 100	
=	**24.78%**		
Net Profit Margin	₱45,162.09 / ₱245,637.60	x 100	
=	**18.39%**		
Return on Assets (ROA)	₱45,162.09 / ₱748,633.19	x 100	
=	**6.03%**		
Return on Investment (ROI)	₱45,162.09 / ₱933,397.38	x 100	
=	**4.84%**		

Fig 20 Profitability Ratios of the Average Rice Paddy Farmer in Nueva Ecija

The profitability ratios indicate the overall financial performance and efficiency of rice paddy farmers in utilizing their resources to generate income. The gross profit margin is recorded at 30.04%, which means that for every peso of revenue generated, farmers retain ₱0.30 after covering the direct costs of production. This suggests that the farmers maintain a moderately healthy production efficiency, as a substantial portion of their revenue remains after deducting labor and input expenses.

The operating profit margin stands at 24.78%, showing that after accounting for both production and operating expenses, farmers retain nearly one-fourth of their total revenue. This reflects effective management of operating expenses, enabling farmers to preserve a significant share of income before financing and tax considerations.

The net profit margin is calculated at 18.39%, indicating that after covering all expenses—including production, operating, interest, and taxes—farmers earn ₱0.18 in net income for every peso of revenue. This level of profitability demonstrates that rice paddy farming in Nueva Ecija remains financially viable, although returns may still be affected by fluctuating market prices and rising costs of inputs.

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The return on assets (ROA) is 6.03%, meaning that farmers generate approximately ₱0.06 of net income for every peso invested in total assets. This relatively modest return reflects the capital-intensive nature of rice farming, where substantial investments in land, machinery, and equipment result in lower asset-based profitability. Nonetheless, the positive ROA indicates that these assets are still contributing to overall income generation, albeit at a conservative rate.

The return on investment (ROI) for rice paddy farmers in Nueva Ecija is 4.84%, indicating that for every peso invested in fixed and variable farm resources, farmers earn approximately ₱0.048 in net income. This relatively modest return reflects the capital-intensive nature of rice farming, where substantial investments in land, machinery, and inputs yield relatively lower short-term financial gains.

Despite generating positive net income, the ROI suggests that overall profitability remains constrained by high production costs, particularly in fixed assets such as land and machinery. This highlights the need for strategies that improve cost efficiency, maximize asset utilization, and enhance yield performance to achieve higher returns in future production cycles.

Overall, the profitability ratios show that while rice paddy farmers achieve stable margins and maintain positive returns, their financial performance is closely tied to efficient cost management and optimal utilization of fixed assets, which are crucial factors in sustaining profitability in a capital-heavy agricultural sector.

Average Seasonal/Annual Rice Production 94 Cavans

Contribution Margin Price per Cavan - Variable Cost per Cavan

where: ; Price per Cavan = Average Revenue / Average Seasonal Rice Production

; Variable Cost per Cavan = Average Total Variable Costs / Average Seasonal Rice Production

Price per Cavan ₱ 245,637.60 / 94 cavans

= *₱ 2,613.17*

Variable Cost per Cavan ₱ 184,764.19 / 94 cavans

= *₱ 1,965.58*

Break-Even Point in Units ₱ 748,633.19 / ₱ 1,965.58

= 380.87 Cavans or 381 Cavans

Fig 21 Break-Even Point in Units for Rice Paddy Farmers in Nueva Ecija

The findings show that the rice paddy farmers need to produce and sell at least 381 cavans of palay in order to cover their total fixed costs and avoid losses. This means that at this production level, the farmers are able to recover expenses tied to land, farm machinery, equipment, insurance, and other fixed investments. Reaching 381 cavans represents the point at which revenue equals total costs, with neither profit nor loss incurred.

The break-even output of 381 cavans also reflects the substantial fixed capital requirements associated with rice farming in Nueva Ecija. Because a significant amount of cost is tied to long-term assets, farmers must achieve relatively high production volumes before generating positive income. Producing below this threshold results in an operating loss, while production beyond 381 cavans contributes directly to profitability.

The break-even analysis emphasizes the importance of maintaining sufficient yield levels, improving productivity, and managing fixed resources efficiently to ensure consistent financial viability within the rice farming sector.

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Contribution Margin Ratio	₱	245,637.60	less	₱ 184,764.19	x100
	₱			245,637.60	
	=	*24.78%*			
Break-Even Point in Sales Pesos	₱	748,633.19			
		24.78%			
	= ₱	**185,511.30**	**to break-even**		

Fig 22 Break-Even Point in Sales Pesos for Rice Paddy Farmers in Nueva Ecija

The findings show that the rice paddy farmers must generate at least ₱185,511.30 in sales revenue to break even. This means that at this level of income, the farmers are able to fully cover all fixed costs associated with land, machinery, equipment, insurance, and other long-term production needs. Reaching this sales threshold ensures that farmers avoid losses but do not yet realize profit.

The break-even sales figure also highlights the importance of the farmers' 24.78% contribution margin ratio, which reflects the portion of revenue available to cover fixed expenses after accounting for variable costs. Because rice farming involves substantial capital investment, a relatively high sales volume is necessary before farmers can begin earning positive returns.

The break-even analysis point in sales pesos emphasizes that maintaining adequate market prices and achieving sufficient yield levels are essential for financial sustainability. Generating revenue above ₱185,511.30 allows the farmers to move beyond the break-even point and contribute directly to profitability.

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Chapter Four
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. Summary

This study analyzed the income levels of rice paddy farmers in Nueva Ecija by examining their production costs, revenue structures, break-even points (BEP), and profitability using short-run and long-run cost functions. A total of 20 purposely selected farmers from key rice-producing municipalities in Cabanatuan City, San Jose City, Talavera, San Leonardo, Llanera, Aliaga, San Antonio, Munoz, Gabaldon, Quezon, Gen. Tinio and Jaen served as respondents. Their demographic and farm characteristics reveal significant diversity in farming practices, operational scale, and financial conditions.

The data indicate that most respondents are male with ages ranging from mature adulthood from 50 and above, reflecting the national trend wherein rice farmers are aging, and the average age is around 50 years old. Educational attainment varies from elementary to college level, the respondents are mostly high school students and farmers typically support medium sized households. Farming experience ranges widely, with some farmers cultivating rice for over two decades, while others have recently begun rice farming. Many farmers have attended training programs and have received government assistance through PhilRice, PhilMech, DA, LGU programs, or RCEF initiatives, although some still report limited access to technical support and machinery.

Most respondents operate small to medium farm sizes averaging 1-2 hectares, aligning with the profile of Filipino rice farmers nationwide. Farm ownership varies: 50% are owner-cultivators, while others fall under tenancy, leasing, or amortizing arrangements. Their farming systems range from fully manual to partially or fully mechanized operations. Mechanization includes the use of transplanters, combine harvesters, hand tractors, and mechanical dryers, although access is inconsistent across municipalities.

The cost structure of farmers shows that variable costs, particularly fuel, fertilizer, seeds, pesticides, and hired labor, make up the largest portion of production expenses. Fertilizer price volatility and fuel price increases are frequently cited as major financial burdens. Fixed costs such as machinery depreciation, land rental, and maintenance remain significant, especially for farmers operating larger areas or using privately owned equipment. Capital sources are mixed: while some depend on personal savings, others rely heavily on loans from cooperatives, private lenders, or government programs.

Revenue levels depend on yield per hectare and prevailing farmgate prices. Although Nueva Ecija is the top rice-producing province in the country, many farmers still operate near or below break-even levels. Break-even analysis reveals that farmers need to meet a minimum BEP in both peso value and kilograms of palay to recover expenses. High input costs and unstable farmgate prices especially following the Rice Tariffication Law (RTL) contribute to financial pressure. During seasons of low palay prices, many farmers struggle to reach their BEP, particularly those relying on manual labor or rainfed farming.

The analysis of rice paddy farming in Nueva Ecija reveals that production is highly capital-intensive, with fixed costs (₱748,633.19) comprising the largest portion of total expenses. Land represents the most significant fixed cost (₱513,071.43), followed by investments in farm machinery (₱177,311.76) and equipment (₱26,250.00). Smaller but essential expenditures include insurance (₱32,000.00) and other fixed costs (₱25,000.00). Variable costs (₱184,764.19) are comparatively lower, dominated by labor expenses (₱111,163.40) for activities such as planting, seedling preparation, and fertilizing. Material and input costs (₱73,600.79) are led by fertilizer and seed expenditures, supplemented by gasoline, pesticides, and other inputs. Some farmers benefit from inherited land, government assistance, or purchased inputs, affecting individual cost structures.

Revenue analysis shows that farmers generated an average of ₱245,637.60 per production cycle, resulting in a gross profit of ₱73,790.68 after accounting for labor and material costs. After operating expenses (₱12,917.27), interest (₱3,956.77), and taxes (₱11,754.55), the net income averaged ₱45,162.09, representing a 20.67% increase over 2022 levels and a 15.27% inflation-adjusted increase over three years.

Profitability ratios indicate moderate financial efficiency: a gross profit margin of 30.04%, operating profit margin of 24.78%, and net profit margin of 18.39%. Return on assets (6.03%) and return on investment (4.84%) reflect the capital-intensive nature of rice farming, emphasizing the importance of efficient utilization of land, machinery, and inputs to maximize income.

Break-even analysis shows that farmers must produce at least 381 cavans or generate ₱185,511.30 in sales to cover all costs. This underscores the need for maintaining adequate yield levels, efficient management of fixed resources, and optimized production strategies to ensure financial sustainability and profitability in rice cultivation.

Overall, the findings show that rice paddy farming in Nueva Ecija remains highly significant to agricultural productivity, but farmers continue to face challenges that limit their capacity to maximize income and achieve long-term financial sustainability.

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B. Conclusion

Based on the study's findings, several important conclusions can be drawn:

First, the income levels of rice paddy farmers in Nueva Ecija are strongly influenced by production cost behavior, yield performance, and farmgate price fluctuations. The demographic and farm profiles show that most farmers operate under conditions typical of the Philippine rice sector such as small landholdings, aging farmers, mixed access to training, and varying degrees of mechanization. These conditions create financial vulnerabilities, especially when production costs rise or when selling prices fall.

