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Adoption of Good Agricultural Practices (Gap) and their Role in Rural Development in Central Luzon: An Assessment

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APPROVAL SHEET

Republic of the Philippines
TARLAC AGRICULTURAL UNIVERSITY
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Sir:

We have the honor to inform you that ALVIN ALIADO BUTAY, a candidate for the degree DOCTOR OF PHILOSOPHY IN RURAL DEVELOPMENT, PASSED the Final Oral Examination conducted on April 15, 2026 with a rating of _____

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APPROVAL AND ACCEPTANCE

In partial fulfillment of the requirements for the degree Doctor of Philosophy major in Rural Development, this thesis proposal entitled "ADOPTION OF GOOD AGRICULTURAL PRACTICES (GAP) AND THEIR ROLE IN RURAL DEVELOPMENT IN CENTRAL LUZON: AN ASSESSMENT" prepared and submitted by ALVIN ALIADO BUTAY, has been examined and recommended for approval and acceptance.

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This piece of work is wholeheartedly dedicated to all of them.

Alvin Aliado Butay

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ABSTRACT

This study assessed the adoption of Good Agricultural Practices (GAP) and its influence on rural development among rice farmers in Central Luzon, Philippines. Specifically, it described the socio-demographic, institutional, biophysical, and economic characteristics of GAP adopters; determined their level of awareness, training exposure, and certification status; examined the extent of GAP adoption and practice; and analyzed the factors influencing adoption, including enabling conditions, barriers, challenges, and potential interventions for improvement.

A total of 102 rice farmers were surveyed using structured questionnaires. Data were analyzed using descriptive statistics, correlation, and regression analysis. The respondents were generally small- to medium-scale farmers, predominantly male, married, and experienced in rice farming. Most had access to irrigation facilities, moderate soil fertility, and were affiliated with farmer organizations. Although production costs had increased over time, yields and income remained relatively stable, suggesting that farm management practices were adaptive.

Results revealed a very high level of awareness among farmers regarding GAP principles, benefits, and requirements. Most respondents had participated in GAP-related training, which was perceived as highly relevant and practical to farm operations. The extent of GAP adoption was consistently great, particularly in areas such as farm safety practices, record-keeping, sanitation, and integrated pest management. Statistical analysis showed that training exposure significantly influenced GAP adoption, whereas awareness and certification alone did not.

Key enabling factors included strong institutional support, access to irrigation, and high levels of knowledge. However, major constraints such as labor-intensive practices, inadequate infrastructure, financial limitations, and weak market incentives hindered the full optimization of GAP implementation. The study concludes that while GAP is widely adopted and contributes to sustainable agricultural development, its effectiveness largely depends on continuous hands-on training, strong institutional support, and improved infrastructure and market systems.

Overall, strengthening practical training programs, improving support for certification mechanisms, and enhancing market linkages are essential to sustain and further improve GAP adoption among rice farmers in Central Luzon.

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BIOGRAPHICAL SKETCH

The researcher was born on October 1, 1985, in Barangay Don Ramon, Anao, Tarlac. He is the eldest of three children of Mr. Dominador Riolada Butay and Mrs. Erlina Aliado Butay.

He completed his elementary education at Anao Central Elementary School in 1998 and his secondary education at Anao National High School, Anao, Tarlac, in 2002. He earned his Bachelor of Science in Agriculture, major in Crop Protection, at Central Luzon State University (CLSU) in 2006, and his Master of Science in Agriculture, major in Agronomy, at Tarlac Agricultural University (formerly Tarlac College of Agriculture) in 2013. He is a licensed Agriculturist under the Board of Agriculture of the Professional Regulation Commission (PRC).

In 2007, he was hired as an Agricultural Technologist at the Municipal Agriculture Office of the Local Government Unit of Anao, Tarlac, and became the Municipal Agriculturist in the same office from July 2017 to October 6, 2025.

The researcher is happily married to Maricar Carlos Butay and is blessed with two kind and loving children, Vin Adriane Carlos Butay and Vin Karl Carlos Butay.

With a strong desire for professional development, he is currently enrolled at Tarlac Agricultural University, pursuing the degree Doctor of Philosophy major in Rural Development.

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Researcher

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CHAPTER ONE
INTRODUCTION

Rice farming remains a central component of the Philippine agricultural economy, particularly in Central Luzon, which is widely recognized as the nation's primary rice-producing region. Historically, agricultural systems in the country have relied heavily on traditional, manual farming methods. While these indigenous practices are deeply rooted in the local agricultural heritage, they are inherently vulnerable to unpredictable weather patterns and lack the efficiency of modern technological integration, often resulting in inconsistent crop yields and volatile farm incomes.

Over the past several decades, the Philippine agricultural sector has undergone significant modernization. The transition from manual tillage to mechanized farming, alongside the adoption of improved high-yielding seed varieties and technology-assisted systems, has aimed to optimize production. Despite these advancements, smallholder and commercial farmers continue to confront systemic challenges. Issues such as soil degradation, climate variability, persistent pest infestations, and the escalating cost of agricultural inputs threaten overall farm productivity and the long-term sustainability of the sector.

In response to these systemic constraints, Good Agricultural Practices (GAP) have been institutionalized as a holistic, science-based framework. GAP provides a standardized set of guidelines designed to optimize sustainable crop production, minimize environmental degradation, and ensure food safety and worker welfare. The framework mandates responsible land use, efficient water and soil nutrient management, and the calibrated application of agrochemicals. By adhering to GAP standards, farmers can produce safer, higher-quality commodities while simultaneously qualifying for formal certification, which facilitates access to premium markets and enhances consumer confidence.

The adoption of GAP extends beyond individual farm efficiency; it serves as a critical mechanism for broader rural development. Transitioning to GAP-compliant systems integrates farmers into a more resilient agricultural value chain, promoting food security, environmental stewardship, and localized economic growth. By improving production efficiencies and market competitiveness, GAP implementation strengthens farming communities and serves as a viable pathway for poverty reduction in rural areas.

Furthermore, the systematic practice of GAP directly contributes to farmer welfare by stabilizing income streams and mitigating production risks. From a public health perspective, it ensures that local agricultural outputs align with stringent national and international food safety standards, thereby protecting consumers and enhancing the export competitiveness of Philippine agricultural products.

Given its status as a major agricultural hub, Central Luzon presents a highly relevant locale for evaluating the regional implementation of GAP. Assessing the current extent of adoption, identifying the operational constraints faced by farmers, and measuring the resulting socio-economic impacts can yield critical empirical data. Such insights are essential for policymakers, agricultural extension workers, and institutional stakeholders tasked with designing targeted interventions.

Ultimately, this assessment seeks to evaluate how the transition toward sustainable, GAP-compliant farming systems drives inclusive rural development, empowers local producers, and contributes to a food-secure Philippines. This transition aligns with the core institutional mandate of agricultural advancement—embodied in the philosophy of AGPATANUR (to rise)—demonstrating the capacity of the agricultural sector to evolve through science-based innovations and sustainable practices.

➢ *Statement of the Problem*

This study aimed to assess the extent to which the adoption of Good Agricultural Practices (GAP) influenced rural development in Central Luzon. Specifically, it sought to answer the following questions:

- What were the characteristics of the GAP adopters in terms of the following factors:

✓ Socio-demographic factors: age, sex, civil status, educational attainment, tenurial status, farming experience, and membership in a farmers' organization;
✓ Institutional factors: farm size and distance of the farm to the nearest market;
✓ Biophysical factors: source of irrigation and soil fertility status (N, P, and K); and
✓ Economic factors: previous and current production costs, and previous and current yields?

- To what extent did socio-demographic, institutional, biophysical, and economic factors influence the overall adoption and practice of GAP?
- What was the level of awareness among GAP adopters regarding the principles, benefits, and requirements of Good Agricultural Practices?

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- What was the extent of training exposure among GAP adopters in terms of the frequency, type, and relevance of the trainings attended?
- What was the extent of GAP adoption and practice among the respondents?
- To what extent did the levels of awareness, training exposure, and certification status influence the overall adoption and practice of GAP?
- What enabling factors and barriers affected the adoption of GAP?
- What challenges and constraints did farmers experience in adopting GAP?
- What strategies or interventions were proposed to improve the adoption of GAP?

➢ *Objectives of the Study*

Generally, the main objective of this study was to assess the adoption of GAP and its impact on rural development among rice farmers in Central Luzon.

- *Specifically, this Study:*

✓ Described the socio-demographic characteristics, institutional factors, biophysical factors, and economic factors;
✓ Determined the levels of awareness of GAP adopters in terms of principles, benefits, and requirements;
✓ Assessed the training exposure of GAP adopters in terms of frequency, type, and relevance of training attended;
✓ Described the GAP adopters in terms of the extent of adoption and practice of GAP;
✓ Determined the extent to which the socio-demographic, institutional, biophysical, and economic factors influenced the overall adoption and practice of GAP;
✓ Determined the extent to which the levels of awareness, training exposure, and certification influenced the overall adoption and practice of GAP;
✓ Identified the enabling factors and barriers affecting the adoption of GAP among rice farmers;
✓ Identified the challenges and constraints encountered by farmers in adopting Good Agricultural Practices;
✓ Recommended strategies or interventions that may improve and sustain the adoption of Good Agricultural Practices among rice farmers in Central Luzon.

➢ *Hypothesis of the Study*

The study tested the underlying premise that various factors influenced the adoption and utilization of Good Agricultural Practices (GAP) among rice farmers in Central Luzon. Specifically, the following hypotheses were tested:

Null Hypothesis (H_0): The socio-demographic characteristics, institutional factors, biophysical factors, economic factors, as well as the levels of awareness, training exposure, and certification status, do not significantly influence the extent of adoption and practice of Good Agricultural Practices (GAP) among rice farmers in Central Luzon.

Alternative Hypothesis (H_1): The socio-demographic characteristics, institutional factors, biophysical factors, economic factors, as well as the levels of awareness, training exposure, and certification status, have a significant influence on the extent of adoption and practice of Good Agricultural Practices (GAP) among rice farmers in Central Luzon.

➢ *Significance of the Study*

Results of this study may offer valuable insights for various stakeholders involved in agricultural development in Central Luzon.

To the Farmers and Cooperatives: The study highlights the tangible economic and operational benefits of adopting GAP, encouraging wider compliance and more sustainable farm management.

To Policymakers: The findings provide empirical data that can be utilized to design more effective agricultural policies and extension programs geared toward sustainable farming and inclusive rural development.

To the Academe: The results of this study contribute to the existing body of literature, fostering a deeper theoretical and practical understanding of the dynamics surrounding sustainable agricultural adoption and rural development.

To Extension Services and Non-Governmental Organizations (NGOs): The findings serve as a strategic guide for extension service providers, equipping them to tailor relevant interventions, training designs, and support systems to meet the specific needs of smallholder farming communities, thereby maximizing the impact of GAP implementation.

➢ *Scope and Delimitation's of the Study*

This study assessed the adoption of Good Agricultural Practices (GAP) and its impact on rural development among rice farmers in Central Luzon. The scope of the research was strictly limited to the seven provinces of the region where active GAP training

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programs were implemented. The primary subjects of the study focused exclusively on rice farmers who had been exposed to GAP, whether individually registered or affiliated with agricultural cooperatives.

Consequently, the delimitations of this study established that the findings may not be widely generalized to large-scale corporate agribusinesses, farmers operating outside the Central Luzon region, or agricultural producers engaged in other types of commodities. These boundaries were purposefully set to maintain a focused, manageable, and context-specific scope, acknowledging the inherent limitations regarding the broader applicability of the results.

