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Strategic Interventions for Rice Farming: Analyzing Challenges and Opportunities in Nueva Ecija, Philippines

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ABSTRACT

This study addresses the critical challenge of declining farm viability by investigating the chronic difficulties encountered by rice farmers in Nueva Ecija, a province vital to Philippine food security. Employing a descriptive research method, data was systematically collected via a survey instrument administered to a sample of 30 farmers selected through convenience sampling from the key municipalities of Llanera, Laur, and Guimba. The analysis utilized descriptive statistics to establish the farmer profile and quantify the socioeconomic and operational hurdles. The findings portray a demographic of aging, highly experienced farmers working small, 2–3 hectare farms with basic education. The central issue identified is severe income volatility due to seasonal differences, where profitable dry-season harvests are often negated by rainy-season losses. Operational struggles include prohibitively high input costs, often exacerbated by a lack of crucial government support like fertilizer vouchers. Other critical weaknesses encompass persistently low palay prices, the detrimental use of poor-quality seeds, limited access to essential post-harvest facilities, and restricted avenues for formal financing. These core problems are magnified by climate change, which introduces extreme weather risks that severely depress yield and overall income. The study concludes by urging a comprehensive, collaborative action plan. Key interventions must prioritize augmenting effective government aid, establishing stable price guarantees, promoting sustainable and climate-resilient farming

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practices, and developing vital infrastructure. Such efforts are paramount to stabilizing farmers' livelihoods and ensuring the long-term integrity of the Philippines' rice sector.

Keywords: Challenges; Climate Change; Farmers; Farmlands; Farm Inputs; Rice

1. Introduction

Nueva Ecija, the biggest province in Central Luzon, is the clear agricultural heartland of the Philippines. People call it the "Rice Bowl of the Country" because its naturally fertile soil is perfect for growing a wide variety of lowland crops, such as rice (palay), corn, onions, and sugarcane. Farming is not just a business; it is the heart of the local culture, and family-based units make up the bulk of the workforce. This deep reliance on farming shows how important the province is to national food security, as it grows a lot of the country's staple foods and supports many jobs. The cycle of planting and harvesting is a cultural legacy that has been passed down through generations. It shapes the community's identity and is the basis of its economy.

But this important local context is part of a bigger, more complicated global food system that is under a lot of stress. By 2050, the world's population is expected to be close to 10 billion^[1]. This means that food production will need to grow by a lot and in a way that lasts. This population boom, along with rising incomes in developing countries, is making people want more resource-intensive goods like meat and dairy^[2]. As a result, the agricultural industry is under a lot of pressure to produce more while also reducing its impact on the environment. Conventional farming methods, on the other hand, cause a lot of pollution and soil degradation^[3]. Sustainable farming methods, on the other hand, can help ecosystems by storing carbon and reducing flooding. Agriculture is both a solution and a cause of environmental problems, which makes it hard to ensure global food security. To do this, we need to find a balance between productivity and protecting the environment^[4]. Farmers in a place like Nueva Ecija have to deal with a global market that is limited by resources and changing environmental standards. This is hard to do without enough help from institutions.

There are worrying signs that the rice sector is be-

coming less stable on a national level, especially in the areas where it is most important to grow rice. The Philippine Statistics Authority^[5] has released new information showing that the region's total palay output has gone down. This is mostly because Nueva Ecija's production has dropped by a huge 24.3%. This trend is worrying because the province still makes up about 44.6% of the region's total palay output, showing that it is still very important even though it has had a setback. If the drop in production isn't stopped, it could have serious effects, such as making people more dependent on food imports, causing prices to change a lot for consumers, and making farming communities even poorer. This evidence indicates that the existing agricultural support systems are inadequate to address the complexities of contemporary climatic and economic pressures^[6].

Empirical studies have elucidated the precise factors contributing to this vulnerability. Studies consistently identify two primary internal barriers to agricultural resilience: inadequate financial literacy and limited access to microfinancing^[7]. Farmers often don't have the money they need to buy new tools or weather the financial storms that come with a bad harvest. This keeps them in a cycle of debt that makes them worse off. Because they can't get formal loans, many people have to turn to informal lenders who charge high interest rates, which cuts into their already small profit margins^[8]. A study by Francisco^[9] also found that the region's technical knowledge and use of important post-harvest technologies are still low. This is directly related to high levels of waste and less competition in the market.

To deal with these systemic problems, new ways of farming are being looked into. Macaso^[10] talks about how hydroponics and other alternative methods could help solve problems with traditional farming in tropical areas like Nueva Ecija, especially those that have to do with not having enough water and not having enough land. Nonetheless, the effective incorporation of technological advancements necessitates robust policy frame-

works that enhance and bolster these innovations at the community level.