Second, both short-run and long-run cost functions play a significant role in shaping farm profitability. Short-run cost pressures such as increases in fertilizer prices, fuel costs, and labor fees directly affect farmers' ability to manage operational expenses within a cropping season. Long-run costs and decisions regarding land investment, machinery acquisition, and irrigation access determine whether farmers can improve efficiency and reduce production costs over multiple seasons. Farmers with access to mechanization and modern technologies show improved long-run profitability, confirming the positive impact of machinery adoption.

Third, breakeven point results indicate that many farmers remain financially at risk. Reaching the BEP requires favorable yields and stable farmgate prices, but these conditions are not guaranteed due to market volatility, climate variability, and the effects of rice importation under Rice Tariffication Law (RTL). In difficult seasons, some farmers fail to recover their costs, resulting in minimal or negative net income. This supports the conclusion that rice farming in Nueva Ecija, although viable, is financially unstable without strong risk management and institutional support.

Fourth, profitability analysis reveals that income disparities exist among rice farmers. Farmers with larger farm sizes, access to capital, and mechanization achieve better profit margins and higher returns on investment. Meanwhile, smallholder farmers, who constitute the majority, face limited economies of scale, making their cost per hectare significantly higher. This reinforces the need for sustained financial assistance, cooperative strengthening, and technology access to ensure inclusive growth in the rice farming sector

Lastly, the study concludes that rice farming remains essential to the livelihoods of farmers in Nueva Ecija, but profitability is constrained by rising costs, unstable prices, limited resources, and external risks. For income levels to improve, farmers must adopt efficient practices, while government institutions must reinforce support programs to stabilize production costs and market returns.

C. Recommendations

Based on the study's findings, several important conclusions can be drawn:

First, the income levels of rice paddy farmers in Nueva Ecija are strongly influenced by production cost behavior, yield performance, and farmgate price fluctuations. The demographic and farm profiles show that most farmers operate under conditions typical of the Philippine rice sector such as small landholdings, aging farmers, mixed access to training, and varying degrees of mechanization. These conditions create financial vulnerabilities, especially when production costs rise or when selling prices fall.

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APPENDICES
APPENDIX A.
CONCEPT PAPER

Name	Proposed Title	Rationale	Statement of the Problem (SOP)	Research Design	Respondents/participants	Data Gathering Tools And techniques	Statistical tools or methods of analysis	Ethical considerations
Maricar N. Begino	Optimizing Operational Cost Efficiency: A Study on Modern Inventory Management Techniques in Nueva Ecija's Agri-Business Sector	Efficient inventory management is essential for minimizing costs and maximizing profitability in business. Different techniques can have varying impacts on a business' financial performance	The study aims to evaluate the influence of various inventory management techniques on cost efficiency in Agri-Businesses. Specifically, the study aims to: 1. Determine the socio-demographic characteristics o f the respondents in terms of: 1.1 Age 1.2 Gender 1.3 Experience 1.4 Primary Occupation 1.5 Location 2. To identify the inventory management techniques used by the Agri-business. 3. How these techniques affect inventory holding costs, stockout rates, and overall operational efficiency 4. Formulate recommendations for Agri-Businesses to optimize their inventory practices	A quantitative, correlational research design would be suitable for this study. Data on the adoption rates of various modern inventory management techniques within Nueva Ecija's agri-businesses would be collected	Agri-business owners. Agri-business' inventory/operations/financial/general managers	Questionnaires administered to owners or managers of Agri-Businesses in Nueva Ecija	Descriptive statistics, correlation analysis, and regression analysis	Researchers must obtain informed consent from all participating agri-businesses. This requires providing a clear and comprehensive explanation of the study's purpose, procedures, potential risks and benefits, and the participants' right to withdraw at any time without penalty. Protecting the confidentiality of the participating agri-businesses' data is paramount. Data should be anonymized whenever possible
Mikee A. Antonio	**Cross-Benefit Analysis of Artificial Insemination Services for Dairy Farmers in Nueva Ecija**	Artificial Insemination (AI) is a government-supported intervention to improve the genetic quality and productivity of carabaos. In Nueva Ecija, AI services are provided either free of charge by Philippine Carabao Center (PCC) technicians or for a fee by Village-Based AI Technicians (VBAITs), who were trained by PCC and rely on AI as their livelihood. While the semen is produced for free at the National Bull Farm in Carranglan, Nueva Ecija, adoption among farmers remains inconsistent due to cost, accessibility, and perceived risks. Conducting a cost-benefit analysis will determine whether AI adoption leads to long-term profitability for smallholder carabao farmers, while also evaluating the sustainability of the	**1. What are the costs incurred by farmers in availing AI services (PCC vs. VBAIT)?** 1.1 Type of service provider (PCC vs. VBAIT) 1.2 AI service fee (Per Insemination) 1.3 Transportation cost (farmer going to technician / technician going to farmer) 1.4 Additional farm costs (e.g., feed supplements for pregnant/lactating carabaos) 1.5 Opportunity cost (e.g., labor lost while waiting/assisting AI) **2. What are the measurable benefits of AI in terms of calf value, milk yield, and meat productivity?** **2.1 Calf Value** 2.1.1 Survival rate of calves 2.1.2 Market price of calf (crossbred vs. native) 2.1.3 Growth rate/weight gain of calf **2.2 Milk Yield** 2.2.1 Average liters of milk per day 2.2.2 Duration of lactation period 2.2.3 Market value of milk produced **2.3 Meat Productivity** 2.3.1 Liveweight at maturity (kg) 2.3.2 Market price of slaughter animal 2.3.3 Dressing percentage / carcass weight **3. At what point does AI adoption**	descriptive-comparative design complemented by cost-benefit analysis (CBA) and break-even analysis It will compare farmer-level profitability outcomes between free PCC-provided AI services and paid VBAIT-provided AI services.	Carabao farmers in Nueva Ecija who have availed AI services PCC-employed AI technicians Village-Based AI Technicians (VBAITs) trained by PCC PCC and National Bull Farm officials (for secondary data and official records)	Survey questionnaire for farmers (to capture costs, productivity changes, and adoption challenges) Key informant interviews (KIIs) with PCC technicians, VBAITs, and PCC officials Document and record analysis (PCC reports, DA livestock statistics, National Bull Farm production and distribution records)	Descriptive statistics (frequency, mean, percentages) for farmer demographics, adoption patterns, and cost structures Cost-Benefit Analysis (CBA) to assess financial returns (milk yield, calf value, meat production) versus costs (service fees, opportunity costs, time) Break-even analysis to determine the point at which AI adoption becomes profitable for smallholder farmers	Informed consent will be obtained from all farmer-respondents and technicians prior to data collection. Confidentiality of respondents' identities and farm-related data will be strictly maintained. Participation will be voluntary, with the right to withdraw at any stage of the study. Findings will be used solely for academic purposes and may be shared transparently with stakeholders, including PCC and farmer groups, upon request.

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		VBAIT livelihood system.	**break even and become profitable for smallholder farmers?** 3.1 Total AI-related costs (service + support costs) 3.2 Total revenue from AI offspring (milk, meat, calf sale) 3.3 Number of years/months until break-even 3.4 Profit margin per AI-bred animal **4. How do government subsidies (free semen and VBAIT training) influence the cost-benefit outcome?** 4.1 Cost savings from free semen provision 4.2 Cost savings from government-trained VBAITs (vs. private AI providers) 4.3 Farmer perception of subsidy effectiveness (high/medium/low) 4.4 Dependency on subsidies vs. self-sustaining AI system 5. What challenges hinder farmers from adopting AI? 5.1 Accessibility of AI services (distance, availability of technicians) 5.2 Cost concerns (service fees, hidden costs) 5.3 Perceived risk (AI failure rate, repeat services needed) 5.4 Knowledge and awareness (farmer understanding of AI benefits) 5.5 Cultural or traditional preference (natural mating vs. AI) 5.6 Trust in technicians (skills, experience, credibility)					
Jake Ernan S. Alquiroz	**Evaluation Of Demand Forecasting Practices Among Cabanatuan City Retailers: Basis for Strategic Plan**	Retailers must anticipate customer needs accurately to manage inventory, optimize operations, and maintain customer satisfaction. Despite its importance, many small to medium-sized retailers—especially in local economies such as Cabanatuan City—may not be utilizing systematic or data-driven forecasting methods. Instead, they often rely on intuition, past experiences, or outdated practices, which can lead to overstocking, stockouts, lost sales, and operational inefficiencies. Cabanatuan City, being a rapidly urbanizing economic hub in Nueva Ecija, has witnessed the proliferation of retail businesses catering to a growing and diverse population. However, it remains unclear how retailers in this area approach demand forecasting, what tools or methods they use, and what challenges they face in doing so. Understanding these practices is vital not only for individual business growth but also for the sustainable development of the city's retail sector.	This study aims to evaluate the demand forecasting practices among retailers in Cabanatuan City to serve as the basis for a strategic plan that will improve forecasting accuracy and overall business performance. Specifically, the study seeks to answer the following questions: 1. **To describe the business profile of the respondents in terms of:** 1.1. Number of Employees 1.2. Number of Years in Business 1.3. Business Capital 2. **To describe the current demand forecasting practices of Cabanatuan City retailers in terms of:** 2.1. Forecasting techniques used (qualitative or quantitative) 2.2. Use of technology and tools in forecasting 2.3. Frequency and time horizon of forecasting 3. **To determine the impact of demand forecasting practices on business performance in terms of:** 3.1. Inventory Management 3.2. Operational Cost 3.3. Customer Satisfaction 3.4. Sales and Revenue Performance 4. **To propose a strategic plan based on the results of the study.** By identifying gaps, limitations, and best practices, the research will provide a foundation for a strategic plan that local businesses can adopt to enhance their forecasting capabilities. Improved forecasting will enable better inventory control, reduced operational costs, and increased responsiveness to market changes.	This study employs a descriptive research design because its primary aim is to systematically describe the current demand forecasting practices among retailers in Cabanatuan City. It seeks to observe and document how retailers forecast demand without manipulating any variables or testing cause-and-effect relationships. Descriptive research allows for the collection of both quantitative and qualitative data, providing a comprehensive understanding of existing methods, challenges, and their impact on business performance. This approach serves as a solid foundation for developing a strategic plan tailored to improve forecasting practices based on real-world conditions.	The respondents of this study will be retail business owners or managers operating in Cabanatuan City. They are selected because they are directly involved in or responsible for demand forecasting and inventory management within their establishments. A representative sample of small to medium-sized retailers from various sectors will be chosen to provide diverse insights into the current forecasting practices, challenges, and impacts on business operations.	This study will utilize a structured questionnaire as the primary data gathering tool to collect quantitative information on demand forecasting practices, business profiles, and their impact. The questionnaire will include both closed-ended and Likert-scale questions to capture measurable data. Additionally, key informant interviews may be conducted with selected retailers to gain qualitative insights into the challenges and decision-making processes related to demand forecasting. Data will be gathered through face-to-face distribution or online platforms, ensuring convenience and wider reach. The collected data will then be analyzed using statistical tools to identify trends and patterns relevant to the study objectives.	The data collected from the questionnaires will be analyzed using descriptive statistics such as frequency counts, percentages, means, and standard deviations to summarize and describe the demand forecasting practices and business profiles of the respondents. Cross-tabulation may be used to explore relationships between variables such as business size and forecasting methods. Qualitative data from interviews will be analyzed to identify common themes and insights related to challenges and best practices.	This study will ensure the confidentiality and anonymity of all respondents by not disclosing any personal or business-identifying information. Participation will be voluntary, and respondents will be fully informed about the purpose of the study, how the data will be used, and their right to withdraw at any time without any penalty. Informed consent will be obtained prior to data collection. The data gathered will be used solely for research purposes and stored securely to prevent unauthorized access. The study will also respect intellectual property and give proper credit to all sources and participants involved.