- *Definition of Operational Terms*

The following terms were defined operationally to clarify their specific use in this study:

- Good Agricultural Practices (GAP). In this study, GAP refers to a systematic set of farming methods and principles applied by rice farmers to ensure food safety, environmental protection, and worker welfare. It encompasses proper soil management, the safe use of farm inputs, systematic waste disposal, and proper post-harvest handling practices based on established PhilGAP standards.
- PhilGAP. This denotes the Philippine Good Agricultural Practices certification system developed and implemented by the Department of Agriculture. Within the context of this research, it signifies the official recognition granted to farmers who strictly comply with national GAP standards for crop production.
- Adopter. An adopter is operationally defined as a rice farmer who actively and consistently applies GAP-compliant methods in their farm operations. This status is evidenced by the documented use of approved techniques in crop management, chemical handling, and post-harvest activities..
- Certification. This refers to the formal acknowledgment issued by the Department of Agriculture to farmers who successfully meet all PhilGAP criteria and pass the rigorous evaluation process. In this assessment, certification serves as the verified proof of a farmer's compliance with GAP standards.
- Rural Development. Operationally, this refers to the measurable improvement in the economic, social, and environmental conditions of farming communities resulting from GAP adoption. Key indicators include increased farm income, enhanced resource sustainability, and expanded livelihood opportunities.
- Sustainable Practices. This encompasses the specific, ecologically sound farming techniques employed by GAP adopters designed to minimize environmental degradation, conserve natural resources, and maintain soil and water health, thereby ensuring long-term agricultural productivity.

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CHAPTER TWO
REVIEW OF RELATED LITERATURE AND STUDIES

This portion presents the related literature and related studies which were relevant and related to the study conducted.

➢ *Related Literature*

- *PhilGAP Objectives and Legal Framework*

The Philippine Good Agricultural Practices (PhilGAP) program promotes the production of safe and high-quality crops while ensuring environmental sustainability and worker welfare. Spearheaded by the Bureau of Plant Industry (BPI) under the Department of Agriculture (DA), PhilGAP focuses on maintaining food safety across the entire value chain, from farm to market. Its statutory foundation lies in Republic Act No. 10611, otherwise known as the Food Safety Act of 2013, which institutionalizes food safety standards to protect consumer health and enhance the market competitiveness of local farmers. Through PhilGAP, the national government aims to align domestic agricultural systems with stringent international safety and sustainability benchmarks (Official Gazette of the Republic of the Philippines, 2013; Food and Agriculture Organization & World Health Organization, 2019).

- *Reports of Local Agricultural Extension and National Data on PhilGAP Certification Rate*

Efforts to modernize Philippine agriculture have placed an increasing emphasis on PhilGAP certification. Farmers who obtain this certification demonstrate verifiable compliance with practices that mitigate environmental risks and elevate food safety protocols. In Central Luzon, for example, over two hundred rice and crop farmers have been formally recognized by the BPI for their consistent adherence to PhilGAP standards. This milestone indicates the growing awareness and institutional recognition of sustainable farming within the region. Such initiatives illustrate the government's ongoing trajectory toward agricultural modernization through safety-oriented and environmentally responsible production systems (Department of Agriculture Regional Field Office III [DA-RFO III], 2025).

- *Agricultural Modernization Policies*

The modernization of Philippine agriculture is supported by several robust policy frameworks, most notably Republic Act No. 8435, or the Agriculture and Fisheries Modernization Act of 1997 (AFMA). This legislation promotes a technology-driven and market-oriented agricultural sector designed to sustainably increase productivity, profitability, and global competitiveness. AFMA underscores the critical importance of research, training, and institutional support in enabling farmers to transition from traditional, resource-based practices to advanced, knowledge-based production systems. These foundational principles simultaneously underpin the core objectives of the PhilGAP program (Department of Agriculture, 2025).

- *Role of Agricultural Extension Services*

Agricultural extension services serve as the critical conduit between overarching government policies and grassroots implementation. Through targeted training, systematic information dissemination, and hands-on technical assistance, extension agents empower smallholder farmers to adopt new technologies and sustainable agricultural practices. Empirical studies have consistently shown that robust extension services significantly improve farmers' productivity, operational sustainability, and income levels by facilitating the practical application of innovations, such as post-harvest technologies and GAP-based farm management systems (Anderson & Feder, 2004; Birner et al., 2009; Davis et al., 2012). Consequently, extension support plays an indispensable role in strengthening farmer capability and promoting resilient rural livelihoods.

- *Socio-economic Drivers of GAP Adoption*

Socioeconomic conditions heavily influence the adoption of GAP among Filipino farmers. Research highlights that specific factors—such as higher educational attainment, secure farm ownership, reliable access to irrigation, and active participation in farmer organizations—significantly enhance the likelihood of adoption (Banzon, Mojica, & Cielo, 2013; Mariano, Villano, & Fleming, 2012; Digal & Placencia, 2019). Furthermore, institutional support from both government and private agencies, coupled with market incentives and the perceived economic benefits of certification, actively encourage farmer participation. Conversely, challenges such as high compliance costs, complex and bureaucratic certification procedures, and limited grassroots awareness remain substantial barriers (González, Hernandez, & López, 2015). These dynamics suggest that the ultimate success of GAP programs is determined by a complex interplay of individual farmer characteristics and systemic institutional support mechanisms.

- *Environmental Significance of GAP*

Good Agricultural Practices contribute not only to public health and food safety but also to vital environmental sustainability. Agronomic studies indicate that farms strictly following GAP principles report improved soil fertility, enhanced water retention, and increased microbial activity, alongside a marked reduction in localized pollution stemming from agrochemical use (Pretty, Toulmin, & Williams, 2011; Paragas et al., 2023). In regions such as Central Visayas, farmers implementing GAP-aligned agroecological models have successfully achieved a balance between economic profitability and ecological preservation (Paragas et al., 2023). These findings emphasize that GAP adoption serves as a scientifically sound pathway toward environmentally responsible farming and long-term natural resource preservation.

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- *Comparative Insights from ASEAN Countries*

Across Southeast Asia, the adoption of GAP has been elevated to a regional priority under the ASEAN Good Agricultural Practices (ASEAN GAP) framework. Nations such as Thailand, Vietnam, and Malaysia have aggressively integrated GAP into their national agricultural systems, leveraging formal certification to secure improved market access and ensure transnational food safety. Similarly, Cambodia, through its CamGAP initiative, is actively working to align its domestic standards with these international benchmarks to enhance its competitive advantage and build farmer capacity (Food and Agriculture Organization of the United Nations [FAO], n.d.) . This shared regional experience demonstrates that adopting harmonized GAP systems not only standardizes product quality and environmental performance but also unlocks significant economic opportunities by facilitating access to lucrative regional and global markets.

➢ *Related Studies*

- *Empirical Research on GAP in Asia*

Research across Asia consistently demonstrates that the adoption of Good Agricultural Practices (GAP) contributes to productivity, sustainability, and inclusive rural growth. In Thailand, Krause et al. (2016) noted that GAP-certified mango producers accessed premium export markets and achieved higher farm-gate prices, although the benefits varied by commodity and certification level (Krause et al., 2016). Similarly, Sriboonchitta and Wiboonpongse (2019) reported that GAP programs in Northern Thailand strengthened farmer cooperatives, improved traceability systems, and enhanced consumer trust, particularly in food safety-sensitive markets.

Beyond the Philippines, studies in Vietnam and Indonesia indicate that GAP implementation improves household incomes and strengthens women's participation in agricultural value chains. In Malaysia, Rahim et al. (2022) highlighted that farmers practicing MyGAP (Malaysia's national GAP standard) achieved higher yields and reduced pesticide use, proving that national programs can lead to measurable improvements in both productivity and environmental protection.

Modern literature increasingly positions GAP as a cornerstone for Climate-Resilient Agriculture (CRA). In the Philippine context, where smallholders face heightened vulnerability to extreme weather events, GAP-aligned practices—such as integrated pest management (IPM) and structural soil conservation—serve as critical adaptation strategies. Research indicates that while the adoption of sustainable practices is often motivated by a desire to mitigate climate-related losses, the transition is frequently impeded by high initial labor costs and inadequate rural infrastructure (CARI Journals, 2025). Nonetheless, when integrated with broader national strategies, GAP provides a standardized framework that enhances farm-level adaptive capacity and long-term ecological balance (SEARCA, 2025).

- *Philippine Context and Implementation Drivers*

In the Philippines, Banzon et al. (2013) identified institutional support, export demand, and organizational participation as key drivers of PhilGAP adoption, emphasizing the role of both public and private extension networks (Banzon et al., 2013). However, their study also revealed persistent challenges such as high certification costs, a lack of technical know-how, and limited incentives for small-scale producers (Banzon et al., 2013). Further research by Digal and Placencia (2018) highlighted that education, gender, and farming experience significantly shape farmers' willingness to adopt sustainable practices, pointing to the importance of human capital and inclusivity in agricultural innovation (Digal & Placencia, 2018).

Recent studies emphasize that agricultural innovation is not gender-neutral; rather, the adoption of GAP standards is deeply influenced by household power dynamics. Research into Southeast Asian value chains reveals that female-headed households often encounter unique systemic barriers, including smaller average landholdings and limited access to technical extension services (Frontiers, 2025). To achieve universal PhilGAP adoption, the literature suggests a shift toward inclusive extension models that account for women's time constraints and promote the involvement of female agricultural officers, thereby ensuring that the economic benefits of certification are distributed equitably across the rural workforce.

Recent evidence from Bas-ong et al. (2024) suggests that while awareness of GAP is moderate among vegetable farmers, adoption remains low due to management difficulties, despite the significant potential for increased return on investment (ROI) compared to traditional methods (Bas-ong et al., 2024). In terms of organizational structure, Dela Cruz et al. (2022) emphasized the potential of cooperative-led schemes to reduce costs and promote group compliance, enabling more smallholders to access certification benefits (Dela Cruz et al., 2022).

- *Economic Impacts of GAP Adoption*

Studies on GAP consistently emphasize its importance in improving the economic, environmental, and social outcomes of farming. Recent empirical studies demonstrate that GAP adoption can improve farm-level profitability, though returns vary by crop, scale, and market access. Research indicates that GAP adoption enhances farm profitability by improving yield, reducing post-harvest losses, and allowing farmers to access premium and institutional markets (Limbaga et al., 2022).

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- *Food Safety, Product Quality, and Market Access*

GAP and PhilGAP emphasize food safety, traceability, and hygienic handling—factors that enable farmers to enter institutional and higher-value markets (DA-BAFS, 2024). The implementation of PhilGAP standards ensures that agricultural products comply with national and international food safety regulations. However, many smallholders still face barriers to certification due to complex documentation, audit requirements, and strict retailer demands (DA-BAFS, 2024).

- *Regional Policy Implementation: The Central Luzon Case*

Within the strategic agricultural hub of Central Luzon, recent policy initiatives provide a model for "institutional trust" as a driver of certification. As of early 2026, the Department of Agriculture (DA) Regional Field Office III has intensified its certification campaigns through high-visibility recognition programs and cooperative-based support systems (PIA, 2026). Case studies of successful cooperatives in Nueva Ecija demonstrate that when local government units (LGUs) provide consistent monitoring and subsidize audit fees, renewal rates for PhilGAP certification significantly increase. This regional evidence underscores that the sustainability of GAP compliance is contingent upon a robust local policy environment that bridges the gap between national standards and smallholder realities.

- *Gaps in the Literature and Justification for the Present Study*

While several local and regional studies show positive economic, environmental, and market outcomes from GAP, the literature also reveals important gaps that justify this research.

First, there remains a lack of systematic, empirical evidence regarding the current state of PhilGAP certification within the specific socioeconomic landscape of Central Luzon. While national-level reports provide broad overviews, disaggregated data concerning certification accessibility, granular cost-benefit structures, and the factors influencing long-term compliance among the region's smallholders are significantly underrepresented.

Second, current scholarship often operates within methodological silos. Many studies focus exclusively on quantitative metrics—such as yield increases or renewal rates—while others provide purely qualitative accounts of farmer attitudes. There is a notable scarcity of integrated, mixed-methods research that triangulates quantitative performance indicators with qualitative insights into institutional bottlenecks. This study addresses this by bridging the gap between numerical compliance scores and the lived experiences of farmers to produce more nuanced policy recommendations.

Finally, while existing program evaluations confirm immediate farm-level gains, peer-reviewed analyses that connect GAP adoption to wider indicators of rural development—including household welfare, rural employment, and community-level resilience—remain sparse. By examining these broader socio-economic outcomes, this assessment aims to fill a vital evidence gap, moving the discourse beyond simple certification counts toward a holistic understanding of GAP as a vehicle for inclusive agricultural transformation.