To fix the decline, we need to fully understand the complicated reasons why farmers do what they do and how they make economic decisions^[11]. The government is very important in making the world a better place for agriculture to thrive. This means that we need to do more than just give money; we need to focus on long-term, sustainable solutions. To lessen the effects of climate change and make harvests more reliable and frequent, the province needs to improve and expand its irrigation systems right away^[12]. To get better yields and work more efficiently, farmers also need access to better seeds and newer farm equipment^[13].

The government needs to deal with market problems, like the fact that palay prices are always changing, by putting in place a fair pricing system. Such a mechanism would guarantee that farmers receive fair remuneration for their labor, instead of being adversely affected by market fluctuations driven by imports^[14]. Farmers will continue to have problems, and the long-term health of the “Rice Bowl of the Country” will be at risk if there are no strong and focused actions that address financial, technical, and market weaknesses all at once.

While national studies have broadly identified major constraints in Philippine rice production, there remains a critical dearth of empirical research providing a localized, methodical examination of the specific, intertwining obstacles hindering palay production in the premier rice granary, Nueva Ecija. Consequently, a direct, evidence-based link between farmer challenges in this vital province and strategic national policy remains largely unexplored. This study aims to enrich this essential national dialogue by methodically examining the specific obstacles hindering palay production in Nueva Ecija province. This research seeks to elucidate the challenges faced by rice farmers, aiming to deliver empirically substantiated insights that will guide strategic initiatives to improve their livelihoods and ensure national food security. The useful information collected is meant to help create plans for sustainable agricultural growth, increase palay production, and ask government agencies to improve current programs and take strong action to lower rising input costs so that farmers can make up for

their repeated losses. For the farming communities of Nueva Ecija and the whole country to have a strong and prosperous future, we need to take this proactive and evidence-based approach.

1.1. Significance of the Study

The results of this study are very useful for a lot of people, starting with the farmers themselves. The results can help them come up with better ways to run their farms and do business, giving them a clear plan for how to deal with the problems and disagreements that come up in their farming work. The study is also useful for government agencies, especially the Department of Agriculture and the Department of Agrarian Reform. The study can help make new policies and targeted programs that lower production costs, make sure fair market prices, and provide important support services by giving important information about how farmers are doing. Furthermore, the study’s insights can enlighten palay traders about the socioeconomic hardships that farmers face due to low prices, potentially encouraging more equitable compensation and fostering fairer trade practices. Lastly, the community as a whole can learn more about how complicated rice farming is and how important it is to buy local farmers’ goods to help them. This greater awareness can make the whole agricultural ecosystem stronger, leading to a more sustainable and beneficial relationship between producers and consumers.

1.2. Theoretical and Literature Framework

The present study’s analysis of the systemic challenges encountered by rice farmers in Nueva Ecija is fundamentally rooted in Production Management Theory and the methodologies of Operations Management Theory. The financial realities examined in the literature fundamentally undermine Production Management, which emphasizes the planning, organizing, directing, and controlling of activities to efficiently convert inputs into finished goods. Farmers have a hard time figuring out how much their work will cost and how good it will be because inputs are expensive and prices in the market are hard to predict^[15]. High input costs are still a prob-

lem for the industry, and recent reports show that they have gone up sharply, which makes it harder for farmers to make decisions and make money^[16]. The prevalent deficiency in financial literacy and dependence on informal, high-interest lenders illustrate a substantial failure in the regulatory aspect of production management, as the true economic costs of production are overstated and mismanaged, thus endangering the viability of the entire conversion process^[17,18].

Operations Management Theory, which focuses on getting the most out of resources and meeting customer needs in the most cost-effective way, also shows the operational problems in the rice sector. The reported post-harvest losses (10–50% in the Philippines) due to inadequate facilities constitute a significant breach of this operational mandate, indicating substantial resource wastage and inefficiency in delivering rice, which accounts for 21% of global energy^[19]. International studies confirm that these losses severely reduce farmers' gross margins and call for urgent investments in post-harvest processing technologies and training to improve efficiency^[20,21]. The agricultural sector's low total factor productivity (TFP) growth rate of 1.7% in 2021, which was caused by slow technological innovation, is another sign of this operational inefficiency. Low TFP growth remains a critical challenge, underscoring the need for public goods investment, such as R&D and infrastructure, to enhance overall productive capacity^[22,23]. Climate change also poses serious threats, such as unpredictable typhoons and floods^[24], which directly disrupt the production system. Studies on farmer adaptation in the Philippines emphasize that climate variability exacerbates challenges like low yields and pest outbreaks, necessitating a focus on resilience and integrated management practices^[25,26]. This means that operational planning needs to change to focus on resilience and risk management in order to protect yields. To keep the sector viable for future generations, we need to move beyond basic production control to a holistic operations strategy. This is because of structural and demographic changes like an aging farming population and limited market access^[27]. The challenges identified in this study are not isolated issues; rather, they represent failures of fundamental management principles to adapt to contempo-

rary economic, environmental, and structural pressures. This necessitates systemic operational enhancements to guarantee the long-term sustainability of the nation's rice supply.