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Gia Vanessa Balanza	The Effects of Government-Supplied Agricultural Inputs on the Productivity and Livelihood of Rice Farmers in Nueva Ecija	Nueva Ecija, known as the "Rice Granary of the Philippines," is one of the country's top rice-producing provinces. To support farmers and sustain food security, the government provides agricultural inputs such as certified seeds, fertilizers, pesticides, irrigation support, and farm machinery through programs of the Department of Agriculture (DA) and the National Food Authority (NFA). These supplies aim to reduce farmers' costs, improve productivity, and ensure stable rice production. However, questions remain on how effective these interventions are, whether they truly help farmers improve their livelihood, or if they create dependency. This study seeks to examine the actual effects of government-supplied inputs on the productivity, income, and sustainability of rice farming in Nueva Ecija.	This study aims to assess the impact of government-supplied agricultural inputs on rice farmers in Nueva Ecija. Specifically, it seeks to answer the following: 1. What types of government-supplied inputs (e.g., seeds, fertilizers, pesticides, machinery) are commonly received by rice farmers? a. Inputs received (seeds, fertilizers, pesticides, machinery, irrigation). b. Frequency of distribution. c. Sufficiency of supply d. Quality of inputs. 2. How do these government supplies affect rice productivity and yield per hectare? a. Changes in yield after receiving inputs. b. Increase/decrease in yield (e.g., cavans/hectare). c. Most helpful input in improving yield. d. Timeliness of distribution. e. Comparison with self-procured inputs. 3. What are the perceived effects of these supplies on farmers' income and overall livelihood? a. Changes in income after receiving inputs. b. Savings from reduced farming costs. c. Impact on household finances and well-being. d. Security in continuing rice farming. 4. What challenges do farmers encounter in accessing and utilizing government supplies? a. Delays in receiving supplies. b. Insufficient or late distribution. c. Issues on fairness and equal access.	descriptive research design with a mixed-methods approach. Quantitative data will be collected through surveys of farmers to measure productivity and income effects, while qualitative data will be gathered through interviews and focus group discussions to explore farmers' experiences and perceptions.	Rice farmers who are beneficiaries of government agricultural supply programs in Nueva Ecija Key officials from DA, NFA, and local government agriculture offices Leaders of farmer cooperatives and associations	Survey questionnaires for rice farmers (to assess type of supplies received, yield improvement, cost reduction, and income changes) Key Informant Interviews (KIIs) with government officials and cooperative leaders Focus Group Discussions (FGDs) with groups of farmers to gather shared experiences and insights Secondary data from DA and NFA reports for validation	Descriptive statistics (mean, percentage, frequency) to summarize survey results Comparative analysis to compare productivity and income of farmers with and without government support Thematic analysis for qualitative data from interviews and FGDs	Informed consent will be obtained from all participants before data collection. The confidentiality and anonymity of respondents will be respected. Participation will be voluntary, with the right to withdraw at any time. The results of the study will be reported honestly and used solely for academic and developmental purposes.

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			d. Problems in claiming/distribution process. e. Difficulties in using inputs (e.g., lack of training, poor quality). 5. What recommendations can be made to improve government support programs for rice farmers in Nueva Ecija? a. Suggestions to improve distribution. b. Need for training along with inputs. c. Additional support needed (credit, market, insurance). d. Ensuring fairness and equal allocation. e. Promoting farmer self-reliance and sustainability.					
Jhosalyn V. Bauat	**Assessment of Employees' Perspectives on Provincial Minimum Wage and Its Effect on Their Standard of Living in Nueva Ecija**	The issue of minimum wage remains one of the most debated topics in labor and economics. While the government sets minimum wage standards to protect workers, there is a growing concern that the provincial rate may not be enough to sustain a decent standard of living, especially with the rising costs of basic goods and services. Employees are often the most affected, as their income directly impacts their ability to meet daily needs, support their families, and maintain quality of life. This study focuses on private employees in Nueva Ecija to determine their perspectives on the provincial minimum wage and how it affects their standard of living. The findings will provide valuable insights for policymakers, employers, and future researchers in addressing wage adequacy and employee welfare.	This study aims to assess employees' perspectives on the provincial minimum wage and its effect on their standard of living. Specifically, it seeks to answer the following questions: 1. What are the demographic profiles of private employees in Nueva Ecija in terms of: 1.1 Age 1.2 Gender 1.3 Civil Status 1.4 Educational Attainment 1.5 Employment Status (Regular/Contractual) 1.6 Monthly Income 2. What are the employees' perspectives on the adequacy of the provincial minimum wage in relation to: 2.1 Basic needs (food, shelter, clothing) 2.2 Health and education expenses 2.3 Savings and financial security 2.4 Quality of life and well-being 3. How do employees perceive the challenges and coping strategies associated with living on the minimum wage in Nueva Ecija? 4. Is there a significant relationship between the employees' demographic profile and their perspectives on the minimum wage?	This study will use a descriptive-quantitative research design with survey questionnaires as the primary tool. A descriptive approach is appropriate as it aims to gather and analyze employees' views regarding minimum wage and its effects on their standard of living.	The respondents will be private employees in Nueva Ecija who are currently earning the provincial minimum wage. The study will use purposive sampling, focusing on individuals directly affected by minimum wage policies.	Survey Questionnaire – structured questions with Likert scale items to measure employees' perspectives on wage adequacy and living conditions.	Frequency and Percentage – to describe the demographic profile of respondents. Weighted Mean – to assess employees' perspectives on minimum wage adequacy.	This study will follow basic ethical guidelines to protect the respondents. Participation will be voluntary, and the purpose of the study will be explained before they answer the survey. Respondents will be asked for their consent, and they may choose to stop at any time. All answers will be kept private and used only for academic purposes. No personal details will be shared, and the identity of the participants will remain anonymous. Throughout the study, respect, honesty, and fairness will be observed to make sure the welfare of the respondents is given importance.

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Luz Clarita A. Ansels	**Economic Evaluation of Solar-Powered Irrigation Systems and Their Managerial Implications for Rice Farmers in Nueva Ecija**	Nueva Ecija, as the leading rice-producing province in the Philippines, faces increasing challenges in irrigation due to rising fuel costs, climate variability, and limited access to sustainable technologies. Solar-powered irrigation systems offer a promising alternative that can reduce operational costs and improve farm productivity. However, adoption remains low due to economic constraints and lack of managerial insight. This study aims to evaluate the economic viability of solar-powered irrigation and its impact on managerial decision-making among rice farmers in Nueva Ecija. By applying principles of managerial economics, the research will help identify cost-effective strategies and guide farmers in optimizing resource allocation, improving profitability, and enhancing resilience to environmental and market risks.	Specifically, the study aims to: 1. Determine the socio-demographic characteristics of the respondents in terms of: 1.1 Age 1.2 Gender 1.3 Educational Attainment 1.4 Years of Farming Experience 1.5 Farm Size and Location 2. Identify the types of irrigation systems used by rice farmers, with emphasis on: 2.1 Traditional diesel-powered systems 2.2 Electric-powered systems 2.3 Solar-powered irrigation systems 3. Analyze the economic incentives and constraints influencing the adoption of solar-powered irrigation, including: 3.1 Initial investment cost and financing options 3.2 Operating and maintenance costs 3.3 Government subsidies or support programs 3.4 Environmental and sustainability considerations 4. Evaluate the impact of solar-powered irrigation on managerial decision-making in terms of: 4.1 Cost efficiency and input optimization 4.2 Labor allocation and productivity 4.3 Risk management and seasonal planning 5. Assess the short-term and long-term economic effects of solar irrigation adoption on: 5.1 Farm profitability and yield 5.2 Income stability and resilience to climate variability 5.3 Local competitiveness and technology diffusion	This study will utilize a qualitative research design, specifically a descriptive and exploratory approach. It aims to understand the economic and managerial implications of using solar-powered versus traditional irrigation systems among rice farmers in Nueva Ecija. The qualitative design allows for in-depth exploration of farmer experiences, perceptions, and decision-making processes.	The participants of the study will be rice farmers in Nueva Ecija who are currently using either: Solar-powered irrigation systems, or Traditional irrigation systems (diesel or electric-powered) A purposive sampling technique will be employed to select respondents who have direct experience in managing irrigation systems and making farm-level economic decisions.	Survey Questionnaire and Semi-structured interviews to gather detailed insights into farmers' decision-making processes, cost considerations, and experiences with irrigation systems.	Since the study uses a qualitative approach, the following analytical methods will be applied: Content analysis to systematically categorize and interpret responses from interviews Thematic analysis to identify recurring patterns and themes related to economic decision-making and irrigation practices. Cross-case analysis to compare insights between farmers using solar-powered and traditional irrigation systems.	Researchers must obtain informed consent from all participating farmers. This involves providing a clear explanation of the study's purpose, procedures, potential risks and benefits, and the participants' right to withdraw at any time without penalty. Protecting the confidentiality of the participants' data is essential. All personal and farm-related information will be anonymized whenever possible, and data will be stored securely to prevent unauthorized access. The study will ensure voluntary participation, avoid any form of coercion, and respect the cultural and social context of the farming communities in Nueva Ecija.
Xyran Aerielle S. Alejandro	**Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines: A Break-Even Point (BEP) and Profitability Analysis through Short-Run and Long-Run Cost Function**	This study seeks to examine the income level of rice paddy farmers in Nueva Ecija by identifying their break-even point (BEP) and evaluating profitability through short-run and long-run cost functions. Nueva Ecija, often called the "Rice Granary of the Philippines," plays a vital role in national food security, yet many	This study aims to determine and explore the different income levels of rice paddy farmers in Nueva Ecija by analyzing the costs of production, both in the short run and long run, thereby providing a break-even point and profitability analysis to assess their financial sustainability and guide strategies for improving farm efficiency. Specifically, the study will aim to: 1. Describe the profile of the rice paddy farmer in terms of: 1.1 Socio-Demographic Characteristics 1.2 Farm and Economic	The proposed study will be utilizing a mixed methods research design involving collecting and analyzing both quantitative and qualitative research design.	Rice paddy farmers in Nueva Ecija at different three different income levels: 1) low 2) middle 3) high *(if available)*	Paper and pencil survey questionnaire Semi-structured interview guide	**Descriptive & Preliminary Analysis** to summarize farmers' characteristics, yield, costs, and prices and compare income across municipalities or farm sizes **Break-even point (BEP) and cost-volume-profit (CVP) analysis**	Consent, confidentiality and private data disclosure that may affect the well-being of the respondents. Sensitive financial information on the farmer's records to financial statements. To address