- *Conceptual Framework*

The study is grounded in Rogers' Diffusion of Innovations theory, which outlines the process of awareness, evaluation, and adoption of new practices. It also incorporates the Sustainable Livelihoods Framework, which connects human, social, and financial capital through adoption processes to livelihood outcomes. The framework conceptualizes the pathway as follows: inputs—such as farmer profiles, institutional factors, biophysical factors, economic factors, awareness of GAP, training exposure, and certification status—influence the adoption of Good Agricultural Practices (GAP). This adoption leads to outputs, including increased crop yields, more efficient production practices, reduced costs, and certification attainment, which in turn result in sustained GAP compliance and rural development among rice farmers in Central Luzon.

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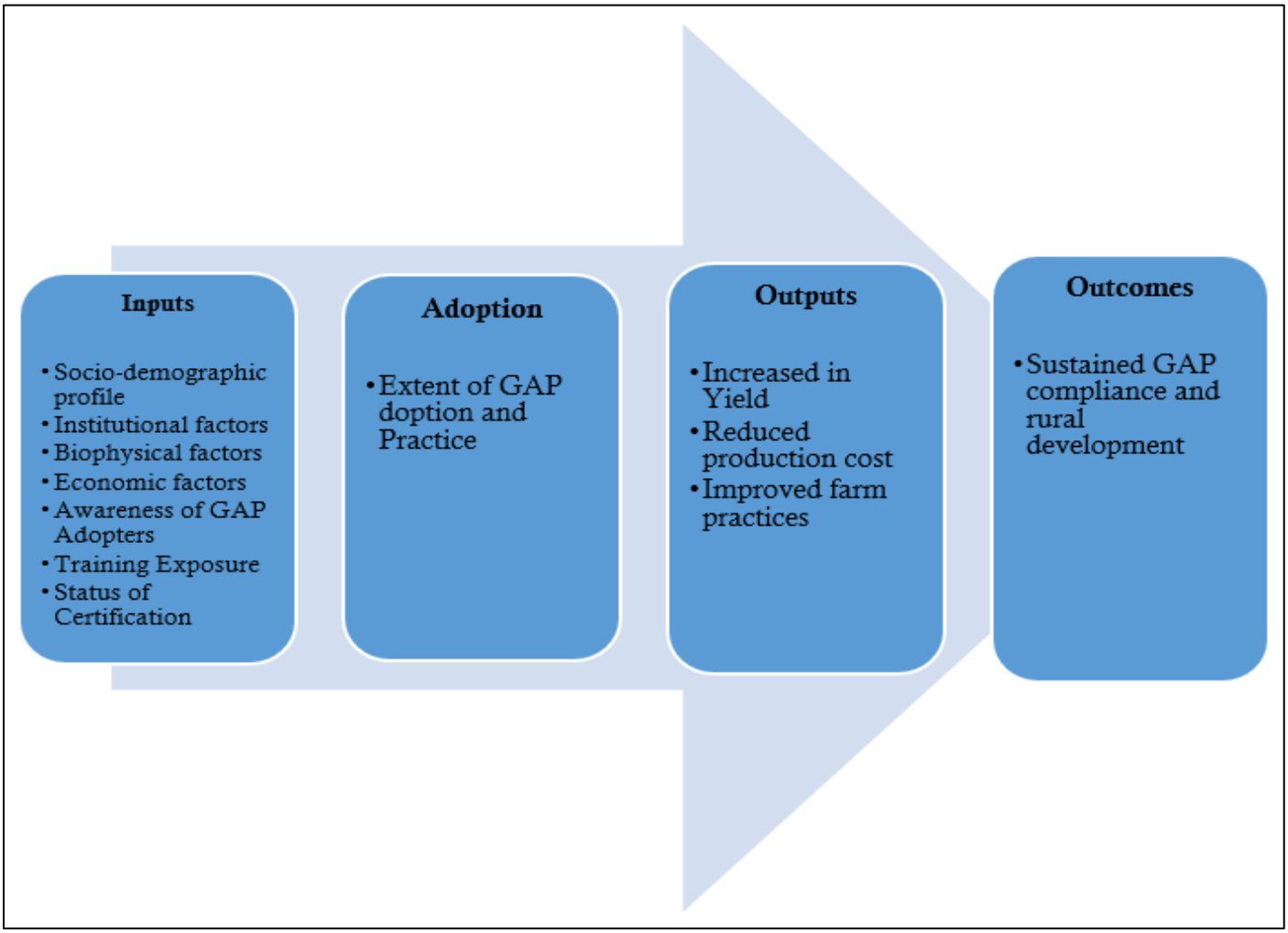

Fig 1 Conceptual Framework of the Study

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CHAPTER THREE
METHODS AND PROCEDURES

➢ *Research Design*

This study employed a quantitative research design to assess the adoption of Good Agricultural Practices (GAP)—a set of methods aimed at improving farm productivity and sustainability—among rice farmers in Central Luzon. Data were collected through a structured questionnaire to obtain measurable information on farmers' socio-demographic characteristics, farm profiles, levels of awareness, training exposure, certification status, and the extent of GAP adoption. The quantitative approach allows for objective statistical analysis of the relationships between independent variables (awareness, training, certification) and the dependent variable (extent of GAP adoption).

Key Informant Interviews (KIIs, structured interviews with individuals with specialized knowledge) were conducted solely to validate the survey instrument prior to administration, not as a source of data for analysis.

➢ *Locale of the Study*

The study was conducted across seven provinces in Central Luzon, covering the period from the initial adoption of Good Agricultural Practices (GAP)—a set of standards for safe and sustainable agriculture—through to the present. These areas were selected for the presence of GAP-certified rice farms and for farmers' active participation in training programs conducted by the Department of Agriculture (DA) in Region III. This provided a comprehensive basis for assessing the adoption and impact of GAP among local farmers.

Fig 2 Map of Central Luzon (Region III)

➢ *Respondents of the Study*

The primary respondents were GAP-certified rice farmers registered under the Department of Agriculture–Regional Field Office III (DA-RFO III) as of July 2025. These farmers provided quantitative data to the researcher regarding their adoption of GAP practices, socio-economic conditions, and certification experiences.

The agricultural officers and extension workers served as Key Informants who were consulted prior to survey administration to validate the instrument and ensure clarity and relevance of the questionnaire items. Their feedbacks were not analyzed as research data.

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➢ *Sampling Design and Techniques*

A complete list of farmers was obtained from the Department of Agriculture–Regional Field Office III and served as the sampling frame (the group from which respondents are chosen) for the study. From this list, respondents were selected using stratified random sampling (a method that divides the population into subgroups and randomly selects participants from each) to ensure a representative, unbiased sample of GAP-certified farms across Central Luzon. Each province was treated as a distinct stratum (subgroup) to capture variations in farm characteristics and levels of GAP adoption.

Stratified random sampling enabled proportional representation of farmers from each province. This improved the reliability and validity of the data. The approach also minimized sampling bias and ensured all subgroups were adequately represented.

The required sample size was determined using the sample size estimation for proportions formula, which is appropriate for studies aiming to estimate population characteristics at a specified level of precision and confidence. The formula used is presented as follows:

$$n = \frac{N(Z_{1-\frac{\alpha}{2}})^2 p(1-p)}{Nd^2 + (Z_{1-\frac{\alpha}{2}})^2 p(1-p)}$$

Where:

- n = sample size
- N=138 (total population)
- Z=1.96 (Z-value for 95% confidence level)
- p=0.5 (assumed proportion to maximize sample size)
- d=0.05 (margin of error)

As a result, 102 rice farmers from the seven provinces of Central Luzon were selected. The number of respondents per province was determined through proportional allocation to maintain representativeness.

Proportional allocation per province was used to ensure proportional representation. The total sample size (102) was distributed to each province based on the number of GAP-certified farms in that province using the following formula:

$$n_i = \frac{nN_i}{N}$$

Where:

- $n_i =$ sample size for stratum
- $n =$ sample size
- N_i = population size of stratum
- N=population size

This ensures proportional selection from each stratum, accurately representing provinces.

Moreover, the researcher interviewed agricultural officers and extension workers to understand the nature and effectiveness of institutional support, outreach programs, and policy implementation for GAP. These respondents were given context on regional trends and barriers from either an administrative or technical perspective. GAP-certified producers were assessed on how certification has influenced farming practices, market access, income levels, and environmental stewardship. GAP-certified producers also provided insights into the certification process, its challenges, and its long-term sustainability. Agricultural officers, extension workers, and GAP-certified producers served as Key Informants for this study.

Table 1 Distribution of Rice Farmers per Stratum/Province

Province	Population size	Sample size
Aurora	1	1
Bataan	15	11
Bulacan	1	1
Nueva Ecija	60	44
Pampanga	8	6
Tarlac	47	35
Zambales	6	4
Total	138	102

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➢ *Data Gathering Instrument*

The primary data for this study were obtained through a structured questionnaire developed by the researcher based on the research objectives and relevant literature on Good Agricultural Practices (GAP). The instrument collected quantitative data from GAP-certified rice farmers in Central Luzon on their profiles, awareness, training exposure, certification status, the extent of GAP adoption, and the factors influencing their adoption.

The structured questionnaire consisted of six (6) sections, as follows:

The first part was the Socio-Demographic and Farm Profile. This section gathered background information about the respondents and their farms. It consisted of four (4) subparts:

- Socio-Demographic Profile – This included age, sex, civil status, educational attainment, occupation, years of farming experience, household income, household size, and membership in farmers' organizations.
- Institutional Profile – This covered farm size, land tenure status, distance to the nearest market, primary crop, type of farming system, and access to credit.
- Biophysical Profile – This included irrigation source, soil fertility status (N, P, K), and vulnerability to drought or flooding.
- Economic Profile – This was used to compare the previous and current production costs, yields, and farm income.

These items were primarily categorical and numerical and were designed to describe respondents' characteristics and farming conditions.

Following the first section, the second section focused on the Level of Awareness of GAP, measuring respondents' awareness of Good Agricultural Practices (GAP) principles, benefits, and requirements using a 5-point Likert scale.

The third section focused on Training Exposure. It determined the frequency, type, and relevance of training programs attended by GAP adopters, whether related or unrelated to GAP. A Likert-type scale was used to assess the degree of participation and the perceived usefulness of such training.

The fourth section, Extent of GAP Adoption and Practice, investigated the degree to which respondents adopted and implemented GAP principles on their farms.

The fifth section addressed the Enabling Factors, Barriers, and Challenges. This section contained both Likert-type and open-ended items that identified factors promoting or hindering GAP adoption, as well as the challenges farmers faced in maintaining compliance.

Finally, the sixth section, Suggested Strategies and Interventions, provided respondents with an opportunity to offer recommendations through open-ended questions. This allowed them to share ideas for improving GAP adoption and enhancing support services for rice farmers in the area.

Following the survey data collection, a Key Informant Interview (KII) was conducted to supplement and validate the findings. The KII aimed to obtain in-depth insights, clarifications, and expert opinions regarding the adoption of Good Agricultural Practices (GAP) among rice farmers in Central Luzon. Key informants were carefully selected based on their expertise, experience, and direct involvement in GAP implementation, monitoring, or support services. In this study, the key informants included officials and technicians from the Department of Agriculture Regional Field Office III (DA-RFO III), municipal agriculturists and agricultural technicians from selected municipalities, GAP-certified farmers and leaders of farmers' cooperatives or associations, and representatives from certifying bodies or partner institutions involved in GAP training and certification.

➢ *Data Gathering Procedure*

The data-gathering procedures were systematic to ensure accurate, valid, and reliable information from respondents. The procedure began by securing local approvals and permissions from relevant agencies and local government units. Before data collection, all participants provided informed consent, confirming they understood the study's purpose, procedures, and their rights, including the right to withdraw at any time without penalty.

A pilot test was given to 15–20 rice farmers outside the study area to validate the questionnaire. This ensured clarity and reliability. The internal consistency of Likert-type items was measured using Cronbach's Alpha. A coefficient of 0.70 or higher was considered acceptable. Revisions were made based on pilot results before the main data collection.

For the main data collection, survey questionnaires were distributed to GAP-certified rice farmers through personal administration, with assistance from the respective Municipal Agriculture Offices (MAOs). The research enumerators were rigorously trained to facilitate and assist the researcher during interviews, ensuring accurate responses and providing clarification when needed.