2. Materials and Methods

The study was meticulously crafted employing a descriptive research methodology to deliver a comprehensive, precise, and methodical portrayal of the conditions encountered by rice farmers in Nueva Ecija. This method was specifically selected because the main goal was to clarify the complexities and measure the challenges faced by the local agricultural community, rather than to test a hypothesis or determine cause-and-effect relationships. By focusing the research on four important and related operational areas—production, technical practices, marketing strategies, and financial management—the study made sure that the farmers' socioeconomic situation was fully and deeply understood. This organized method lets the study's results be used as a strong situational analysis, which is the basis for creating targeted and useful intervention strategies.

2.1. Sampling Procedure

The study employed Convenience Sampling, a method delineated as a pragmatic and accessible data collection technique^[28]. This non-probability method was chosen on purpose because it was quick and easy to use, given the study's limited resources and the need to get timely, high-quality data from a group of people who are known to be hard to reach during busy farming times. The sample consisted of 30 farmers selected from three primary agricultural centers: Llanera, Laur, and Guimba. This site selection was intentional; these municipalities were chosen not only for their ease of access but also because they made significant and verifiable contributions to the province's overall palay production. This made sure that the data collected had high ecological validity, which meant that the results were very useful for a large part of the province's farming industry. To make sure that all of the chosen sites were represented fairly, 10 farmers were chosen at random from the population in each municipality. This focused method let the study

get a lot of firsthand information from a group of experienced farmers who are at the heart of the region’s agricultural industry.

2.2. Respondents

The study’s participants were farmers from the chosen municipalities, intentionally selected for their profound expertise and extensive, decades-long experience in palay cultivation. Because so many of them had worked in this field for decades, they were thought to be the best source of information about the daily, small problems that come up in the industry. Their hands-on

experience gives them important qualitative context that lets them explain specific problems, like seed quality issues or marketing bottlenecks, in a way that general data can’t. Also, it’s important to choose farmers from Llanera, Laur, and Guimba because these areas are known for being very important to Nueva Ecija’s rice production (**Table 1**). Because they all farm together, they are great ways to see problems that affect the whole industry. In the end, these respondents were chosen because they had a lot of practical experience, were important to the local agricultural economy, and could give the detailed information needed to come up with good solutions for palay farmers all over the province.

Table 1. Distribution of Respondents.

Municipalities	Sample
Llanera	10
Laur	10
Guimba	10
Total	30

2.3. Research Site

This study took place in Nueva Ecija, a province in the Philippines known for being one of the best places to grow palay, or un-milled rice. Farming is the main way most people in the province make money, and there are a lot of farms there. The study concentrated on three municipalities in Nueva Ecija: Llanera, Laur, and Guimba. Llanera is a fourth-class municipality with an economy that is mostly based on farming. Rice is the main product. Llanera’s agricultural output is significant, with over 8100 hectares of land used for palay and more than 90% of its population relying on the rice industry. Laur is a third-class municipality whose economy is also based on farming. Its main crops are rice and onions, and rice fields make up more than 82% of its farmland. A local irrigators association, rivers, and groundwater all help the farmers in Laur water their crops. Guimba is one of Nueva Ecija’s 32 municipalities that consistently contributes to the province’s total rice production. Guimba is an important part of the region’s farming industry because it has about 15,514 hectares of rice farmland. The study looked at the problems that farmers in these three towns face, including the production, technical, marketing, and financial parts of their work. The goal was to

give a full picture of the business side of farming in this important farming area.

3. Results and Discussion

3.1. Demographic Profile of the Farmer Respondents

The study’s results show that the farmers who were surveyed all fit a certain demographic profile that shows the bigger problems in the agricultural sector. Most farmers are married adults between the ages of 40 and 60. Most of them don’t have much education; most of them only finished elementary school. This picture of an aging, traditional workforce shows that there is a generational gap in the agricultural sector that is about to happen. This is because younger people often look for jobs outside of farming. These farmers have been growing crops on their land for an average of more than 25 years. Most of them run farms that are 2 to 3 hectares in size, which they either own or rent. Their operations are not very big. Even after many years of hard work, their money problems are still bad. The study found that their average income from each harvest ranges from ₱50,000 to ₱75,000. This amount is not very stable because it

is affected by things that are out of their control. It is very important that these farmers' finances are not stable. Their income is not only low, but it is also very vulnerable to the constant problem of rising input costs, like those for pesticides, fertilizers, and labor. It is almost impossible to plan for the future financially when prices and inflation are always changing and costs are going up. Farmers are always worried about changes in their income, which keeps them stuck in a cycle of low capital and high-interest debt. This makes it hard for them to invest in new technologies or ways of doing things. This economic weakness shows how important it is to provide systemic support to make sure that their livelihoods and the agricultural sector as a whole can last for a long time.