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		smallholders continue to face volatile production costs, fluctuating market prices, and uncertain returns. By quantifying the BEP and modeling cost behavior over different time horizons at different levels of income, the research provides a clear picture of how farmers can cover costs, optimize resource use, and achieve sustainable profits. The results of said research aim to guide farmers in better financial planning, inform local policymakers on support programs, and contribute to broader efforts to enhance the economic resilience of the country's rice sector.	Characteristics 1.3 Production Practices 2. Cost and Revenue Structure of the Paddy Field 3. Breakeven point analysis 3.1 Per kilo of rice 3.2 In pesos 4. Production Costs 4.1 Variable Costs 4.2 Fixed Costs 5. Socioeconomic and farm-related factors and other determinants of income and profitability 6. Propose a strategic financial plan based on the results of the study				**Profitability analysis** to determine financial ratios and return on investment (ROI) **Short-Run & Long-Run Cost Functions** to determine most efficient and effective way of mixing dependent and independent variables to improve income levels for rice paddy farmers	issues, the researcher ensures that they will: 1. Informed consent. 2. Practice nondisclosure of private information. 3. Practice Republic Act 10173 or the Data Privacy Act of 2012. 4. Usage from gathered data will be used for research purposes only. 5.Observe anonymity.
Kristel Sitchon	**HR's Role in Mitigating Overstaffing Costs: A Diminishing Returns Approach to Workforce Planning**	Human Resource Management plays a vital role in yearly workforce planning to ensure that staffing levels match organizational needs. Through this process, HR determines whether to hire additional staff, create new positions, or adjust existing roles. However, when staffing exceeds actual requirements, organizations face overstaffing costs, where labor expenses rise but productivity gains diminish. This reflects the law of diminishing returns, which shows that adding more employees beyond the optimal level does not always lead to proportional increases in output.	1. What is the socio-demographic profile of the respondents in terms of: 1.1 Age 1.2 Gender 1.3 Highest Educational Attainment 1.4 Employment Type / Contract Status 1.5 Tenure with the Organization 1.6 Position Level / Job Grade 1.7 Department / Functional Area 1.8 Monthly Salary Range 1.9 Years in Current Role 1.10 Union Membership / Collective Bargaining Coverage 1.11 Work Location / Site 1.12 Household Dependents 2. How does the yearly workforce plan guide HR in determining the need for additional staff and new position creation? 3. In what ways does overstaffing contribute to diminishing returns in organizational productivity and cost efficiency? 4. What role does HR play in applying cost estimation theory to prevent inefficiencies in staffing decisions? 5. How can HR integrate authorized causes of	This study will use a **descriptive-correlational survey design** to gather data from employees on their socio-demographic profile and perceptions about overstaffing, diminishing returns, and workforce planning. A questionnaire will be the main tool for data collection. To deepen the findings, key informant interviews (KII) with HR managers and supervisors will also be conducted. This will provide insights on how staffing decisions, redundancy, and retrenchment are applied in actual practice.	The respondents of this study will consist of two groups. First, employees (rank-and-file and supervisors) who will provide data through a survey on their socio-demographic profile and perceptions of overstaffing, productivity, and workforce planning. Second, HR managers/officers and department heads who will serve as key informants through interviews to share insights on workforce planning, staff allocation, and the application of authorized causes of	This study will use a survey questionnaire for employees to collect their socio-demographic profile and perceptions on overstaffing and productivity. In addition, a key informant interview guide will be used for HR managers and department heads to gain deeper insights on workforce planning, staffing decisions, and retrenchment practices. These tools ensure both quantitative and qualitative data are	This study will adopt a descriptive-correlational survey design, using a questionnaire to gather employees' socio-demographic profiles and perceptions on overstaffing and productivity. To complement this, key informant interviews with HR managers and department heads will provide deeper insights into workforce planning, staffing decisions, and retrenchment practices. Quantitative data will be analyzed using t-tests and ANOVA	This study will be conducted with the approval and endorsement of the school administration, which requires the participation of selected employees. While participation is not optional, respondents will be assured that their privacy and confidentiality will be protected at all times. Survey and interview data will be reported in aggregate form only, with no individual names or identities disclosed. The information gathered will be used solely for academic and research purposes, and the researcher will ensure respectful treatment of all respondents throughout the

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		By applying cost estimation and diminishing returns in workforce planning, HR can make evidence-based decisions on staffing. This includes preventing unnecessary hiring, justifying the creation of new positions, and ensuring compliance with authorized causes of termination such as redundancy and retrenchment when staff reductions are necessary. In this way, HR helps balance organizational sustainability with employee welfare while avoiding the financial risks of overstaffing.	termination (e.g., redundancy and retrenchment) in addressing overstaffing? 6. What HR-driven strategies can be recommended to balance organizational viability and employee welfare in workforce planning?	By combining surveys and interviews, the study will capture both the general patterns from employees and the practical perspectives of HR, giving a clearer picture of how overstaffing costs can be mitigated.	termination. This study is best conducted in medium to large private colleges in Cabanatuan City with an estimated 200–300 employees. Possible institutions include 1. Araullo University (PHINMA), 2. Wesleyan University Philippines, 3. College of the Immaculate Conception (CIC), and; 4. Good Samaritan Colleges. These schools are ideal because they regularly prepare workforce plans, employ both teaching and non-teaching staff, and are more likely to encounter	obtained.	to compare cost and productivity across groups, while Marginal Product vs. Labor Cost analysis will be applied to determine optimal staffing levels in relation to the law of diminishing returns.	process.
					issues of staffing balance, redundancy, and retrenchment.			
Joyce Ann Alcantara	Demand Forecasting in E-Commerce: A Managerial Economics Approach for Online Sellers on Shopee and Lazada	Demand forecasting is a vital function of managerial economics that enables businesses to anticipate future consumer demand, optimize inventory, and plan strategic decisions. In the context of e-commerce platforms such as Shopee and Lazada, accurate demand forecasting becomes even more critical due to fluctuating consumer preferences, promotional events, and dynamic market competition. Sellers who can anticipate demand effectively are able to minimize	Specifically, the study aims to: 1. Determine the socio-demographic characteristics of online sellers in terms of: 1.1 Age 1.2 Gender 1.3 Educational Attainment 1.4 Years of Selling Experience 1.5 Type of Products Sold 2. Identify the current demand forecasting practices utilized by Shopee and Lazada sellers, with emphasis on: 2.1 Intuitive or experience-based forecasting methods 2.2 Sales trend analysis and historical data usage 2.3 Use of digital	The study will employ a mixed-methods research design. Quantitative analysis will focus on survey data regarding consumer purchasing patterns and frequency of online transactions. Qualitative insights will be gathered from interviews with selected online sellers to understand their challenges and practices in demand	The respondents will include online sellers operating on Shopee and Lazada, particularly SMEs engaged in fast-moving consumer goods, fashion, and electronics. Additional inputs may be gathered from frequent online shoppers to validate purchasing trends from the consumer	Data will be collected using structured questionnaires, online surveys, and semi-structured interviews. The instruments will focus on sellers' demand forecasting practices, sales data fluctuations during promotions, seasonal demand shifts, and consumer buying behaviors. Secondary sources such	Descriptive statistics will be employed to summarize consumer purchasing patterns. Inferential tools, such as time-series analysis and regression analysis, will be considered to project future demand trends. Correlation analysis may also be used to examine the relationship between pricing strategies, promotions, and consumer demand.	All participants will be informed of the purpose of the study, and their consent will be obtained prior to data collection. Confidentiality and anonymity of seller and consumer responses will be strictly maintained. The study will comply with ethical guidelines for research by ensuring transparency, data privacy, and proper acknowledgment of all secondary sources.