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Additionally, Key Informant Interviews (KIIs) were conducted among selected local officials, agricultural extension workers, GAP-certified farmers, and representatives from relevant institutions. These interviews aimed to obtain in-depth qualitative insights to complement and serve exclusively as a validation mechanism to ensure the survey items are relevant to the regional context of Central Luzon.

All interviews and discussions were audio-recorded, transcribed verbatim, and anonymized to protect participant confidentiality. The collected data were systematically coded, organized, and prepared for analysis in accordance with the study's objectives.

- *Units of Analysis*

The unit of analysis for this study was the individual GAP-certified rice farmers in Central Luzon. They provided data on their socio-demographic characteristics, farm profile, level of awareness, training exposure, certification status, and extent of GAP adoption and practice.

In addition, institutional stakeholders, such as agricultural technicians, municipal agriculturists, and Department of Agriculture officials, gave extra information through Key Informant Interviews (KIIs). Their input helped explain and confirm the data from individual farmers.

- *Data Analysis*

The data collected from the structured survey questionnaires were processed and analyzed using Microsoft Excel and the Statistical Package for the Social Sciences (SPSS) version 26. All tests were performed at a 5% level of significance. The statistical analyses included quantitative data, which were summarized using descriptive statistics, such as frequencies, percentages, ranks, means, and standard deviations, to characterize respondents and other variables. In contrast, Inferential statistical tests, including paired t-tests, correlation, and regression analysis, were employed to examine relationships and test hypotheses regarding GAP adoption and its impacts. Moreover, qualitative data from interviews and focus group discussions were analyzed thematically to identify recurring themes and patterns regarding farmers' attitudes, barriers to adoption, enabling factors, and perceived benefits of GAP implementation.

Table 2 Matrix of the Objective, its Needed Data, and the Method of Analysis Used in this Research, cont'd

Objective	Data Needed	Method of Analysis
1. Describe GAP adopters in terms of socio-demographic, institutional, biophysical, and economic factors	a). Socio-demographic: age, sex, civil status, education, farming experience, household income, membership in farmers' organization, b). Institutional: farm size, land tenure, distance to market, c). Biophysical: irrigation source, soil fertility (N, P, K), vulnerability to drought/flooding d). Economic: previous and current production cost, yield, and income	Descriptive statistics: frequencies, percentages, mean, standard deviation; Paired t-test for economic comparisons
2. Determine the level of awareness among GAP adopters regarding principles, benefits, and requirements of GAP	Responses to Likert-scale items on knowledge of GAP principles, benefits, and requirements	Descriptive statistics: mean, standard deviation
3. Describe the training exposure of GAP adopters in terms of frequency, type, and relevance of training attended	Training participation frequency, type, relevance rated on Likert scale	Descriptive statistics: frequencies, percentages, mean
4. Describe the extent of adoption and practice of GAP	Scores assigned to each GAP principle implemented (e.g., water management, soil fertility, pest control)	Descriptive statistics: mean, standard deviation
5. Determine the influence of socio-demographic, institutional, biophysical, and economic factors on the overall adoption of GAP	Independent variables: awareness, training exposure, certification; Dependent variable: GAP adoption scores	Multiple regression analysis
6. Determine the extent to which awareness, training exposure, and certification influence GAP adoption	Independent variables: awareness, training exposure, certification; Dependent variable: GAP adoption scores	Correlation analysis
7. Identify enabling factors and barriers affecting GAP adoption	Responses to Likert-scale items rating enabling factors and barriers	Descriptive statistics: mean, standard deviation
8. Recommend strategies or interventions to improve GAP adoption	Responses to structured Likert-scale questions on potential interventions	Descriptive statistics: mean, standard deviation

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- *Ethical Consideration*

This study strictly followed the ethical principles to protect and respect all participants. Before participating, respondents were informed about the study's purpose and the confidentiality of their responses. Their voluntary consent was sought, and all information gathered was used solely for academic purposes. Respondents' names and farm identities were kept anonymous to ensure privacy and compliance with ethical research standards. Confidentiality and privacy were maintained by anonymizing responses and securely managing all data to prevent identifying individuals. The researcher actively interacted with the respondents, being respectful and sensitive to local customs, and minimizing any potential harm or discomfort to participants. Moreover, this study sought approval from the TAU Ethics Review Committee (ERC) to ensure adherence to ethical standards for research involving human subjects. The collected data were used solely for this research and responsibly shared with stakeholders to support sustainable agricultural development.

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CHAPTER FOUR
RESULTS AND DISCUSSIONS

This chapter presents the study's results, along with the corresponding analysis and interpretation of the data gathered from respondents. These findings include the sociodemographic, institutional, and economic characteristics of the respondents, as well as the farms' biophysical factors.

The chapter also describes the levels of awareness among adopters regarding the principles, benefits, and requirements of Good Agricultural Practices (GAP). Furthermore, it details adopters' training exposure in terms of frequency, type, and relevance, and evaluates the extent of GAP adoption and practice.

Finally, the study determines the influence of sociodemographic, institutional, biophysical, and economic factors on overall GAP adoption; assesses the extent to which awareness, training exposure, and certification influence adoption; and identifies the enabling factors and barriers affecting this process. Recommended strategies and interventions to improve GAP adoption are also presented.

- *Description of Farmers' Socio-Demographic Characteristics*

This section presents the sociodemographic profile of the respondents, providing a foundation for understanding their personal and household characteristics. Variables such as age, sex, and civil status are essential in analyzing the composition of the respondents, as these factors may influence decision-making, levels of participation, and the adoption of Good Agricultural Practices (GAP).

Understanding these characteristics is crucial for contextualizing the results and identifying patterns that may affect the implementation and sustainability of agricultural programs.

- *Age*

Table 3 shows that a significant portion of respondents belongs to the older age groups: 46.08% are 61 years old and above, followed by 28.43% in the 51–60 age bracket. Only 18.63% fall within the 41–50 age group, and a small minority of 6.86% are 40 years old or below. This indicates that the majority of GAP-certified rice farmers in Central Luzon are older individuals with extensive experience in rice farming. This predominance suggests that agricultural knowledge and decision-making are largely concentrated among seasoned farmers, which may influence farming practices and productivity (FAO, 2011; World Bank, 2014).

However, the relatively small representation of younger farmers may pose a challenge for the long-term sustainability and continuity of farming, as the agricultural sector faces a potential generational gap (Philippine Statistics Authority, 2018).

Table 3 Socio-Demographic Profile of the Respondents

Characteristics	Frequency	Percentage (%)
Age		
40 years old and below	7	6.86
41-50	19	18.63
51-60	29	28.43
61 years old and above	47	46.08
Total	102	
Sex		
Male	69	67.65
Female	33	32.35
Total	102	
Civil Status		
Single	4	3.92
Married	80	78.43
Widowed	16	15.69
Separated	2	1.96
Total	102	

- *Sex*

Table 3 likewise presents the gender distribution of the respondents. Regarding sex, the majority of respondents were male (67.65%), and females accounted for 32.35%. This finding reflects the male-dominated nature of rice farming in the study area, consistent with traditional gender roles where men are primarily responsible for farm management and decision-making (Boserup, 1970; FAO, 2011). Although fewer in number, female respondents play a crucial role in supporting farm operations, household food

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security, and complementary agricultural activities, highlighting the importance of recognizing women's contributions to farming (World Bank, 2014).

This gender distribution underscores the need to consider gender dynamics when designing extension programs and interventions for farmers, ensuring that both men and women have equitable access to relevant training and support.

- *Civil Status*

Regarding civil status, the same table reveals that the majority of the respondents were married, accounting for 78.43% of the total sample. This was followed by widows (15.69%), while only a small proportion were single (3.92%) or separated (1.96%). The high percentage of married respondents indicates that most farmers have established family responsibilities, which may influence their farming decisions, resource allocation, and level of participation in agricultural activities. Being married may also provide additional labor support from family members, contributing to farm productivity and sustainability (Boserup, 1970; FAO, 2011).

Conversely, the presence of widowed respondents indicates that some farmers continue to engage in agricultural activities despite potential challenges, such as reduced household labor or financial constraints (Deininger & Olinto, 2000). The relatively low proportion of single and separated individuals further suggests that farming in the study area is predominantly a family-based activity that relies heavily on household support. Overall, the distribution of civil status underscores the importance of family structure in agricultural practices and decision-making among the respondents, particularly in ensuring the continuity and adoption of farm innovations such as GAP (World Bank, 2014).

- *Number of Household of the Respondents*

Table 4 presents the household composition of the respondents. The data reveal that the largest proportion of respondents (48.04%) belonged to households with 4 to 6 members, followed by those with 1 to 3 members (44.12%). Only a small minority (7.84%) reported having 7 or more household members.

Table 4 Number of Household and Educational Attainment of the Respondents

Characteristics	Frequency	Percentage (%)
Household size		
1-3	45	44.12
4-6	49	48.04
7 and above	8	7.84
Total	102	
Educational Attainment		
Elementary graduate	11	10.78
High school graduate	36	35.29
Vocational/Technical	14	13.73
College Level	10	9.80
College Graduate	31	30.39
Total	102	

The study's results affirm the FAO's findings, which emphasize that household size is a critical factor in farming communities. Larger households often possess greater labor capacity, which can enhance farm productivity and sustainability (FAO, 2011; Philippine Statistics Authority, 2018). Conversely, smaller households may face challenges regarding labor availability, necessitating external support or adjustments in farm management practices.

- *Educational Attainment of the Respondents*

Regarding educational attainment, Table 4 reveals a diverse educational background among the respondents. The largest single group is high school graduates (35.29%), followed by college graduates (30.39%). Interestingly, more than half of the respondents (53.92%) have pursued some form of post-secondary education, encompassing vocational or technical training (13.73%), college-level studies (9.80%), and completed college degrees (30.39%). Meanwhile, a smaller portion of the respondents (10.78%) are elementary school graduates.

Educational level is a critical determinant of farmers' ability to understand and adopt modern agricultural practices, including Good Agricultural Practices (GAP) (World Bank, 2014). Farmers with higher educational attainment are generally more receptive to technical training, innovation, and sustainable farming practices, which may directly influence their farm productivity and compliance with agricultural standards.

These findings highlight the need for tailored extension programs that account for varying levels of literacy and technical knowledge, ensuring that all farmers, regardless of educational background, can participate effectively in capacity-building activities and farm improvement initiatives.

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➢ *Tenurial Status*

The tenurial status of the respondents was assessed to understand land ownership and access, key factors influencing farm management, productivity, and decision-making. As shown in Table 5, the majority of respondents (63.73%) own the land they cultivate, while 34.31% were tenants, and a small proportion (1.96%) operated under stewardship agreements.

Table 5 Tenurial Status of the Respondents

Attribute	Frequency	Percentage (%)
Owned	65	63.73
Tenant	35	34.31
Stewardship	2	1.96
Total	102	

Land ownership provides farmers with greater security and autonomy, allowing them to make long-term investments in farm improvements, adopt sustainable practices, and implement innovations such as Good Agricultural Practices (GAP) without fear of displacement (FAO, 2011; Deininger & Olinto, 2000). On the other hand, tenant farmers may face constraints in decision-making and long-term planning due to limited control over the land, which can affect their willingness to invest in productivity-enhancing measures (World Bank, 2014).

Furthermore, the small percentage of respondents under stewardship agreements reflects situations in which land is managed on behalf of another owner, often with shared responsibilities and obligations. This typically involves caretaking or supervising the land and carrying out agricultural activities in accordance with agreements with the owner, with responsibilities and profits shared as stipulated.

The distribution of tenurial status highlights the importance of land security in promoting effective farm management, sustainability, and the adoption of recommended agricultural practices among rice farmers in Central Luzon.

➢ *Farming Experience*

Table 6 presents the distribution of respondents by years of farming experience. The data showed that most respondents have substantial experience in rice farming, with 25.49% having 21–30 years, 25.49% having 31–40 years, and 16.67% having 41 years and above. Farmers with 11–20 years of farming experience accounted for 19.61%, and only 12.75% have 10 years or less of farming experience. The mean farming experience of the respondents is 29.28 years, indicating that the majority have long-term exposure and familiarity with agricultural practices.