3.2. SWOT on the Current Practices of Farmer-Respondents

3.2.1. Production

The study's results show that the farmers' current practices are complicated. The best way to understand them is through a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis. The farmers themselves named a few key strengths, the most important of which are the steady demand for their rice and what they see as manageable production costs. The fact that the market is always open gives them a reliable place to sell their goods, which is very important for their business. But these strengths are hurt by big Weaknesses that make things very hard for the company. High labor costs, a widespread lack of good cost-management skills, and budget problems that never go away are the most important of these. This combination makes the farmers' finances very shaky, even though the market is stable. Many people get stuck in a cycle of debt because they can't effectively manage their costs and get enough money. This makes it hard for them to grow and invest. Even though they have problems on the inside, farmers see a number of outside chances that could make things better for them. These include the possibility of prices going up when there isn't enough of something on the market and the fact that production inputs are always available. By taking advantage of these

chances, like timing their sales well, they could make more money and better handle the money problems they have. On the other hand, the farming community faces a number of serious threats from outside. The most important of these is tough competition from imported rice, which can lower prices in the local market. Other threats are the constant rise in overall production costs, the chance of terrible pest infestations, and not having enough workers. Price ceilings set by the government make these problems even worse by directly limiting farmers' ability to make a fair living. When these threats are put together, they make the environment very dangerous for farmers, putting their livelihoods at risk all the time. This shows how important it is to have a complete plan to strengthen the agricultural sector from the inside and protect it from outside forces.

3.2.2. Marketing

The market for rice farmers is a complicated mix of good and bad things, chances, and dangers. On the plus side, farmers have a lot of strengths, such as a steady demand for their rice, low prices, and well-known ways to sell their rice. These things make their business stable. But these benefits are lessened by big problems. Farmers have a hard time because prices are very unstable, they can't get enough land to grow, and their storage space isn't good enough. This often means they have to sell their harvest right away, which makes them vulnerable to changes in the market. Also, inconsistent yield volumes are a constant problem that makes it hard to plan and manage income. Even though there are problems within the organization, farmers can still make things better for themselves. They can sell their goods for more money when there aren't many of them, and they benefit from having low production costs in general. A growing market for their goods gives them a chance to make more money. On the other hand, farmers face serious threats from outside. These include delayed government support and low market prices that don't go up, which are often caused by strong competition from imported rice. Another big problem is that sales have to meet stricter quality standards. All of these threats put a lot of stress on farmers' livelihoods and show how important it is to make changes to the system to protect the domestic agri-

cultural sector.

3.2.3. Technical

The study's results show that the farmers' technical practices have both good and bad points. They have some natural strength, like their traditional skills, but these are often weakened by worries about water supply and the need for a skilled workforce. The main problems found were high labor costs, not being able to get modern farm equipment, and having to rely on rainwater that isn't always reliable because of bad irrigation coverage. Farmers see clear ways to make things better, even with these problems. They think that better government support, better access to higher-quality seedlings, and better irrigation systems could all help them work more efficiently. These changes are very important for reducing the most serious threats they face, such as La Niña and El Niño, which are unpredictable climate events that directly affect yield and quality. There are also other threats to their income, like bad seedlings, not enough supplies, and not enough government subsidies.

3.2.4. Financial

The study's results about how farmers manage their money show that they have both strengths and serious weaknesses. Farmers said that there were some good things about the program, like the fact that they could keep working capital and sometimes make enough money with low operating costs. But these small successes are not enough to make up for the big problems, such as a general lack of financial literacy, high-interest rates from informal lenders, and very limited access to capital. Even with these problems inside, farmers see clear ways to make things better. They think that lower interest rates on loans, easier access to capital, and higher prices for their crops would help them a lot with their money problems. But these chances are always at risk. The most serious threats are a constant imbalance between income and expenses, an increasing reliance on high-interest credit loans, and not enough help from the government. These outside factors make the internal problems worse, putting farmers in a cycle of financial

instability that hurts their livelihoods and long-term viability.

3.3. Challenges Faced by Rice Farmers

3.3.1. Production

The agricultural production cycle in Nueva Ecija is under a lot of stress right now because the economy is always changing and the environment is changing quickly (Table 2). Farmers are having a hard time because the prices of important inputs like fertilizers and pesticides are going up. These prices are often set by unstable global markets. The high cost of labor, which always eats into already thin profit margins, makes this financial strain even worse. These economic problems make the farming community's foundation weak, so there isn't much room for mistakes or unexpected costs. The weather is unpredictable and changes all the time, which makes this already bad financial situation even worse. Extreme weather events, like more frequent and stronger typhoons, longer droughts, and severe flooding, are always a threat to farmers. These changes in the weather not only destroy crops, but they also throw off the whole production schedule, causing major delays and the loss of all the hard work of a season. These pressures have a big impact on farm productivity, which often leads to lower-quality produce and seeds for the next harvest. Quang^[29] say that these problems go far beyond the livelihood of the individual farmer. They are bad for society and the environment as a whole, putting national food security at risk and making rural poverty worse. Many people have to give up farming because it's hard to make a living, which leads to people moving from rural to urban areas and a growing problem of an aging farming population. This complicated network of related problems shows how important it is to work together and from many different angles. For agriculture to have a long-term future, all parties involved must work together to lessen the effects of climate change while also giving farmers the help they need to create a more stable and profitable system.