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		stockouts, reduce excess inventory, and align pricing strategies with market trends. As online platforms continue to expand their reach, small and medium enterprises (SMEs) face the challenge of balancing operational efficiency with customer satisfaction. This study explores how managerial economics, particularly demand forecasting techniques, can support online sellers in Shopee and Lazada to improve decision-making and sustain competitive advantage.	tools, applications, or platform-provided analytics 2.4 Reliance on seasonal events and promotional campaigns (e.g., 11.11, 12.12 sales) 3. Analyze the factors influencing the accuracy of demand forecasting among online sellers, including: 3.1 Consumer purchasing behavior and preferences 3.2 Pricing strategies and promotional offers 3.3 Competitor actions and market saturation 3.4 Supply chain reliability and product availability 4. Evaluate the impact of demand forecasting on managerial decision-making in terms of: 4.1 Inventory management and stock control 4.2 Pricing and promotional planning 4.3 Resource allocation and cost efficiency 4.4 Customer satisfaction and service quality 5. Assess the economic benefits and challenges of implementing demand forecasting strategies for online sellers, focusing on: 5.1 Sales performance and revenue growth 5.2 Profitability and cost reduction 5.3 Business scalability and competitiveness 5.4 Long-term sustainability in the digital marketplace	forecasting. Together, these approaches will demonstrate the applicability of managerial economics tools in addressing real-world e-commerce concerns.	perspective.	as industry reports, academic journals, and e-commerce trend analyses will also be consulted.		

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APPENDIX B
INFORMED CONSENT FORM

Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines: A Break-Even Point (BEP) and Profitability Analysis through Short-Run and Long-Run Cost Function

MARIETTA J. ABLAZA, Ph.D.

Nueva Ecija University of Science and TechnologyGraduate School (NEUST - GS)

Master of Business Administration (MBA)

➢ *Purpose of the Study*

You are being invited to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what your participation will involve. Please read the following information carefully and feel free to ask the researcher if there is anything that is not clear or if you need more information.

The purpose of the study is to know how much rice farmers in Nueva Ecija are earning and to find out if their income is enough to cover their expenses in farming. This study will also look at whether farming is profitable for them in the short term (one cropping season) and in the long term (several years). The information you will share will help us better understand the real situation of farmers like you, so that future programs and support for farmers can be improved.

➢ *Study Procedures*

You will first be asked to read the informed consent form, and the researchers will assist you if further understanding is needed. Once you have decided to participate, you will be asked to fill out the consent form, followed by answering the two-part survey questionnaire, which includes your demographic profile, rice paddy farm characteristics, and the overview of its costs and revenue structure.

➢ *Duration*

The time commitment for orientation regarding the study, reading and answering the informed consent form and survey questionnaire will be approximately 10-15 minutes.

➢ *Voluntary Participation*

Your participation in this study is voluntary. It is up to you whether or not you decide to participate. If you decide to participate, you will be asked to sign this consent form. After you sign this consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be destroyed.

➢ *Benefits*

There will be no direct benefit to your participation in the study. However, we hope that the gathered information from this study will help the rice farming industry and its members not only in Nueva Ecija, but also at the regional and national levels.

➢ *Confidentiality*

Your responses in this research will be anonymous. Every effort will be made by the researcher to preserve your confidentiality, including the following:

- Assigning codes/pseudonyms for participants that will be used on all research notes and documents if they chose to include their names in the survey questionnaire;
- Keeping notes, survey questionnaires, and any other personal identifiers in a location that only the researchers will have access to;
- For documents accessible through the Internet, only the researchers have link access;
- In the event of data breach, data for that respondent will be destroyed and no longer be used for the research.

➢ *Contact Information*

This study was approved by the Principal Investigator for MBA 233 Managerial Economics in Nueva Ecija University of Science and Technology - Graduate School. If you have any questions at any time about this study, or if you experience any non-normative sensations as a result of participation, you may contact the researcher whose contact information is on the first page. If

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you have any questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the Principal Investigator, please feel free to contact Dr. Marietta J. Abalza., at mariettajablaza@gmail.com.

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APPENDIX C
CONSENT FORM

I have read the provided information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I understand that I will be given a copy of this form, and the researcher will keep another copy on file. I consent voluntarily to be a participant in this study.

(Nabasa ko na ang ibinigay na impormasyon, o ito ay naipabasa na sa akin. Nagkaroon ako ng pagkakataong magtanong hinggil dito at ang lahat ng aking mga katanungan ay nasagot nang aking ikinasiya. Nauunawaan ko na bibigyan ako ng kopya ng form na ito, at ang mananaliksik ay magtatago ng isa pang kopya para sa talaan. Kusang-loob akong pumapayag na maging kalahok sa pag-aaral na ito.)

Agrees to answer the questionnaire

Disagrees due to valid reasons

Printed Name of Participant: _____
Signature of Participant: _____
Date: _____
(Day/month/year)

Printed Name of Researcher: _____
Signature of Researcher: _____
Date: _____
(Day/month/year)

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APPENDIX D
RESEARCH INSTRUMENTS

Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines:

A Break-Even Point (BEP) and Profitability Analysis through

Short-Run and Long-Run Cost Function

PROFILE OF THE RESPONDENT *(PROFAYL NG RESPONDANTE)*

Directions: Fill out the following requested information.

*(**Panuto:** Punan ang mga sumusunod na hinihinging impormasyon.)*

Name (Optional) *(Pangalan (Opsyonal)* **: _____**

Address *(Tirahan)* **: _____**

Contact Number *(Numero ng Kontak)* **: _____**

➢ *Part I. Socio-Demographic Profile (Unang Bahagi. Sosyo-Demograpikong Profayl*

- Directions: Please indicate your response by placing a check mark ☑ in the box corresponding to your selected answer. For items requiring specific information, kindly provide your response in the space allotted.

(Panuto: Mangyaring ipahiwatig ang inyong sagot sa pamamagitan ng paglalagay ng tsek ☑ sa kahong tumutugon sa inyong napiling kasagutan. Para sa mga aytem na nangangailangan ng tiyak na impormasyon, mangyaring isulat ang inyong sagot sa nakalaang espasyo.)

- *Sex (Kasarian)*

✓ Male *(Lalaki)*
✓ Female *(Babae)*

- *Age (Edad)*

✓ Adolescence *(Kabataan)* - 12-20
✓ Early Adulthood *(Di-gaanong nakatatanda)* - 21-35
✓ Midlife *(Katamtamang gulang)* - 36-50
✓ Mature Adulthood *(Nakatatanda)* - 50 above

- *Highest Educational Attainment (Pinakamataas na Natamong Edukasyon)*

✓ Elementary *(Elementarya)*
✓ High school *(Hayskul)*
✓ College *(Kolehiyo)*
✓ Postgraduate *(Gradwadong Pag-aaral)*
✓ Others, please specify *(Iba pa, pakitukoy):* _____

- *Household Size (Bilang ng Miyembro ng Sambahayan)*

✓ 1-2
✓ 3-4
✓ 5-6
✓ 7 and above *(7 at pataas)*

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- *Monthly/Seasonal Average Income through Rice Farming (Buwanang/Pana-panahong Karaniwang Kita mula sa Pagsasaka ng Palay) specify:*

✓ Php 15,000.00 and below *(Php 15,000.00 at pababa)*
✓ Php 15,000.00 - Php 20,000.00
✓ Php 20,000.00 - Php 25,000.00
✓ Php 25,000.00 - Php 30,000.00
✓ Php 30,000.00 and above *(Php 30,000.00 at pataas)*

- *Number of Years in Operation (Bilang ng Taon sa Operasyon)*

✓ 1 years *(taon)*
✓ 2 years
✓ 3 years
✓ 4 years
✓ 5 years
✓ 6 years and above *(6 na taon at pataas)*

- *Affiliation or Association to Rice Industry (Ugnayan o Kaugnayan sa Industriya ng Palay) : __*

- *Training Attendance (Pagdalo sa Pagsasanay)*

✓ None *(Wala)*
✓ Farming Practices and Production *(Kasanayan at Produksiyong Pagsasaka)*
✓ Selling and Marketing *(Pagbebenta at Pagpapalaganap)*
✓ Organization and Management *(Organisasyon at Pamamahala)*
✓ Accounting and Finance *(Pagkakalkula at Pananalapi)*
✓ Others, please specify *(Iba pa, pakitukoy):* _____

- *Government Support Received (Natanggap na Suporta mula sa Gobyerno)*

✓ None *(Wala)*
✓ Training and Seminar *(Pagsasanay at Seminaryo)*
✓ Financial *(Pampinansyal)*
✓ Rice Paddy Farm *(Lupa sa Pagsasaka)*
✓ Rice Farming Machineries and Technologies *(Makinaryang Pangpalayan)*
✓ Others, please specify *(Iba pa, pakitukoy):* _____

- *Digital Proficiency (Kakayahan sa Paggamit ng Digital na Teknolohiya)*

✓ Smartphone
✓ Keypad Phone
✓ No Mobile Phone

➢ *Part II. Farm and economic characteristics (mga karakteristik ng farm at ekonomiya)*

- **Directions:** Please indicate your response by placing a check mark ☑ in the box corresponding to your selected answer. For items requiring specific information, kindly provide your response in the space allotted.

(Panuto: Mangyaring ipahiwatig ang inyong sagot sa pamamagitan ng paglalagay ng tsek ☑ sa kahong tumutugon sa inyong napiling kasagutan. Para sa mga aytem na nangangailangan ng tiyak na impormasyon, mangyaring isulat ang inyong sagot sa nakalaang espasyo.)

- *Type of Farm Ownership (Uri ng Pagmamay-ari ng Sakahan)*

✓ Holds Ownership *(May-ari ng Sakahan)*
✓ Tenants *(Umuupa)*
✓ Lessees *(Nangungupahan)*
✓ Amortizing *(Nagbabayad ng Amortisasyon)*

- *Others, please specify (Iba pa, pakitukoy):* _____

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- *Average Farm Size in Hectares (Laki ng Sakahan sa Ektarya)*

✓ 1.00 Hectares and below *(1.00 ektarya at pababa)*
✓ 1.01 - 1.25 Hectares
✓ 1.26 - 1.50 Hectares
✓ 1.51 - 2.00 Hectares
✓ 2.00 Hectares and above *(2.00 ektarya at pataas)*

- *Cropping Cycles per Year (bilang ng pagtatanim at pag-aani bawat taon)*

✓ One
✓ Two
✓ Three

- *Seasonal/Annual Average Production (Produksiyon Bawat Panahon/Taon)*

✓ 60 cavans and below
✓ 60-80 cavans
✓ 80-100 cavans
✓ 100-120 cavans
✓ 120 cavans and above

➢ *Part III. Production cost and financial viability of rice paddy farming (gastos sa produksiyon at pananagutang panlipunan ng pagsasaka ng palay)*

- Directions: Please supply the needed information or by placing a check mark ☑ in the box corresponding to your selected answer to produce rice categorized into fixed costs, monthly variable costs, and source of capital.