Table 6 Farming Experience of the Respondents

Years of Farming experience	Frequency	Percentage (%)
10 years and below	13	12.75
11-20	20	19.61
21-30	26	25.49
31-40	26	25.49
41 years and above	17	16.67
Total	102	

Extensive farming experience is often associated with increased knowledge, skill development, and better decision-making in farm management (FAO, 2011; World Bank, 2014). Experienced farmers are more likely to adopt improved techniques, implement Good Agricultural Practices (GAP), and effectively respond to challenges such as pest management, climate variability, and resource optimization. On the other hand, less experienced farmers may face constraints in technical know-how and farm productivity due to limited exposure to agricultural innovations (Philippine Statistics Authority, 2018).

➢ *Membership in Organization*

Table 7 presents the respondents' organizational membership. Most respondents are members of organizations, with 93.14% reporting membership, while only 6.86% being non-members. This reflects a high level of participation in organized groups among the rice farmers.

Table 7 Membership in an Organization and Types of Organizations of the Respondents

Particular	Frequency	Percentage (%)
Membership in an organization		
Member	95	93.14
Non- Member	7	6.86
Total	102	
Type of organization		

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Agricultural cooperative	41	43.16
Multi-Purpose Cooperative	15	15.79
Farmers/Growers Association	35	36.84
Producer Cooperative	4	
Total	102	

Regarding the type of organization, most members reported belonging to agricultural cooperatives (43.16%), followed by farmers' associations (36.84%), multi-purpose cooperatives (15.79%), and the least percentage in producer cooperatives (4.21%). These findings showed that most respondents were actively engaged in collective organizations, particularly cooperatives and farmer associations.

➢ *Description of Institutional Factors*

- *Farm Size*

The farm size of respondents was assessed to understand the scale of agricultural operations and their potential influence on productivity, adoption of Good Agricultural Practices (GAP), and farm management strategies.

Table 8 Farm Size in Hectares of the Respondents

Particular	**Frequency**	**Percentage (%)**
Farm Size (ha)		
Less than 1 ha	23	22.55
1.00-2.00	52	50.98
2.01-3.00	15	14.71
3.01-4.00	6	5.88
4.01 and above	6	5.88
Total	102	

As shown in Table 8, the majority of the respondents (50.98%) managed a farm size of 1.00 to 2.00 hectares, while 22.55% of the farmer-respondents managed less than one (1) hectare. Farmer respondents with farm sizes of 2.01–3.00 hectares account for 14.71%, and both 3.01–4.00 hectares and 4.01 hectares or more registered 5.88%. The mean farm size of 1.81 hectares confirms that the respondents generally manage relatively small farms.

Small farm sizes are characteristic of rice farming in many regions of the Philippines and often imply limited access to mechanization, capital, and other resources, which can affect productivity and the ability to adopt improved agricultural technologies (Philippine Statistics Authority, 2018; FAO, 2011). Smallholder farmers, however, are often highly knowledgeable about their land and local agricultural conditions, which can contribute to efficient resource management and sustainable practices (World Bank, 2014). Conversely, larger farm operations may have greater capacity to invest in modern technologies and GAP implementation, but they are less common among the surveyed respondents.

The predominance of small- to medium-sized farms underscores the need for targeted extension programs, technical support, and capacity-building initiatives tailored to farmers' scale and resource constraints. Programs promoting productivity enhancement, sustainable practices, and market linkages should consider farm size as a critical factor in ensuring equitable and effective implementation.

- *Distance of the Respondents' Farms to Market*

Table 9 shows that the majority of respondents (43.14%) cultivated farms located 6.01 kilometers or more from the nearest market, while respondents located within 3.01 to 6.00 kilometers account for 29.41%. Only 27.45% were situated 1.00 to 3.00 kilometers from the market. The mean distance of 5.80 kilometers suggests that, on average, the respondents' farms are moderately distant from market centers. The proximity of farms to market centers plays a crucial role in farmers' access to inputs, the sale of produce, and overall farm profitability.

Farms farther from markets often face challenges such as increased transportation costs, reduced access to farm inputs, and difficulties in selling perishable goods in a timely manner (FAO, 2011; World Bank, 2014). Such constraints can affect farm profitability, limit participation in market-oriented production, and reduce farmers' capacity to adopt new technologies or expand their operations.

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Table 9 Distance of the Farm of the Respondents to the Nearest Market

Particular	Frequency	Percentage (%)
Distance to nearest market (km)		
1.00-3.00	23	22.55
3.01-6.00	52	50.98
6.01 and above	15	14.71
Total	102	

Conversely, farms closer to markets benefit from easier access to agricultural inputs, more competitive pricing for their produce, and opportunities to engage in value-added activities, which can enhance livelihood and economic resilience (Philippine Statistics Authority, 2018).

The observed moderate-to-long distances of most respondents' farms underscore the need for extension programs and interventions that address logistical challenges, improve market access, and provide solutions for post-harvest management. Strategies such as cooperative marketing, mobile trading centers, and transport support can help mitigate the disadvantages posed by remoteness, ensuring that both smallholder and medium-scale farmers can fully benefit from sustainable farming practices and income-generating opportunities.

➢ *Description of Bio-physical Factors of the Respondents' Farm*

- *Access to Irrigation*

Irrigation is a critical biophysical factor that directly influences crop productivity, cropping intensity, and the successful implementation of Good Agricultural Practices (GAP). As shown in Table 10, all respondents (100%) reported having access to irrigation, indicating that water availability is not a limiting constraint in their farming operations. This universal access to irrigation provides favorable conditions for stable rice production and supports the adoption of improved agricultural practices.

- *Source of Irrigation*

In terms of irrigation sources, the majority of respondents (64.71%) relied on pump irrigation systems, followed by rainfed systems (16.67%) and communal irrigation (14.71%). A small proportion of farmers relied on the National Irrigation Administration (NIA) system (2.94%) and other sources (0.98%), leading to a high level of individual investment in water access and greater farm-level control over irrigation scheduling.

The predominance of pump irrigation indicated flexibility and autonomy among farmers in managing water supply; however, it may also imply higher production costs due to fuel or electricity use (FAO, 2011). In contrast, reliance on rainfed agriculture exposes farmers to climatic variability and may increase vulnerability to drought and irregular rainfall patterns (World Bank, 2014).

Table 10 Source of Irrigation

Profile	Frequency	Percentage (%)
Availability of irrigation		
Yes	102	100.00
None	0	0
Total	102	
Source of irrigation		
Rainfed	17	16.67
Communal Irrigation	15	14.71
Pump	66	64.71
NIA System	3	2.94
Others	1	0.98
Total	102	

Communal and NIA-managed irrigation systems, although less utilized in this study, are generally associated with more structured water distribution but may involve limitations in scheduling, maintenance, and equitable access (Philippine Statistics Authority, 2018).

The findings showed that while irrigation access is widespread among respondents, the type of irrigation system used had important implications for cost efficiency, sustainability, and resilience to climate variability. These factors may be considered when designing extension programs and interventions to improve water-use efficiency, reduce production costs, and promote sustainable irrigation management practices among farmers.

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- *Soil Nutrient Status*

Table 11 shows the distribution of soil nutrient levels for nitrogen (N), phosphorus (P), and potassium (K), which are essential macronutrients influencing crop growth, yield, and overall soil fertility. The data were based on the results of soil analysis for each respondent, as one of the requirements for the GAP certification. This soil test was conducted by the Regional Soils Laboratory (RSL) of the Department of Agriculture - Regional Field Office 3.

Table 11 Soil Nutrient Levels in Terms of NPK

Level	Nutrient			Percentage (%)		
	N	P	K	N	P	K
High	6	5	7	5.88	4.90	6.86
Moderate	72	76	76	70.59	74.51	74.51
Low	16	18	15	15.69	17.65	14.71
Very Low	8	3	4	7.84	2.94	3.92
Total	102	102	102	100	100	100

For nitrogen, the majority of farms fall within the moderate category (72) (70.59%), indicating that most soils have adequate nitrogen levels to support crop growth. However, a notable number of farms are classified as low (16) (15.69%) and very low (8) (7.84%), suggesting that nitrogen deficiency remains a concern in certain areas. Only a small proportion of farms exhibit high nitrogen levels (6) (5.88%). Nitrogen is a critical nutrient for plant vegetative growth, and its deficiency can significantly reduce crop yield and productivity (FAO, 2011).

Similarly, for phosphorus, most soil samples were categorized as moderate (76) (74.51%), indicating generally sufficient phosphorus availability for plant development. However, 18 (17.65%) samples fall into the low category, while only 3 (2.94%) were classified as very low and 5 (4.90%) as high. Phosphorus plays a vital role in root development, energy transfer, and early plant establishment; thus, inadequate levels may limit crop performance and reduce yield potential (Brady & Weil, 2017).

For potassium, the pattern remains consistent, with the majority of samples in the moderate category (76) (74.51%), suggesting adequate potassium levels. Meanwhile, 15 (14.71%) samples were classified as low, 4 (3.92%) as very low, and 7 (6.86) as high. Potassium is essential for plant water regulation, disease resistance, and overall crop quality, and deficiencies may affect plant vigor and resilience to environmental stress (Marschner, 2012).

The findings indicated that although most farms have moderate levels of essential nutrients, some areas still have nutrient deficiencies that may require targeted soil management interventions. The presence of low and very low nutrient levels highlights the need for proper soil testing, balanced fertilization, and nutrient management strategies to optimize crop productivity and ensure sustainable farming practices. These results underscore the importance of site-specific nutrient management to improve soil fertility and support the effective implementation of Good Agricultural Practices (GAP).

- *Description of Economic Factors*

Table 12 presents the economic profile of the respondents regarding farm production costs, yields, and income before and after adopting improved practices. Results revealed that production cost increased from Php 41,240.00 per hectare to Php 46,411.00 per hectare. This upward trend suggests rising input and operational expenses, which may be attributed to higher prices for labor, fertilizers, pesticides, and other farm inputs. Rising production costs are a common challenge in agriculture and can significantly affect farmers' profitability and sustainability (FAO, 2011).

Table 12 Economic Profile of the Respondents

Particular	Before	Current
Production Cost (Php/ha)	41,240.00	46,411.00
Yield (bags/ha)	101.00	99.88
Farm Income (Php/ha)	36,702	37,003

In terms of yield, a slight decrease was observed from 101.00 bags/ha to 99.88 bags/ha. Although the decline is minimal, it indicates that the increased production costs did not translate into improved productivity. This may be due to inefficiencies in input use, environmental factors, or limitations in farm management practices. Previous studies suggest that productivity gains do not always follow the adoption of improved practices, particularly when external factors such as climate variability and soil conditions are present (World Bank, 2014).

Despite increases in production costs and a slight decline in yield, farm income increased marginally from Php 36,702.00 per hectare to Php 37,003.00 per hectare. This improvement may be attributed to better market prices, improved product quality, or enhanced marketing strategies associated with the adoption of Good Agricultural Practices (GAP). GAP adoption has been linked to improved market access and price premiums, driven by better quality and compliance with safety standards (Briones, 2017).

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The findings showed that while farmers are experiencing higher production costs, the slight income improvement suggests potential economic benefits from GAP adoption. However, the absence of appropriate interventions to address yield improvement signals the need for more efficient input utilization, cost management strategies, and continuous technical support to enhance productivity and profitability.

➢ *Levels of Awareness of Adopters on Good Agricultural Practices in Terms of its Principles, Benefits, and Requirements*

- *GAP Principles*

Table 13 presents the respondents' level of knowledge regarding the core principles of Good Agricultural Practices (GAP). The results revealed a consistently very high level of knowledge across all indicators, with an overall mean score of 4.32 (SD = 0.61). This indicates that respondents possessed a strong, well-established understanding of GAP principles, which is essential for the effective implementation of sustainable and safe agricultural practices.