Table 2. Challenges Facing by Rice Farmers (Production).

Indicators	Weighted Mean	Verbal Interpretation
Production:		
1 Spiraling cost of fertilizers, pesticides, etc.	3.82	Strongly Agree
2 Erratic climate condition, typhoon and floods included	3.76	Strongly Agree
3 Exorbitant labor cost	3.56	Strongly Agree
4 Inferior quality of seeds	3.54	Strongly Agree
5 Poor quality of produce	3.36	Strongly Agree
6 Unforeseen extreme weather events or climate change that impacted production	3.66	Strongly Agree
Average Weighted Mean	3.62	Strongly Agree

3.3.2. Marketing

Rice farmers face a lot of complicated problems in the marketing world that hurt their income and bargaining power (Table 3). The ongoing problem of too much supply in the domestic market means that farmers often have to sell their crops for very low prices, making it hard for them to even break even on their costs. National and international policies make this market even more unstable. The Rice Tariffication Law and WTO rules are meant to make rice cheaper for consumers, but they have led to a flood of cheaper imported rice on the market. Because of all the competition, local farmers can't make a living anymore because they can't compete with the lower prices of imported goods. A comprehensive approach is urgently needed to deal with these many problems. Setting up fairer pricing systems that protect farmers from market swings is an important step. This could include price floors set by the government or di-

rect purchasing programs that make sure workers get a fair return on their hard work. It is also important to teach farmers more about how to run a business, market trends, and how government policies affect them. Giving farmers this information would help them make better choices and give them a better chance of getting a good deal with big traders. In the end, government programs need to be looked at again to make sure that the domestic rice industry is the most important thing. This includes not only continuing subsidies but also actively promoting fair trade practices and investing in post-harvest facilities that would reduce spoilage and give farmers the power to keep their crops until prices stabilize. There needs to be a careful balance between import policies that keep the country's food supply safe and protective measures that protect the jobs of local farmers. The long-term health of the whole agricultural sector depends on making the marketing environment stable and profitable for the people who feed the country.

Table 3. Challenges Facing by Rice Farmers (Marketing).

Indicators	Weighted Mean	Verbal Interpretation
Marketing:		
1 Middlemen's price manipulation	3.38	Strongly Agree
2 Price set by the government is not satisfactory	3.45	Strongly Agree
3 Market price manipulation	3.26	Strongly Agree
4 Lack of government support in marketing of produce	3.50	Strongly Agree
5 Oversupply of rice in the market that causes low price charge to farmers	3.60	Strongly Agree
6 Effect of government import policies (Rice Tariffication Law, RCEF, quantitative restrictions WTO) on price of local rice products	3.64	Strongly Agree
Average Weighted Mean	3.47	Strongly Agree

3.3.3. Technical

Rice farmers have a lot of technical problems that make it harder for them to make money and be productive (Table 4). The lack of good irrigation infrastructure is the most important of these problems, as it means that many farmers have to rely on rain that isn't always reliable. Because they depend on the seasons, they

are vulnerable to terrible climate events like floods and droughts, which can destroy an entire harvest. Farmers have a hard time managing their crop cycles and investing in modern farming methods when they don't have a reliable water source. Farmers have to deal with low-quality seeds in addition to irrigation. When people can't get certified, high-yielding, and pest-resistant varieties, they get lower yields and lower-quality produce.

This not only lowers their pay, but it also keeps the cycle of low productivity going. Also, a lot of farmers don't have access to modern agricultural training. They can't make the most of their time and adapt to changes in the environment if they don't know about things like precision farming, soil management, and new technologies. There is still a big gap, even though government agencies like NIAUPRIIS, DA-NRP, TESDA, and PhilMech offer a lot of help programs. The study showed that there are clear gaps in how resources are shared and, even more importantly, in how well farmers know about these programs. If farmers who need help the most don't know

about it or can't easily get to it, having a support system in place isn't enough. To get past these problems and make sure the agricultural sector has a bright future, farmers and government agencies need to work together in a real way. This partnership would be more than just one-way help; it would create a feedback loop where the real needs and problems of farmers on the ground would directly affect government programs. By working together, they can fill in the gaps, improve their technical skills, and ultimately make the farming community as a whole more successful and resilient in the future.

Table 4. Challenges Facing by Rice Farmers (Technical).