(Mangyaring sagutan ang mga kinakailangang impormasyon o lagyan ng tsek mark ☑ ang kahon na katabi ng iyong napiling sagot upang makabuo ng kategoryang gastos sa paggawa ng palay na nahahati sa nakatalagang gastos, buwanang di-tiyak na gastos at pinagkuhanang kapital.)

- *Fixed Costs (Nakatalagang Gastos)*

Description *(Paglalarawan)*	**Quantity *(Dami o bilang)***	**Year and Acquisition Cost *(Gastos noong Binili)***
Land / Land Rent Lupa *(Upa sa Lupa)*		
Farm Machinery *(Makinarya sa Sakahan); please specify*		
Farm Equipment *(Kagamitan sa Sakahan); please specify*		
Insurance Premiums *(Premyo sa Seguro)*		
Tax *(Buwis)*		
Others, please specify *(Iba pa, pakitukoy)*		

- *Variable Costs per Season (Buwanang Di-Tiyak na Gastos)*

Description *(Paglalarawan)*	**Quantity *(Dami o bilang)***	**Total Seasonal Cost *(Panahunang gastos)***
Labor *(Paggawa)*		
Seedling ***(****Pag-aalaga ng punla****)***		
Planting ***(****Pagtatanim****)***		
Fertilizing ***(****Pagpapataba****)***		
Weeding ***(****Pag-aalis ng damo****)***		
Pesticide Spraying		
Harvesting ***(****Pag-aani****)***		
Inputs *(Kagamitang Pagsasaka)*		
Seed ***(****Binhi****)***		
Fertilizer ***(****Pataba****)***		
Pesticide ***(****Pestisidyo****)***		

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Gasoline for transportation, logistics, irrigation pumps, etc. ***(****Gasolinang ginamit sa transportasyon, logistik, patubig, at iba pa****)***		
Others, please specify *(Iba pa, pakitukoy)*		

- *Source of Capital (Pinagkuhanang Kapital)*

✓ Personal Savings *(Sariling Ipon)*
✓ Family Assistance *(Tulong mula sa Pamilya)*
✓ Borrowed Capital *(Hiram na kapital)*

- *If borrowed, source/s of financing (Kung hiram, pinanggagalingan ng pinasiyal):*

✓ Government Agricultural Loans *(Pautang mula sa Gobyerno para sa Agrikultura)*
✓ Bank and other Financial Institution Loans *(Pautang sa Bangko iba pang Pinasiyal na Institusyon)*
✓ Cooperatives *(Kooperatiba)*
✓ Private Lenders *(Pautang mula sa Pribadong Nagpapahiram)*

- *Amortization *(if applicable)*: _____
- *Monthly Interest *(if applicable)*: _____
- *No. of Months/Years to Pay *(if applicable)*: _____

- *Others, Please Specify (Iba pa, Pakitukoy)*

✓ End of Survey. Thank you for your time and participation!
✓ (Wakas ng Sarbey. Maraming salamat po sa inyong oras at pakikibahagi!)

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APPENDIX E
VALIDATION OF INSTRUMENTS

- *Directions:* Rate the following criteria by placing a check mark ☑ according to the following scales:

✓ (**5**) = Excellent; (**4**) = Very Good; (**3**) = Good; (**2**) = Fair; (**1**) = Poor

- *Content Validation*

No.	Item	Rating				
		5	**4**	**3**	**2**	**1**
1	The directions given are clear in all sections of the data gathering instrument.					
2	Each item is clearly stated.					
3	Each item is readable i.e., the items are easily read.					
4	Each item is attractive to read; enough space is provided to avoid crowding among the items.					
5	The data gathering instrument is comprehensive i.e., it covers all areas that are important in the study.					
6	Each item is focused on a particular thought or idea.					
7	The items are objective i.e., the responses to be elicited are neither biased nor reactive.					
8	The items are formulated in accordance to the explicit/implicit objective of the study.					
9	The items are systematically arranged according to a desirable sequence.					
10	The items do not overlap with each other, no duplication of items is observed.					

- *Research Objective:*

This study aims to determine and explore the different income levels of rice paddy farmers in Nueva Ecija by analyzing the costs of production, both in the short run and long run, thereby providing a break-even point and profitability analysis to assess their financial sustainability and guide strategies for improving farm efficiency.

- *Attachments:*

✓ Conceptual Framework
✓ Statement of the Problem
✓ Survey Questionnaire

- *Summary and Suggestions:*

This is to certify that I fully reviewed and gave suggestions as well as recommendations to further validate the reliability of the questionnaire provided in the study: Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines: A Break-Even Point (BEP) and Profitability Analysis through Short-Run and Long-Run Cost Function.

(SIGNATURE OVER PRINTED NAME)

(Position / Designation)

(Organization)

(Date)

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APPENDIX F
QUESTIONNAIRE CONTENT VALIDATION

Research Objective:

This study aims to determine and explore the different income levels of rice paddy farmers in Nueva Ecija by analyzing the costs of production, both in the short run and long run, thereby providing a break-even point and profitability analysis to assess their financial sustainability and guide strategies for improving farm efficiency.

Attachments:

1. Conceptual Framework
2. Statement of the Problem
3. Survey Questionnaire

Summary and Suggestions:

To strengthen the study and ensure comprehensive analysis, consider the following:

1. **Seed Type Selection**
   - **Hybrid Seeds**: Higher cost but offer strong tillering and higher yield potential.
   - **Inbred Seeds**: Lower cost, can produce many tillers, but often fewer productive panicles, resulting in lower yield compared to hybrids.
   - **Recommendation**: Include seed type as a variable in the profitability analysis to assess its impact on income and cost efficiency.
2. **Planting Method**
   - **Direct Seeding (Sabog Tanim)**: Generally less labor-intensive but may affect plant density and weed management.
   - **Transplanting (Lipat Tanim)**: More labor-intensive but can improve plant spacing and yield consistency.
   - **Recommendation**: Factor in labor cost and yield differences between these methods in the cost function analysis.
3. **Cropping Intensity**
   - Farmers report varying cropping cycles per year (one, two, or three).
   - **Recommendation**: Incorporate cropping frequency into the long-run cost analysis to determine its effect on profitability and sustainability.
4. **Additional Considerations**
   - Include **input cost variability** (fertilizers, pesticides, irrigation).
   - Assess **market price fluctuations** for paddy rice.

ANALYZING THE INCOME LEVEL OF RICE PADDY FARMERS

This is to certify that I fully reviewed and gave suggestions as well as recommendations to further validate the reliability of the questionnaire provided in the study: **Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines: A Break-Even Point (BEP) and Profitability Analysis through Short-Run and Long-Run Cost Function.**

JOHN DAVID S. ESTEVES
Agricultural and Biosystems Engineer
Land Bank of the Philippines

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25dec656

Research Objective:

This study aims to determine and explore the different income levels of rice paddy farmers in Nueva Ecija by analyzing the costs of production, both in the short run and long run, thereby providing a break-even point and profitability analysis to assess their financial sustainability and guide strategies for improving farm efficiency.

Attachments:

1. Conceptual Framework
2. Statement of the Problem
3. Survey Questionnaire

Summary and Suggestions:

Please take note of my comments / suggestions in each page.

All detail info should be gathered in per season in the same year (i.e. wet season 2025, dry season 2025) across all respondents

This is to certify that I fully reviewed and gave suggestions as well as recommendations to further validate the reliability of the questionnaire provided in the study: **Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines: A Break-Even Point (BEP) and Profitability Analysis through Short-Run and Long-Run Cost Function.**

(SIGNATURE OVER PRINTED NAME) respondents
(Position / Designation) AR SALVADOR
(Organization) Supv SRS
(Date) PhilMech
NOV 13, 2025

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25dec656

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Attachments:

1. Conceptual Framework
2. Statement of the Problem
3. Survey Questionnaire

Summary and Suggestions:

1. Use seasonal income only instead of monthly figures, as rice farmers typically earn on a per-cropping-season basis and not through regular monthly income. This adjustment will produce more realistic ranges and more accurate data for profitability and break-even analysis.
2. Revise the "Number of Years in Operation" into broader year ranges, as the current single-year options are too limited and do not reflect the typically long farming experience of rice paddy farmers. Using grouped ranges such as *1–3 years, 4–6 years, 7–10 years, 11–15 years,* and *16 years and above* will allow for more accurate reporting and easier data interpretation.
3. To ensure compliance with SOP and accurate financial evaluation, it is recommended to systematically collect and measure data for the SOP 3-5.
4. Organize the questionnaire based on the SOP.
5. For your Questionnaire 2.3, it is recommended to use cavan as the unit of measurement, as it is more familiar to farmers. Furthermore, reporting production for a single season or harvest at a time will enhance clarity and ensure consistency, particularly for farms with two growing seasons. It is recommended to use cavan as the unit of measurement, as it is more familiar to farmers. Furthermore, reporting production for a single season or harvest at a time will enhance clarity and ensure consistency, particularly for farms with two growing seasons.