Table 13 Level of Knowledge on GAP Principles

Particular	Mean	SD	Descriptive Rating
GAP promotes safe and sustainable production.	4.30	0.63	Very high level of knowledge
GAP includes worker safety and hygiene.	4.32	0.60	Very high level of knowledge
GAP emphasizes record-keeping and monitoring of farm activities.	4.33	0.60	Very high level of knowledge
GAP promotes safe and sustainable production.	4.32	0.61	Very high level of knowledge
Overall mean	**4.30**	**0.63**	**Very high level of knowledge**

Legend: 1.00-1.79 No Knowledge, 1.80-2.59 Little Knowledge, 2.60-3.39 Moderate Level of Knowledge, 3.40-4.19 High Level of Knowledge, 4.20-5.00 Very High of Knowledge

Among the indicators, "GAP emphasizes record-keeping and monitoring of farm activities" obtained the highest mean score (4.33). This finding indicates that respondents are highly aware of the importance of documentation in farm management. Record-keeping is a fundamental component of GAP, as it ensures traceability, supports decision-making, and facilitates compliance with food safety and quality standards (FAO, 2011), which supports the study's findings. The high level of knowledge in this area is an indicator that farmers recognized the role of systematic monitoring in improving farm efficiency and accountability.

According to the majority of the farmer respondents, "GAP promotes safe and sustainable production," which obtained the lowest mean (4.30), although it still falls within the "very high level of knowledge" category. This means that while respondents were highly aware of sustainability concepts, there were slight variations on how these principles were understood or applied in practice. Sustainable production encompasses environmental protection, efficient resource use, and long-term farm viability, all of which are critical to ensuring resilience in agricultural systems (World Bank, 2014).

Similarly, the knowledge level on "GAP includes worker safety and hygiene" (mean = 4.32) reflects strong awareness of labor welfare, occupational safety, and health standards. This is particularly important in agricultural settings, where exposure to chemicals and physical hazards is common. Ensuring worker safety is a key pillar of GAP and contributes to both productivity and social sustainability (ILO, 2015).

Overall, the uniformly high ratings across all indicators indicate that extension programs, training, and institutional support have been effective in disseminating knowledge about GAP principles. However, high levels of knowledge do not necessarily guarantee full adoption or correct implementation. Therefore, continuous capacity-building efforts, technical assistance, and monitoring are necessary to translate knowledge into consistent practice and improved farm outcomes.

- *GAP Benefits*

Table 14 provides a detailed overview of the respondents' knowledge regarding the benefits of Good Agricultural Practices (GAP).

Table 14 Level of knowledge on GAP Benefits

Particular	Mean	SD	Descriptive Rating
GAP increases market access (local, premium, and export).	4.24	0.69	Very high level of knowledge
GAP improves product quality and safety.	4.31	0.63	Very high level of knowledge
GAP reduces negative environmental impacts.	4.33	0.62	Very high level of knowledge
Overall mean	**4.29**	**0.65**	**Very high level of knowledge**

Legend: 1.00-1.79 No Knowledge, 1.80-2.59 Little Knowledge, 2.60-3.39 Moderate Level of Knowledge, 3.40-4.19 High Level of Knowledge, 4.20-5.00 Very High of Knowledge

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The overall mean score of 4.29 (SD = 0.65) indicates that respondents had a very high level of knowledge in their farms.

Among the specific benefits, the highest mean score of 4.33 was recorded on "GAP reduces negative environmental impacts," indicating that the respondents were aware of the ecological advantages of GAP. This finding reflected a strong understanding of sustainable agricultural practices, including soil conservation, efficient use of water and nutrients, reduction in chemical residues, and protection of local ecosystems. Awareness of these environmental benefits is crucial because sustainable farm management practices contribute not only to long-term soil fertility and productivity but also to mitigating climate-related risks (FAO, 2011; Pretty et al., 2018).

The lowest mean score of 4.24 corresponds to "GAP increases market access (local, premium, and export)," which, while still very high, suggests that respondents have comparatively less awareness of the economic and market-oriented advantages of GAP. This highlights a potential area for further capacity-building, as knowledge of market opportunities is critical for enhancing farm profitability. Certification and compliance with GAP standards can improve access to premium and export markets by assuring buyers of product safety, quality, and traceability, thereby offering farmers economic incentives for sustainable practices (World Bank, 2014; FAO, 2011).

For the intermediate benefit, "GAP improves product quality and safety," a mean of 4.31 was recorded, indicating that respondents were well informed about GAP's role in producing safe, high-quality crops. Knowledge in this area is vital for reducing post-harvest losses, ensuring consumer health, and maintaining consistent product standards, thereby enhancing competitiveness in both local and broader markets (FAO, 2011).

These findings show that respondents recognized GAP as a multidimensional framework that balances environmental sustainability, economic potential, and product quality. While environmental awareness appears most pronounced, the slightly lower score in market access implies that further educational interventions could enhance farmers' understanding of GAP as a tool for economic empowerment and market integration. Promoting this knowledge can strengthen adoption rates and encourage the consistent application of GAP, ultimately supporting sustainable agricultural development.

- *GAP Requirements*

In Table 15, the respondents' knowledge regarding the requirements of Good Agricultural Practices (GAP) can be gleaned. The overall mean score of 4.31 (SD = 0.63) indicates a very high level of understanding among respondents, suggesting that farmers were well-informed about the essential practices required for GAP compliance.

Table 15 Respondents' Knowledge of the GAP Requirements

Particular	Mean	SD	Descriptive Rating
GAP requires proper handling and storage of pesticides.	4.30	0.64	Very high level of knowledge
GAP requires farm sanitation and proper waste management.	4.31	0.65	Very high level of knowledge
GAP requires regular record-keeping of farm activities.	4.30	0.64	Very high level of knowledge
Overall mean	**4.31**	**0.63**	**Very high level of knowledge**

Legend: 1.00-1.79 No Knowledge, 1.80-2.59 Little Knowledge, 2.60-3.39 Moderate Level of Knowledge, 3.40-4.19 High Level of Knowledge, 4.20-5.00 Very High Level of Knowledge

Among the specific requirements, the highest mean of 4.31 was reported for "GAP requires farm sanitation and proper waste management," indicating that respondents were particularly knowledgeable about maintaining cleanliness and managing farm residues effectively. Proper farm sanitation and waste management are critical components of sustainable agriculture, as they reduce the risk of pest infestations, disease outbreaks, and environmental contamination, ultimately supporting both crop productivity and ecological integrity (FAO, 2011; Pretty et al., 2018).

The lowest mean, 4.30, was shared by "GAP requires proper handling and storage of pesticides" and "GAP requires regular record-keeping of farm activities," although both still fall within the very high level of knowledge. Awareness of safe pesticide handling is vital to protect farmers' health, prevent chemical residues in crops, and minimize environmental hazards (World Health Organization, 2019). Meanwhile, knowledge of systematic record-keeping reflects an understanding of traceability, accountability, and informed decision-making—key principles in GAP that enable effective monitoring of farm operations and compliance with certification standards (FAO, 2011).

The findings indicate that respondents possessed a comprehensive understanding of GAP requirements, particularly in areas related to farm sanitation, chemical safety, and proper documentation. This high level of awareness indicated that farmers were

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equipped to implement GAP effectively, which can enhance farm productivity, ensure food safety, reduce environmental risks, and improve access to premium markets that require certified agricultural products (World Bank, 2014).

- *Training Exposure of Adopters on Good Agricultural Practices in Terms of Frequency, Type of Training and Relevance of Training*

- *Training Exposure of Adopters on Good Agricultural Practices*

Table 16 presents respondents' training exposure regarding awareness, sources of information, and participation in GAP-related training. The results show that all respondents (100%) reported awareness of GAP, indicating that knowledge about Good Agricultural Practices has been widely disseminated among farmers in the study area. This high level of awareness suggests that extension initiatives and formal information campaigns have successfully reached the target population.

In terms of sources of information, the majority of respondents identified government agencies as their primary sources, with the Department of Agriculture (DA) at 81.37% and the Municipal Agriculture Office (MAO) at 9.80%, highlighting the pivotal role of public institutions in promoting GAP adoption. Secondary sources, such as training/seminars (3.92%), cooperatives (3.92%), and fellow farmers (0.98%), were less utilized, indicating that formal, institutional channels remain the dominant mode of GAP knowledge transfer. This aligns with studies showing that government-led programs are critical in disseminating agricultural innovations in rural settings, particularly among smallholder farmers (FAO, 2011; Knowler & Bradshaw, 2007).

Table 16 Training Exposure Among GAP Adopters

Particular	Frequency	Percentage (%)
Awareness of GAP		
Yes	102	100
No	0	0
Total	**102**	
Source of information		
DA	83	81.37
MAO	10	9.80
Training/Seminar	4	3.92
Cooperative	4	3.92
Fellow farmers	1	0.98
Total	**102**	
Attended training		
Yes	97	95.10
No	5	4.90
Total	**102**	
Conducted the training		
Government agency	96	98.97
Private company	1	1.03
Total	**102**	

With regards to training participation, a substantial majority of respondents (95.10%) have attended GAP-related training, with almost all of these sessions facilitated by government agencies (98.97%). Only a small proportion (1.03%) received training from private companies. This demonstrates strong institutional support for capacity-building, which is essential in enhancing technical competence and facilitating the adoption of GAP. Research indicates that repeated exposure to structured training positively influences farmers' knowledge, skills, and the practical implementation of sustainable agricultural practices (Shiferaw et al., 2015).

Table 17 Respondents' Access to the GAP Manual or Guidelines

Particular	Frequency	Percentage (%)
Access of GAP Manual or Guidelines		
Yes	74	72.55%
No	28	27.45%
Total	**102**	

As to the distribution of GAP manuals or guidelines, the data (Table 17) showed that 74 (72.55%) of the respondents possessed a copy, while 28 (27.45%) did not. While the majority have access to written reference materials, the remaining gap suggests a need for universal access and effective use of such resources to reinforce training outcomes and ensure consistent practice adoption. Written guidelines can serve as a continuous reference for farm-level decision-making and adherence to GAP standards, especially in complex operations such as record-keeping, pest management, and irrigation scheduling (FAO, 2016).

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Based on the data gathered, farmers' exposure to GAP training is high, largely due to government-led programs, and awareness is widespread. However, ensuring universal access to manuals and complementary learning materials can further enhance knowledge retention, skills application, and overall adoption of GAP among rice farmers. This emphasizes the importance of integrated capacity-building strategies that combine formal training, reference materials, and follow-up support to sustain adoption rates.

- *Knowledge of GAP from Training*

In Table 18, respondents' evaluation of the GAP training they attended, focusing on its relevance, applicability, and supplementary value, was presented. The results showed that all items received very high ratings, corresponding to the "Strongly Agree" category.

Table 18 Respondents' Level of Knowledge on GAP Training Attended

Particular	Mean	SD	Descriptive Rating
The training I attended is appropriate to my needs.	4.58	0.66	Strongly Agree
I often apply what I have learned from the training.	4.58	0.65	Strongly Agree
I have also attended other useful trainings (e.g., postharvest, marketing, etc.).	4.59	0.65	Strongly Agree
Overall Mean	**4.58**	**0.65**	**Strongly Agree**

The highest mean score of 4.59 (SD = 0.66) was recorded for "I have also attended other useful trainings (e.g., postharvest, marketing, etc.)," suggesting that respondents highly value supplementary training that broadens their skills in overall farm management and postharvest operations. The lowest mean of 4.58 (SD =0.65–0.66) was shared by both "The training I attended is appropriate to my needs" and "I often apply what I have learned from the training," reflecting that farmers perceive the training as relevant, practical, and directly applicable to their day-to-day farming activities.

The overall mean of 4.58 (SD = 0.65) confirmed that the GAP training programs are highly effective in addressing farmers' knowledge gaps and skill requirements. This suggests that the training goes beyond theoretical instruction, fostering practical application of GAP principles on the farm, which is critical for sustained adoption (Knowler & Bradshaw, 2007; FAO, 2011).

Moreover, these results are consistent with previous studies that emphasized the importance of well-structured, participatory, and needs-based agricultural training programs in enhancing knowledge retention and practical application among farmers (Davis et al., 2012). The inclusion of complementary topics such as postharvest handling, marketing, and farm record-keeping further enhances the training's relevance, contributing to improved farm productivity, market competitiveness, and the long-term sustainability of GAP adoption.