Indicators	Weighted Mean	Verbal Interpretation
Technical:		
1 Lack of storage facilities	3.00	Agree
2 Lack of transport vehicle	3.20	Agree
3 Lack of farm machines	3.05	Agree
4 Insufficient water supply	3.60	Strongly Agree
5 Inability to adopt agricultural modernization and post-harvest facilities	3.33	Strongly Agree
6 Lack of government support to farmers	3.15	Agree
Average Weighted Mean	3.22	Agree

3.3.4. Financial

The financial strain on farmers is probably the biggest thing that makes it hard for agricultural production to last (Table 5). It makes it hard for farmers to do well because high production costs and low market returns make it hard for them to do well. Costs for important things like fertilizers, pesticides, and high-quality seeds keep going up, and so do costs for labor. This puts farmers with little money in a tough spot: they can either cut corners on inputs, which could lead to a lower-quality harvest, or they can borrow money from informal lenders at high interest rates, which can keep them in a cycle of debt. The pressure from rising costs is made worse by a market that is unstable and doesn't offer good returns. Farmers may not be able to cover their costs even after a good harvest because of things like strong competition from imported goods, not being able to ne-

gotiate with traders, and prices that change all the time. This financial trouble affects every part of the farm operation, from the ability to buy new, more efficient equipment to the ability to use sustainable farming methods. To stop this cycle, government agencies and programs that deal with money must make giving people quick and useful help a top priority. This help shouldn't be a one-time thing; it should be a full plan that includes low-interest agricultural loans that are easy to get, fair pricing systems to protect against market fluctuations, and subsidies that lower the cost of important inputs. The government can help farmers not only keep their businesses going but also invest in the future by easing their financial burden. A farming community that is financially stable is stronger, which is important for making sure that the country's food supply is safe for many years to come.

Table 5. Challenges Facing by Rice Farmers (Financial).

Indicators	Weighted Mean	Verbal Interpretation
Financial:		
1 Sluggish return on cost of production versus sale of goods	3.60	Strongly Agree
2 Lack of capital to sustain farm needs	3.53	Strongly Agree
3 High interest charge from informal lenders	3.36	Strongly Agree
4 No available collateral for bank financing	3.00	Agree
5 High cost of inputs of production	3.70	Strongly Agree

Table 5. Cont.

Indicators	Weighted Mean	Verbal Interpretation
6 Unawareness of farmers on issues affecting their production on income and cost	3.70	Strongly Agree
Average Weighted Mean	3.48	Strongly Agree

3.4. Cost and Return Analysis

The succeeding tables reflect the cost and return analysis.

The data in **Table 6** shows a big difference in rice yields between the dry and rainy seasons. This shows how much climate and environmental conditions can affect how much food is grown. Farmers consistently grow almost twice as much rice during the dry season as they do during the wet months. A time of perfect growing conditions is mostly to blame for this amazing success. Rice plants can grow to their full potential with little stress when they get plenty of sunlight, stable temperatures, and better control over their water supply through irrigation. Because there are no major weather problems, the growing cycle is predictable, which means that the harvest will be plentiful and of high quality. The rainy season, on the other hand, brings a lot of problems that

make it very hard to grow crops. Typhoons, floods, and long periods of heavy rain are just a few examples of weather events that can happen often and without warning. These events can flood rice fields for a long time, ruining the crops and losing a lot of nutrients from the soil. Plants don't grow as well during the rainy season because they don't get enough sunlight. This makes crops more likely to get sick and pests, which like wet conditions, thrive. All of these things together make the harvest much smaller and worse. Not only are yields much lower, but the grains that are harvested are often of lower quality, which means they sell for less money. This cycle of high productivity followed by a period of struggle shows how easily farmers can be affected by changes in the weather. The dry season is a time of financial stability, but the rainy season is a time of great risk and uncertainty. This is what defines the economic and mental health of the farming community.

Table 6. Yield per season.

Months	Yields (kls.)	Average Yields (kls.)
June–October (1 st cropping)/ Rainy season	80 cavans @50 kilos	4000
December–March (2 nd cropping)/Dry season	150 cavans @ 50 kilos	7500

Note: 1 ha.

The data in **Table 7** shows that the cost of growing palay changes a lot from season to season, which makes it hard for farmers to plan their finances. The dry season usually costs more because the weather is more stable and people rely on irrigation. Farmers often choose to use more expensive hybrid seedlings during this time because the controlled environment lets them fully take advantage of the seeds' potential for higher yields. This strategic investment goes hand in hand with using more fertilizer to get the most out of the land. The end result is that you have to spend more money up front, but you expect to get a bigger and more profitable harvest. On the other hand, production costs are usually lower during the rainy season. This is not a sign of efficiency; it is a direct result of environmental risks. The information shows that it costs less to hire workers to harvest

during this time. This is directly related to the lower yields that happen when typhoons and floods happen often and hurt crops. A smaller harvest just needs less time and fewer workers to bring in, which lowers costs but also means a lot less money overall. Some farmers may also choose to use cheaper, traditional seedlings instead of hybrids when they aren't sure how well their crops will do. This is to lower their risk. Farmers have a hard time managing their money because they have to invest a lot of money in the dry season and cut costs in the rainy season. Their budgeting is not only unpredictable, but it also depends on the weather. This instability shows how important it is for farmers to be more financially literate and have access to stable financial resources that can help them deal with these seasonal ups and downs.