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AL JOHN P. MARCELINO, PhD, CFPP
Graduate School Professor/College Instructor
College of the Immaculate Conception
November 26, 2025

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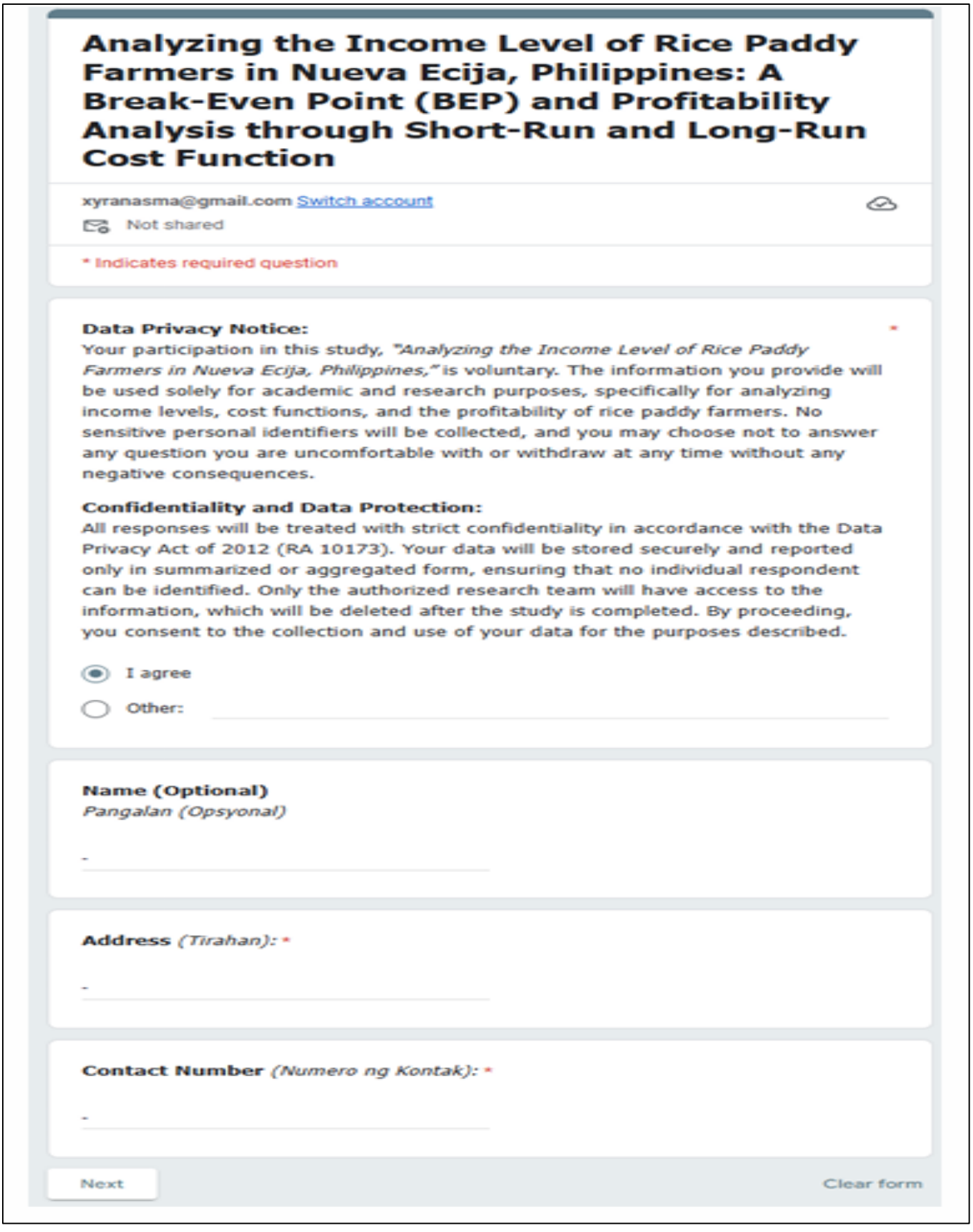
APPENDIX G
GOOGLE FORM SURVEY QUESTIONNAIRE



Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines: A Break-Even Point (BEP) and Profitability Analysis through Short-Run and Long-Run Cost Function

xyranasma@gmail.com Switch account

Not shared

* Indicates required question

Data Privacy Notice: *

Your participation in this study, *"Analyzing the Income Level of Rice Paddy Farmers in Nueva Ecija, Philippines,"* is voluntary. The information you provide will be used solely for academic and research purposes, specifically for analyzing income levels, cost functions, and the profitability of rice paddy farmers. No sensitive personal identifiers will be collected, and you may choose not to answer any question you are uncomfortable with or withdraw at any time without any negative consequences.

Confidentiality and Data Protection:

All responses will be treated with strict confidentiality in accordance with the Data Privacy Act of 2012 (RA 10173). Your data will be stored securely and reported only in summarized or aggregated form, ensuring that no individual respondent can be identified. Only the authorized research team will have access to the information, which will be deleted after the study is completed. By proceeding, you consent to the collection and use of your data for the purposes described.

- (●) I agree
- ( ) Other:

Name (Optional)
Pangalan (Opsyonal)

Your answer

Address *(Tirahan):* *

Your answer

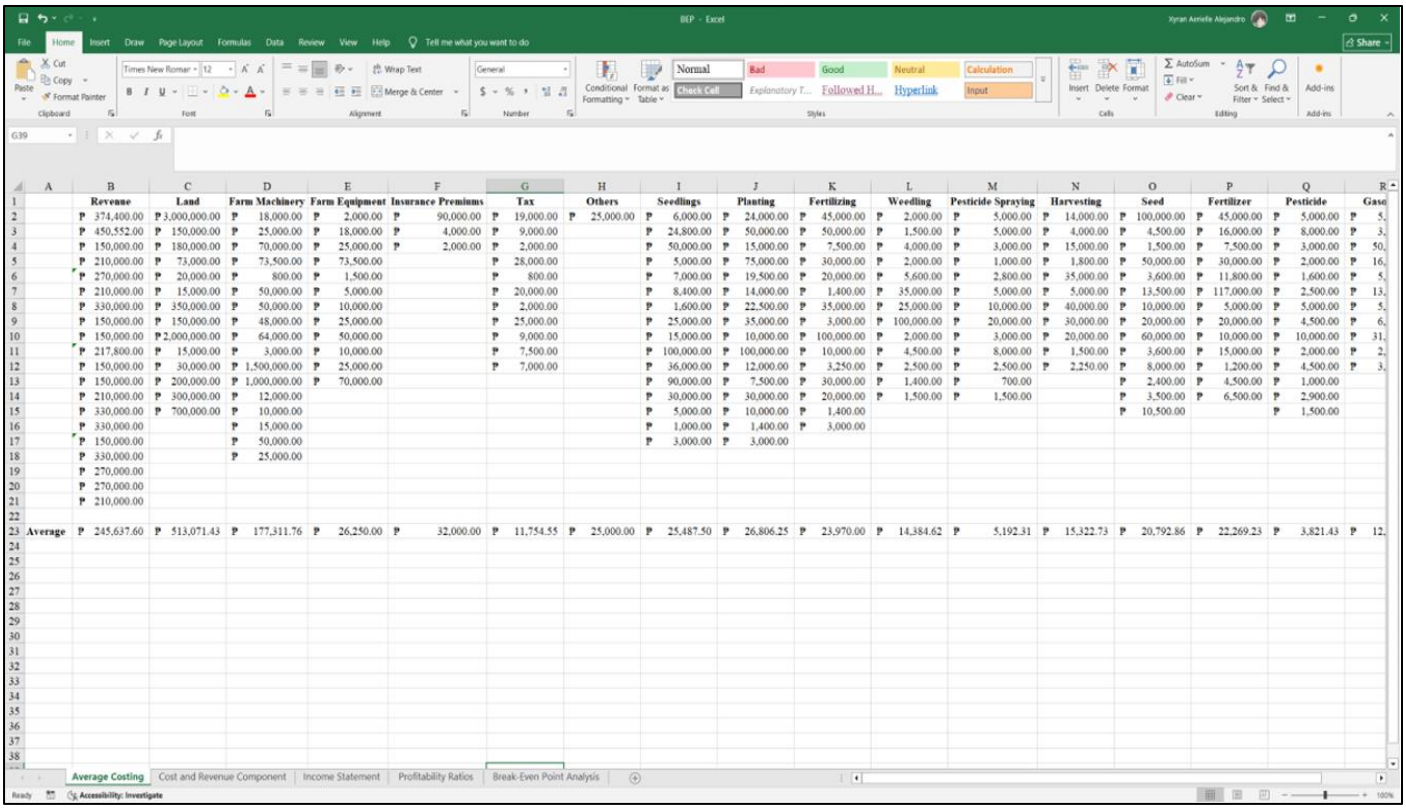
Contact Number *(Numero ng Kontak):* *

Your answer

Next Clear form

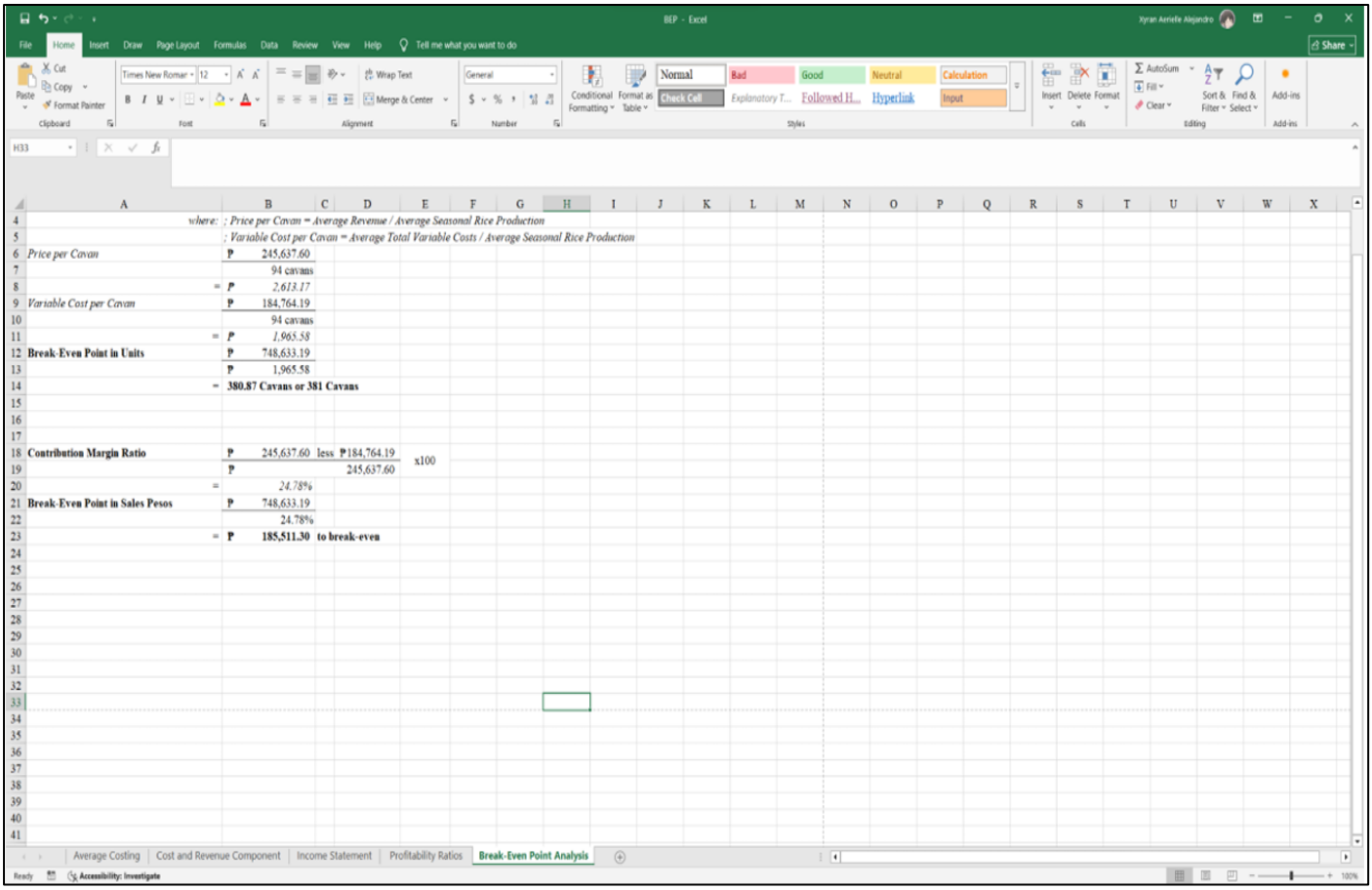
ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25dec656