These findings underlined that training exposure, when tailored to farmers' needs and reinforced with practical applications, is a key driver of effective GAP implementation. Continuous capacity-building initiatives and refresher courses are recommended to maintain high knowledge levels and encourage consistent application of GAP standards.

➢ *Status of Certification Among Adopters of Good Agricultural Practices in Terms of Accessibility, Cost, and Sustainability of Compliance*

- *GAP Certification*

Table 19 presents respondents' perceptions of the GAP certification process regarding accessibility, cost, and institutional support.

Table 19 GAP Certification

Particular	Mean	SD	Descriptive Rating
The process of GAP certification in our area is easy.	4.13	0.79	Agree
The cost of certification is affordable.	4.14	0.81	Agree
My farm can maintain the required compliance standards.	4.24	0.82	Strongly Agree
There is sufficient support from the government or agencies during the certification process.	4.03	0.92	Agree
Overall mean	**4.13**	**0.84**	**Agree**

Legend: 1.00-1.79 Strongly Disagree, 1.80-2.59 Disagree, 2.60-3.39 Neither, 3.40-4.19 Agree, 4.20-5.00 Strongly Agree

Results showed a generally positive perception, with all items falling under the "Agree" category and an overall mean of 4.13 (SD = 0.84). Respondents expressed the highest confidence in their ability to maintain required compliance standards (mean = 4.24), reflecting their capability to adhere to GAP protocols and sustain quality-oriented farming practices.

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Conversely, the lowest mean (4.03) was associated with perceived sufficiency of government or agency support during certification, suggesting that although farmers feel confident in their compliance abilities, they perceive a need for more structured guidance and technical assistance during the certification process.

The affordability of certification received a mean of 4.14, indicating that respondents generally perceived the costs as manageable. This aligns with previous studies suggesting that perceived cost and accessibility are critical determinants of farmers' willingness to pursue certification (Pellegrini et al., 2018; FAO, 2011).

The positive overall perception demonstrates that GAP certification is viewed as attainable and sustainable, particularly when coupled with farmers' prior training, technical knowledge, and institutional support.

- *GAP Implementation*

Table 20 illustrates the extent to which respondents actively implemented GAP practices. The overall mean of 4.62 (SD = 0.61) indicates that farmers consistently "Always" apply GAP standards in their operations. The highest adherence was observed in practices related to personal protective equipment (PPE) use and record-keeping of farm inputs and activities (mean = 4.68), highlighting the emphasis on safety, documentation, and traceability, which are essential for both compliance and certification maintenance.

A slightly lower level of implementation was observed for soil and water testing before planting (mean = 4.47), suggesting that while environmental monitoring is recognized as important, logistical or resource limitations may slightly constrain its consistent application. Overall, the findings show that respondents effectively translate their knowledge and training into farm-level practices, demonstrating high commitment to safe, sustainable, and quality-oriented agriculture.

Table 20 GAP Implementation of the Respondents

Particular	Mean	SD	Descriptive Rating
I conduct soil and water testing before planting.	4.47	0.79	Always
I apply fertilizers based on soil test recommendations.	4.54	0.69	Always
I implement integrated pest management (IPM).	4.59	0.67	Always
I use personal protective equipment when applying pesticides	4.68	0.51	Always
I practice proper waste disposal and maintain farm sanitation.	4.67	0.51	Always
I keep records of inputs, farm activities, and yields	4.47	0.79	Always
I follow proper postharvest handling practices to maintain product quality.	4.54	0.69	Always
I participate in farm inspections related to GAP	4.59	0.67	Always
I accept and implement new farming recommendations.	4.68	0.51	Always
I continuously evaluate and improve my farm practices.	4.67	0.51	Always
Overall Mean	4.47	0.79	**Always**

Legend: 1.00-1.79 Not at all, 1.80-2.59 Rarely, 2.60-3.39 Sometimes, 3.40-4.19 Often, 4.20-5.00 Always

The strong adherence to GAP principles can be attributed to several interrelated factors: prior exposure to targeted GAP training (FAO, 2011), availability of technical guidance, and the perceived benefits of GAP, including environmental sustainability, product quality, and market access (Pellegrini et al., 2018; Knowler & Bradshaw, 2007). These results reinforce the notion that certification is not only a formal requirement but also a practical framework for improving farm management, safety, and market competitiveness.

In conclusion, the data claim that GAP certification among adopters was accessible, relatively affordable, and sustainable, with farmers demonstrating high compliance and consistent implementation of GAP practices. However, improvements in government or agency support during certification could further enhance the adoption process and ensure that all farms maintain high standards over time.

➢ *Levels of Awareness, Training Exposure, and Certification that Influence the Overall Adoption and Practice of Good Agricultural Practices*

- *Correlation Analysis*

Table 21 shows the relationships among GAP awareness, training exposure, certification, and GAP adoption. The results indicate that GAP awareness is not linked to GAP adoption ($r = 0.126$, $p = 0.206$). This suggests that it does not significantly affect farmers' decisions to adopt GAP. In contrast, training exposure showed a moderate positive correlation ($r = 0.251$) and is statistically significant ($p = 0.011$). This indicates that training plays an important role in increasing GAP adoption among farmers. Greater participation in training activities is associated with a higher likelihood of adopting GAP.

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Table 21 Correlation of Awareness, Training Exposure, and Certification Influences GAP Adoption

Particular	Correlation Coefficients	P-Value
GAP Awareness	0.126	0.206
Training Exposure	0.251	0.011
GAP Certification	0.142	0.155

** Significant at a 5% Level of Significance*

Meanwhile, GAP certification showed a weak positive correlation (r = 0.142) but is not statistically significant (p = 0.155). This concludes that certification alone does not significantly influence adoption, possibly due to barriers such as cost, complexity, or limited access to certification processes.

Overall, among the variables considered, training exposure was the only factor that significantly influenced GAP adoption, highlighting the importance of capacity-building programs in promoting sustainable agricultural practices.

➢ *Levels of Awareness, Training Exposure, and Certification that Influence GAP Adoption*

The correlation analysis in Table 21 provides insight into the relative influence of awareness, training exposure, and certification on the overall adoption and practice of Good Agricultural Practices (GAP).

- *GAP Awareness*

The analysis indicated a weak and non-significant correlation between GAP awareness and adoption (r = 0.126, p = 0.206). This shows that simply knowing about GAP principles, benefits, and requirements may not be sufficient to drive adoption. Farmers may be aware of GAP, but other factors—such as practical skills, access to resources, or perceived costs—may determine whether they implement these practices on their farms. This aligns with findings by Knowler and Bradshaw (2007), who noted that awareness alone often does not translate into behavioral change without complementary interventions such as hands-on training, technical support, and enabling resources.

- *Training Exposure*

In contrast, training exposure demonstrates a moderate, positive, and statistically significant correlation with GAP adoption (r = 0.251, p = 0.011). This highlights the critical role of capacity-building programs in fostering the practical implementation of GAP. Training equips farmers not only with theoretical knowledge but also with the practical skills necessary to implement GAP effectively, including safe pesticide application, integrated pest management, soil fertility management, and record-keeping (FAO, 2011). The positive association suggests that farmers who frequently attend training programs are more confident, competent, and likely to adopt GAP, supporting the view that hands-on, participatory training is essential for bridging the knowledge–practice gap in sustainable agriculture (Davis et al., 2012).

- *GAP Certification*

The correlation between GAP certification and adoption is weak and statistically non-significant (r = 0.142, p = 0.155). While certification is intended to formalize compliance with GAP standards, its limited impact on adoption may reflect practical barriers. These include the financial costs of certification, procedural complexity, limited technical support, or the perception that certification does not directly affect day-to-day farming practices. Similar observations have been reported in other studies, where formal certification alone did not guarantee adoption unless combined with adequate training and institutional support (González et al., 2015; World Bank, 2014).

The findings underscore that among the variables studied, training exposure is the most influential factor in promoting GAP adoption. This underscores the importance of well-structured, targeted, and frequent training programs, particularly those delivered by government agencies and agricultural institutions, in promoting sustainable farming practices. While awareness and certification are important, they function more as enabling conditions; actual adoption is driven by practical learning, skill development, and hands-on experience. Consequently, extension services should focus on increasing training frequency, diversifying topics (e.g., postharvest handling, marketing), and integrating practical exercises to maximize GAP adoption rates.

The findings suggest several implications for policymakers and agricultural agencies. First, training programs should be prioritized over awareness campaigns alone, as practical, hands-on training has a greater impact on farmers' adoption of Good Agricultural Practices (GAP). Second, certification processes should be simplified, subsidized, and supported with technical assistance to increase their accessibility and relevance, thereby enhancing their influence on adoption. Finally, awareness campaigns, while still valuable, need to be integrated with practical training and sustained institutional support to ensure that knowledge is effectively translated into farm-level practice. By addressing these areas, stakeholders can strengthen the adoption and sustainability of GAP among rice farmers.

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➢ *The Extent to Which the Socio-demographic, Institutional, Biophysical, and Economic Factors Influence the Over-all Adoption and Practice of GAP*

- *Multiple Regression Analysis*

The regression model indicated a moderate correlation (R = 0.564). The coefficient of determination (R^2 = 0.318) suggests that about 31.80% of the variation in the dependent variable is explained by the independent variable(s). In comparison, the remaining 68.20% is due to other factors not included in the model.

The results showed that sex significantly influences GAP implementation (β = 0.406, p = 0.004). The positive coefficient indicates that male farmers have significantly higher GAP implementation scores compared to female farmers. In other words, being male is linked to greater adoption and implementation of GAP, while being female is associated with lower GAP implementation, according to the study's findings. This highlights that gender differences play a crucial role in the adoption of Good Agricultural Practices in the study area.

Table 22 Model Coefficients for GAP Adoption

Predictor	Estimate	SE	t-value	p-value
Intercept[a]	4.49202	0.65174	6.8924	<.001
Age	-0.00108	0.00749	-0.1444	0.886
Farm Experience	-0.00287	0.00546	-0.5263	0.600
Household Member	-0.01022	0.03558	-0.2873	0.775
Land Area	-0.00652	0.04597	-0.1417	0.888
Distance	0.02489	0.02043	1.2182	0.227
Sex (Male–Female)	0.40555	0.13686	2.9632	0.004*
Civil Status (Widowed–Separated)	0.15801	0.40305	0.3920	0.696
Civil Status (Married–Separated)	0.00542	0.38685	0.0140	0.989
Civil Status (Single–Separated)	0.20832	0.49887	0.4176	0.677
Education (High School Graduate–Elementary Graduate)	-0.04161	0.18792	-0.2214	0.825
Education (College Level–Elementary Graduate)	0.13416	0.24753	0.5420	0.589
Education (College level–Elementary Graduate)	0.00385	0.21846	0.0176	0.986
Education (Vocational–Elementary Graduate)	-0.15262	0.23007	-0.6634	0.509
Land Tenure (Tenant–Owned)	-0.05961	0.12573	-0.4741	0.637
Land Tenure (Stewardship–Owned)	0.25778	0.59176	0.4356	0.664

Table 22 Model Coefficients for GAP Adoption (cont'd)

Predictor	Estimate	SE	t-value	p-value
Membership (No–Yes)	-0.14429	0.25034	-0.5764	0.566
Income	1.25E-06	2.19E-06	0.5701	0.570
Production	1.83E-06	2.19E-06	0.8327	0.408
Yield	0.00127	0.00125	1.0147	0.313
Nitrogen	-0.19886	0.15748	-1.2627	0.210
Phosphorus	0.00537	0.29517	0.0182	0.986
Potassium	0.07220	0.17921	0.4029	0.688

** Significant at a 5% Level of Significance*

- *Effects of Adoption on Production, Income, and Yield*

In Table 23, the results of the paired t-test comparing production cost, yield, and income before and after (or current) are presented. For the production cost, the computed t-value is 4.130 with a p-value of 0.000, indicating statistical significance at the 0.05 level. The mean difference of 5,171.61 indicates a significant increase in production costs. This suggests that farmers are spending more on inputs and farm operations over time. In contrast, for yield, the t-value was 0.403, and the p-value was 0.688, which is not statistically significant. The mean difference of -1.15 suggests a slight decrease in yield; however, this change is minimal and not statistically meaningful. Similarly, for income, the t-value is 0.181, and the p-value is 0.857, indicating no significant difference. Although there is a mean increase of 382.54, this change is not statistically significant.