Table 7. Cost of Production.

Costs	Rainy Season (1 st crop) Inbred	Dry Season (2 nd crop) Hybrid
Land Preparation	6000	6000
Seedlings	2880	6600
Labor (planting)	9800	9800
Fertilizers	12,000	15200
Pesticides	8516	8516
Labor (harvesting)	8640	16,200
Total Cost	47,836	62,316

Note: per cropping.

Rice farmers can't count on their income to stay the same because it changes all the time based on the price of rice per kilo (**Table 8**). With this kind of instability, it's almost impossible to plan for the future, since one season's successful harvest can lead to a financial setback the next. When prices drop, farmers are in a bad spot because they can't even make back the money they spent to grow their crops. This lack of money puts their whole way of life at risk. The Rice Tariffication Law (RTL) has made this already bad situation much worse. The law was meant to lower the price of rice for consumers, but it has hurt local farmers in the process. The RTL has lowered the price of local palay by letting a lot of cheaper imported rice into the market. This has started a race to the bottom that domestic farmers can't win. They have to sell their crops for less than what it cost them to grow them. This policy has caused a lot of financial trouble for farmers, making many of them go deeper

into debt and making some of them think about quitting farming altogether. This constant financial stress has an effect on every part of a farmer's life, from their ability to support their family to their ability to make improvements to their farm. When they are in a bind, they have even less power to negotiate with traders, which means they are at the mercy of market forces they can't control. To solve this problem, we need to take a multi-pronged approach. Policymakers need to look again at how the RTL affects things and think about putting in place a price-support system that guarantees a minimum price for local palay. Giving farmers better market information and helping them form strong cooperatives would also give them a voice and the power to negotiate as a group. In the end, making sure that farmers have a stable and fair income is not only an economic issue; it is also a matter of social justice and food security for the country.

Table 8. Projected Income per season (2022).

	Rainy Season (1 st crop) Inbred	Dry Season 2 nd cropping Hybrid
Average yields	4000	7500
Harvest time	120 days	120 days
Price per kilogram	P18	P18
Projected net income per season	P24,164	P72,684
Price per kilogram	P15	P15
Projected net income per season	P12,164	P50,184

Note: The computation is based on projections and computed on average; it may vary with actual harvest or total weight of yields and the location as well.

The data in **Table 9** shows that ₱18 per kilo is an important market price that gives farmers a fair return on their investment and the chance to have a profitable season. But this promising future is very fragile and still very open to outside forces. The profitability is not a sure thing; it's a risky chance that could be lost in an instant by a single, terrible event. This weakness is most obvious in the important 120 days before harvest, especially when it rains. This is when the rice plants are the most mature and most likely to be hurt. Typhoons and floods

that are not planned for can wipe out an entire crop, costing farmers months of hard work and money. A strong typhoon can flatten rice fields, making it impossible to harvest them. Flooding that lasts for a long time can drown and rot the crops. El Niño can also be very bad when it doesn't rain, which can cause plants to die and not make good grains. These environmental disasters don't just lower the expected returns; they also mean losing all of the money spent on seeds, fertilizers, and labor. This puts farmers in a cycle of debt and financial trouble. Farm-

ers' hard work and dedication are basically a bet on the weather if they don't have a reliable safety net. This reality makes it clear that farmers need comprehensive risk mitigation strategies right away. These strategies should

include crop insurance that is easy to get and strong government support. This will protect farmers from the unpredictable forces of nature and make sure that a fair market price can actually lead to a sustainable livelihood.

Table 9. Cost and Return Analysis.

Cropping	ROI Net Income / Cost x 100	P18.00	ROI Net Income / Cost x 100	P15.00
Rainy Season	48,328/95,672	50.51% or 51 %	24,328/95,672	25.43% or 25%
Dry Season	145,368/124,632	116.63% or 117%	100,368/124,632	80.53% or 81%

Note: Cost and Return Analysis: Net income divided by the total cost of the investment, or ROI = Net income / Cost of investment x 100.

4. Conclusions

Based on the study's results, several important conclusions have been made about the state of rice farming in the area. Most farmers are married, middle-aged, and have a lot of kids. They also don't have much education. These farmers grow crops on plots of land that are 2 to 3 hectares in size and use old-fashioned methods, which only bring in a small amount of money each harvest. The study also found that the success of their farming efforts depends heavily on the complicated relationship between production, technical practices, marketing, and financial management. Production determines the quantity and quality of yields, technical skills enhance efficiency, marketing strategies are essential for revenue, and financial stability undergirds the sustainability of the entire sector. A major discovery is that most rice farmers don't know about the different government programs that are meant to help them with money and technical issues. This shows how important it is for government agencies to improve their communication and outreach efforts so that farmers who need help the most can get it.