APPENDIX H
EXCEL COMPUTATIONS FOR PROFITABILITY AND BEP



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1		Revenue	Land	Farm Machinery	Farm Equipment	Insurance Premiums	Tax	Others	Seedlings	Planting	Fertilizing	Weedling	Pesticide Spraying	Harvesting	Seed	Fertilizer	Pesticide	Gase
2		₱ 374,400.00	₱ 3,000,000.00	₱ 18,000.00	₱ 2,000.00	₱ 90,000.00	₱ 19,000.00	₱ 25,000.00	₱ 6,000.00	₱ 24,000.00	₱ 45,000.00	₱ 2,000.00	₱ 5,000.00	₱ 14,000.00	₱ 100,000.00	₱ 45,000.00	₱ 5,000.00	₱ 5,
3		₱ 450,552.00	₱ 150,000.00	₱ 25,000.00	₱ 18,000.00	₱ 4,000.00	₱ 9,000.00		₱ 24,800.00	₱ 50,000.00	₱ 50,000.00	₱ 1,500.00	₱ 5,000.00	₱ 4,000.00	₱ 4,500.00	₱ 16,000.00	₱ 8,000.00	₱ 3,
4		₱ 150,000.00	₱ 180,000.00	₱ 70,000.00	₱ 25,000.00	₱ 2,000.00	₱ 2,000.00		₱ 50,000.00	₱ 15,000.00	₱ 7,500.00	₱ 4,000.00	₱ 3,000.00	₱ 15,000.00	₱ 1,500.00	₱ 7,500.00	₱ 3,000.00	₱ 50,
5		₱ 210,000.00	₱ 73,000.00	₱ 73,500.00	₱ 73,500.00		₱ 28,000.00		₱ 5,000.00	₱ 75,000.00	₱ 30,000.00	₱ 2,000.00	₱ 1,000.00	₱ 1,800.00	₱ 50,000.00	₱ 30,000.00	₱ 2,000.00	₱ 16,
6		₱ 270,000.00	₱ 20,000.00	₱ 800.00	₱ 1,500.00		₱ 800.00		₱ 7,000.00	₱ 19,500.00	₱ 20,000.00	₱ 5,600.00	₱ 2,800.00	₱ 35,000.00	₱ 3,600.00	₱ 11,800.00	₱ 1,600.00	₱ 5,
7		₱ 210,000.00	₱ 15,000.00	₱ 50,000.00	₱ 5,000.00		₱ 20,000.00		₱ 8,400.00	₱ 14,000.00	₱ 1,400.00	₱ 35,000.00	₱ 5,000.00	₱ 5,000.00	₱ 13,500.00	₱ 117,000.00	₱ 2,500.00	₱ 13,
8		₱ 330,000.00	₱ 350,000.00	₱ 50,000.00	₱ 10,000.00		₱ 2,000.00		₱ 1,600.00	₱ 22,500.00	₱ 35,000.00	₱ 25,000.00	₱ 10,000.00	₱ 40,000.00	₱ 10,000.00	₱ 5,000.00	₱ 5,000.00	₱ 5,
9		₱ 150,000.00	₱ 150,000.00	₱ 48,000.00	₱ 25,000.00		₱ 25,000.00		₱ 25,000.00	₱ 35,000.00	₱ 3,000.00	₱ 100,000.00	₱ 20,000.00	₱ 30,000.00	₱ 20,000.00	₱ 20,000.00	₱ 4,500.00	₱ 6,
10		₱ 150,000.00	₱ 2,000,000.00	₱ 64,000.00	₱ 50,000.00		₱ 9,000.00		₱ 15,000.00	₱ 10,000.00	₱ 100,000.00	₱ 2,000.00	₱ 3,000.00	₱ 20,000.00	₱ 60,000.00	₱ 10,000.00	₱ 10,000.00	₱ 31,
11		₱ 217,800.00	₱ 15,000.00	₱ 3,000.00	₱ 10,000.00		₱ 7,500.00		₱ 100,000.00	₱ 100,000.00	₱ 10,000.00	₱ 4,500.00	₱ 8,000.00	₱ 1,500.00	₱ 3,600.00	₱ 15,000.00	₱ 2,000.00	₱ 2,
12		₱ 150,000.00	₱ 30,000.00	₱ 1,500,000.00	₱ 25,000.00		₱ 7,000.00		₱ 36,000.00	₱ 12,000.00	₱ 3,250.00	₱ 2,500.00	₱ 2,500.00	₱ 2,250.00	₱ 8,000.00	₱ 1,200.00	₱ 4,500.00	₱ 3,
13		₱ 150,000.00	₱ 200,000.00	₱ 1,000,000.00	₱ 70,000.00				₱ 90,000.00	₱ 7,500.00	₱ 30,000.00	₱ 1,400.00	₱ 700.00		₱ 2,400.00	₱ 4,500.00	₱ 1,000.00	
14		₱ 210,000.00	₱ 300,000.00	₱ 12,000.00					₱ 30,000.00	₱ 30,000.00	₱ 20,000.00	₱ 1,500.00	₱ 1,500.00		₱ 3,500.00	₱ 6,500.00	₱ 2,900.00	
15		₱ 330,000.00	₱ 700,000.00	₱ 10,000.00					₱ 5,000.00	₱ 10,000.00	₱ 1,400.00				₱ 10,500.00		₱ 1,500.00	
16		₱ 330,000.00		₱ 15,000.00					₱ 1,000.00	₱ 1,400.00	₱ 3,000.00							
17		₱ 150,000.00		₱ 50,000.00					₱ 3,000.00	₱ 3,000.00								
18		₱ 330,000.00		₱ 25,000.00														
19		₱ 270,000.00																
20		₱ 270,000.00																
21		₱ 210,000.00																
22																		
23	Average	₱ 245,637.60	₱ 513,071.43	₱ 177,311.76	₱ 26,250.00	₱ 32,000.00	₱ 11,754.55	₱ 25,000.00	₱ 25,487.50	₱ 26,806.25	₱ 23,970.00	₱ 14,384.62	₱ 5,192.31	₱ 15,322.73	₱ 20,792.86	₱ 22,269.23	₱ 3,821.43	₱ 12,

Average Costing | Cost and Revenue Component | Income Statement | Profitability Ratios | Break-Even Point Analysis



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
4		*where: ; Price per Cavan = Average Revenue / Average Seasonal Rice Production*																						
5		*; Variable Cost per Cavan = Average Total Variable Costs / Average Seasonal Rice Production*																						
6	*Price per Cavan*	₱ 245,637.60																						
7		94 cavans																						
8	=	₱ *2,613.17*																						
9	*Variable Cost per Cavan*	₱ 184,764.19																						
10		94 cavans																						
11	=	₱ *1,965.58*																						
12	**Break-Even Point in Units**	₱ 748,633.19																						
13		₱ 1,965.58																						
14	=	**380.87 Cavans or 381 Cavans**																						
15																								
16																								
17																								
18	**Contribution Margin Ratio**	₱ 245,637.60	less	₱ 184,764.19	x100																			
19		₱ 245,637.60																						
20	=	*24.78%*																						
21	**Break-Even Point in Sales Pesos**	₱ 748,633.19																						
22		24.78%																						
23	=	₱ **185,511.30**	**to break-even**																					

Average Costing | Cost and Revenue Component | Income Statement | Profitability Ratios | Break-Even Point Analysis

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APPENDIX I
CORRESPONDING LINKS FOR OUTPUTS

Item	Corresponding Link
Appendices	https://drive.google.com/drive/folders/100lhczf50SKZsQrzXdX_qVxuNz-RWlLy?usp=drive_link
Concept Paper	https://docs.google.com/document/d/1-jMRd2YkhqRpujU0ZV05Ni2dao3JWgXLrVDoM0s3YKE/edit?usp=drive_link
Google Form Survey Questionnaire	https://docs.google.com/forms/d/e/1FAIpQLSe-AURypUmlm5UQR8QGQ-S8BVBx7Hl8S30x-WQQObHiQAiiFQ/viewformhttps://docs.google.com/forms/d/e/1FAIpQLSe-AURypUmlm5UQR8QGQ-S8BVBx7Hl8S30x-WQQObHiQAiiFQ/viewform
Progress Monitoring	https://docs.google.com/spreadsheets/d/1k_uObq4P_gLdPEI0EPL5u4OuBYTQ3o6SvCY5bWQFPxE/edit?usp=drive_link