The study's conclusions lead to a number of important suggestions for how to help rice farmers deal with

their problems and make sure that the agricultural sector stays strong. It is suggested that farmers engage the youth in agriculture by instructing them in contemporary methods and highlighting the significance of farming for food security. To help with this, government agencies like the Technical Education and Skills Development Authority (TESDA) and State Universities and Colleges (SUCs) should offer easy-to-access online courses and webinars about agriculture to help farmers learn more about technology and how to use it. The government also needs to make agricultural policies that are more helpful and useful. For example, they could set a competitive price for local rice to reward farmers for their hard work and give farmers financial help by extending the time they have to pay back loans and lowering the interest rates on agricultural loans. It is also very important for government agencies to make the irrigation system a top priority and expand it. This would let farmers work their land more often and greatly boost overall production. Lastly, it is suggested that both farmers and government agencies see the proposed action plan as a complete guide for improving farming activities and making support programs work better.

Table 10 summarizes the detailed action plan.

Table 10. Proposed Action Plan.

Focus Area	Objectives	Challenges/Issues	Strategies/Activities	Responsible Unit/Person	Timeline	Expected Outcome
Production	To ensure sustainable and quality produce	Lack of knowledge on cropping rotation Lack of knowledge on costing and pricing Lack of farm equipment Poor quality seeds Rotted seeds Late distribution of fertilizer subsidy	Propose cropping pattern/crop rotation strategies Outline cropping budget (inputs and prices) Equipment access Farming training programs Pest control measures and prevention mechanisms Distribution of certified seeds to eligible farmer-beneficiaries Fertilizer Discount Voucher program	PhilMech DA-NRP (National Rice Program) NIA-UPRIIS Local counterpart/Local Government Unit PhilRice	For cropping pattern, outline of budget, equipment access, distribution of certified seeds, fertilizer discount voucher—before planting season For training programs, seminar on pest control measures—it can be quarterly to upgrade farmer's skills and knowledge particularly on technology related to farming	Reduce losses Improve food quality Ensure food safety Sustainable rice supply

Table 10. Cont.

Focus Area	Objectives	Challenges/Issues	Strategies/Activities	Responsible Unit/Person	Timeline	Expected Outcome
Marketing	To ensure that there is sure market for farmer's produce at right price	Oversupply of rice leading to low price Lack of government support Unfavorable price setting Middlemen price manipulation Market price manipulation Issues on import policies	Create eligible farmer association Plan a marketing program Find a trusted buyers and sellers Market access and prices Plans for distribution Seed campaign Contact linkages/agencies to market the produce Creation of local farmer market	DA- Local counterpart/LGU LGU Farmers Association	For creation of eligible farmer association—after the training on organizing an association For marketing program, market access and prices, plans for distribution, seed campaign—before planting season For linkages/agencies to market the produce—before harvest season For creation of local farmer market—before planting seasons	Recognized farm association Competitive price and marketability of produce Reduce cost on input of production
Technical	To provide technical assistance needed by farmers to improve farming activities	Insufficient water supply Lack of farm equipment and machineries	Procurement of farm machinery, equipment and supplies Ask technical support from the government and other supporting agencies	RCEF LBP/DBP	Before planting seasons	Rice development program Expanded rice credit program
Financial	To be financially return analysis and other relevant financial concerns	Lack of capital Issues affecting income and cost of production	Acquire Financial literacy Plan the funding requirement per season Prepare financial projections	TESDA SUC LBP/DBP/Lending Institution	Quarterly to upgrade financial literacy	Financial Literate Skills on Costing and Budgeting

The data shows that there is a clear focus on giving farmers the basic knowledge and skills they need to increase their productivity and make sure they stay profitable. It's not enough to just give them tools; they need to learn how to run their farms better, understand how the market works, and deal with the complexities of their business. The tables and charts show the different government agencies, each with its own programs and projects to help farmers all over the country. These programs spell out goals, plans, and actions that are meant to meet the needs of farmers, such as giving them technical training or financial help. But the analysis also shows a big and sad truth: programs and projects by themselves are not a quick fix. The data makes it clear that farmers need more than just help; they need prices for their goods that are competitive and can actually meet their socioeconomic needs. This shows a big problem for the government. Even though it is trying hard to help farmers and has set aside billions of dollars for agriculture, these resources are often not enough to help all the farmers who need it. The agricultural community is very big, and the problems are very deep. So, even programs that are well-intentioned and have a lot of money may not be enough to make a lasting difference. Farming is complicated, and farmers face many problems, such as unpredictable weather, rising input costs, and changing market prices. Because of this, a more careful and thorough approach is needed. Planning and making deci-

sions shouldn't just be about giving money to programs. They need to think about the real-world conditions and understand that even the best-designed program can fail if a farmer can't get a fair price for their goods. Farmers can only reach their full potential when government support, competitive market prices, and a deep understanding of their specific needs all work together to make a sustainable and beneficial agricultural ecosystem.

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Institutional Review Board Statement

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Informed Consent Statement

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Data Availability Statement

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Conflicts of Interest

The author declares no conflict of interest.

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