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Table 23 Paired T-Test of Economic Profile

Particular	statistic	df	p-value	Mean difference
Production	4.130	101	0.000*	5171.61
Yield	-0.403	101	0.688	-1.15
Income	0.181	101	0.857	382.54

Significant at a 5% Level of Significance

Overall, the results reveal that only production costs show a significant change, while yield and income remain statistically unchanged. This implies that increased farm expenditures has not to corresponding improvements in productivity.

➢ *Barriers and Facilitating Factors in GAP Adoption*

- *Enablers and Barriers*

✓ *Enablers*

Table 24 presents the respondents' perceptions of factors that enable or hinder the adoption of Good Agricultural Practices (GAP). Respondents generally agree that certain factors encourage GAP adoption, with an overall mean of 3.85 (SD = 0.96). Government support (e.g., subsidies, programs) rated 3.91, reflecting that institutional assistance positively influences adoption. Adequate training and technical assistance – rated 4.13, indicating that access to guidance and capacity-building strongly supports implementation, and market or demand for GAP-certified products rated 3.52, suggesting that while market opportunities are recognized, they are perceived as less strong than government support or training.

Table 24 Enablers and Barriers in GAP Adoption

Particular	Mean	SD	Descriptive Rating
Government support (e.g., subsidies, programs) encourages the adoption of GAP.	3.91	0.85	Agree
There is a market or demand for products with GAP certification.	3.52	1.17	Agree
Adequate training and technical assistance are provided.	4.13	0.70	Agree
Overall Mean	**3.85**	**0.96**	**Agree**
Barriers			
The certification requirements are time-consuming and complex.	2.62	1.05	Neither
The cost of certification is high.	2.53	1.05	Disagree
There is insufficient capital to implement the required practices.	3.03	1.09	Neither
The market for GAP-certified products is limited.	3.33	1.34	Neither
Overall mean	**2.88**	**1.18**	**Neither**

Legend: 1.00-1.79 Strongly Disagree, 1.80-2.59 Disagree, 2.60-3.39 Neither, 3.40-4.19 Agree, 4.20-5.00 Strongly Agree

These results indicate that government programs, training, and market opportunities are key motivators for farmers to adopt GAP.

✓ *Barriers*

Table 24 also presents the barriers to GAP Adoption. Respondents perceive moderate challenges in adopting GAP, with an overall mean of 2.88 (SD = 1.18), interpreted as "Neither Agree nor Disagree". Time-consuming and complex certification requirements rated 2.62, indicating some concern about bureaucratic or procedural difficulties. The high cost of certification was rated 2.53 (Disagree), suggesting that respondents generally do not view cost as the primary barrier. Insufficient capital to implement required practices was rated 3.03, reflecting moderate concern about financial constraints. In contrast, the limited market for GAP-certified products, rated 3.33, indicates uncertainty about market opportunities for certified producers.

Overall, the findings indicate that while respondents recognize several enablers that facilitate GAP adoption, there are moderate barriers, particularly procedural complexity, capital availability, and market limitations. These insights can guide interventions to strengthen support mechanisms and reduce adoption challenges.

- *Challenges in Adopting GAP*

Based on the data gathered, farmers generally have a positive attitude toward adopting Good Agricultural Practices (GAP), despite encountering several constraints.

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The adoption and learning of GAP shows that, while the initial implementation was challenging, farmers gradually became familiar with GAP through training such as PRA. They attested that learning by doing and continuous exposure play an important role in successful adoption. Moreover, farmers recognized that sustaining these practices is essential to fully realizing the benefits of GAP.

Aligned with this, the positive perceptions of GAP indicated that farmers appreciate its role in improving farming practices, ensuring food safety, promoting environmental sustainability, and supporting labor rights. These findings state that awareness of GAP's benefits is not a major obstacle; instead, farmers already recognize its importance in modern agriculture.

However, the need for ongoing training underscores the persistence of knowledge gaps, especially among farmers who have not received sufficient training. This emphasizes the importance of regular capacity-building programs, refresher courses, and extension services to ensure proper and consistent implementation of GAP.

Despite these positive perceptions, several challenges prevented full adoption. The workload and compliance requirements showed that GAP is labor-intensive, requiring strict adherence to record-keeping, sanitation, and proper farm management procedures. This increased workload may discourage some farmers, especially those with limited labor resources.

Furthermore, infrastructure and facilities constraints showed a lack of storage facilities, equipment, and other farm infrastructure, which hampers farmers' ability to meet GAP standards. This challenge is worsened by financial constraints and the high cost of inputs, as farmers struggle with limited capital and costly inputs, which decrease their overall profitability.

Market-related issues also emerged as a major concern. Due to market and pricing issues and a lack of market linkages, farmers reported receiving low prices for GAP-certified products, limited market recognition, and a lack of dedicated outlets. This suggests that even with certification, farmers do not receive sufficient economic incentives, which could weaken their motivation to adopt or sustain GAP practices.

The technology adaptation indicates that although farmers initially struggled with new technologies, they gradually adapted, demonstrating resilience and a willingness to innovate when given proper support.

Further, government support and monitoring require stronger institutional backing, such as financial aid, regular oversight, and ongoing communication. Farmers depend heavily on government agencies to maintain GAP programs, underscoring the significance of active extension services.

Environmental factors also play a crucial role. The environmental and climate challenges showed that typhoons, climate change, and pest infestations continue to threaten farm productivity, making it harder to maintain GAP standards.

On the operational side, farm management practices, as well as safety and compliance, demonstrate that farmers understand and implement key GAP principles, such as record-keeping, soil analysis, proper fertilizer application, and safe chemical handling. These practices help create safer working environments and promote more sustainable farming systems.

Finally, social and community factors show that GAP adoption is not only an individual decision but is also shaped by neighboring farmers and community practices. Non-compliance among nearby farms can decrease the overall effectiveness of GAP, while social pressures and personal limitations may influence individual participation.

Table 25 Challenges in GAP Adoption

Challenges	Response
Adoption & Learning of GAP	Farmers emphasized the need to follow PRA training to pass GAP. Initial adoption was difficult, but they eventually became familiar. Sustaining practices is necessary for success. GAP is generally viewed as beneficial, especially for improving knowledge, food safety, and proper farm practices.
Positive Perceptions of GAP	GAP helps improve farming practices, ensures cleaner, safer food, promotes environmental sustainability, and supports labor welfare. Farmers appreciate the technologies and principles of GAP and recognize its importance in food production.
Need for Continuous Training & Knowledge	Farmers highlighted the need for continuous learning, regular updates, and proper training to ensure correct implementation. Lack of knowledge among co-farmers sometimes leads to improper practices.

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Table 25 Challenges in GAP Adoption (cont'd)

Challenges	Response
Workload & Compliance Requirements	GAP implementation is labor-intensive and requires effort in farm preparation, record-keeping, maintaining cleanliness, and following protocols such as proper chemical use and waste disposal.
Infrastructure & Facilities Constraints	The lack of infrastructure, such as storage facilities and farm equipment, makes GAP implementation and production more difficult.
Technology Adaptation	Farmers experienced challenges in adjusting to new GAP technologies but gradually adapted over time.
Market & Pricing Issues	One of the most common concerns is the low price of agricultural products, including GAP-certified produce. Farmers reported a lack of market recognition, the absence of dedicated markets, and the undervaluation of GAP products.
Lack of Market Linkages	Farmers expressed the need for stronger market linkages, assured buyers, and the establishment of GAP market centers or outlets.
High Cost of Inputs	Many farmers reported that fertilizers, pesticides, and other farm inputs are expensive, which reduces profitability.
Government Support & Monitoring	There is a need for stronger government support, including financial assistance, regular monitoring, follow-ups, and consistent communication with GAP adopters.
Environmental & Climate Challenges	Climate change, typhoons, and pest infestations (e.g., armyworms) significantly affect farm productivity and income.
Farm Management Practices	Farmers emphasized proper record-keeping, soil analysis, correct fertilizer application, spraying, and waste management as essential GAP practices.

Table 25 Challenges in GAP Adoption (cont'd)

Challenges	Response
Safety & Compliance	GAP promotes safety in chemical handling, protection of farmers, and proper disposal of waste materials.
Financial Constraints	Farmers face financial difficulties such as lack of capital, low income, and minimal returns from farming.
Social & Community Factors	Adoption is affected by other farmers; neighboring farms not following GAP may limit overall impact. Some farmers feel hesitant or face personal challenges in compliance.
Adoption & Learning of GAP	Farmers emphasized the need to follow PRA training to pass GAP. Initial adoption was difficult, but they eventually became familiar. Sustaining practices is necessary for success. GAP is generally viewed as beneficial, especially for improving knowledge, food safety, and proper farm practices.
Positive Perceptions of GAP	GAP helps improve farming practices, ensures cleaner, safer food, promotes environmental sustainability, and supports labor welfare. Farmers appreciate the technologies and principles of GAP and recognize its importance in food production.
Need for Continuous Training & Knowledge	Farmers highlighted the need for continuous learning, regular updates, and proper training to ensure correct implementation. Lack of knowledge among co-farmers sometimes leads to improper practices.
Workload & Compliance Requirements	GAP implementation is labor-intensive and requires effort in farm preparation, record-keeping, maintaining cleanliness, and following protocols such as proper chemical use and waste disposal.

Table 25 Challenges in GAP Adoption (cont'd)

Challenges	Response
Infrastructure & Facilities Constraints	The lack of infrastructure, such as storage facilities and farm equipment, makes GAP implementation and production more difficult.
Technology Adaptation	Farmers experienced challenges in adjusting to new GAP technologies but gradually adapted over time.
Market & Pricing Issues	One of the most common concerns is the low price of agricultural products, including GAP-certified produce. Farmers reported a lack of market recognition, the absence of dedicated markets, and the undervaluation of GAP products.
Lack of Market Linkages	Farmers expressed the need for stronger market linkages, assured buyers, and the establishment of GAP market centers or outlets.
High Cost of Inputs	Many farmers reported that fertilizers, pesticides, and other farm inputs are expensive, which reduces profitability.

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Government Support & Monitoring	There is a need for stronger government support, including financial assistance, regular monitoring, follow-ups, and consistent communication with GAP adopters.
Environmental & Climate Challenges	Climate change, typhoons, and pest infestations (e.g., armyworms) significantly affect farm productivity and income.
Farm Management Practices	Farmers emphasized proper record-keeping, soil analysis, correct fertilizer application, spraying, and waste management as essential GAP practices.
Safety & Compliance	GAP promotes safety in chemical handling, protection of farmers, and proper disposal of waste materials.

Table 25 Challenges in GAP Adoption (cont'd)

Challenges	Response
Financial Constraints	Farmers face financial difficulties such as lack of capital, low income, and minimal returns from farming.
Social & Community Factors	Adoption is affected by other farmers; neighboring farms not following GAP may limit overall impact. Some farmers feel hesitant or face personal challenges in compliance.

- *Support or Program Needed to Strengthen the Adoption of GAP*

The findings in Table 26 indicate that farmers require comprehensive and sustained support systems to successfully adopt and maintain Good Agricultural Practices (GAP). These needs span across market, financial, technical, and institutional factors.

Market linkages and marketing support emerged as the most critical concern among the farmer respondents. They emphasized the need for reliable buyers, improved marketing systems, and dedicated outlets for GAP-certified products. The lack of market recognition and fair pricing discourages farmers from maintaining GAP practices. This shows that certification alone is not enough without strong market integration and price incentives, highlighting the importance of developing structured value chains for GAP products.

Table 26 Support or Program Needed to Strengthen the Adoption of GAP

Particular	Response
1. Market Linkages and Marketing Support	Farmers strongly emphasized the need for reliable market linkages, better marketing systems, and dedicated outlets for GAP products. They suggested improving recognition of GAP products, creating special market lanes, and ensuring stable and fair pricing. Some also highlighted the need to maintain or increase the price of GAP-certified products.
2. Financial Assistance and Capital Support	Many farmers requested financial aid, such as cash assistance, low- or no-interest loans, and capital support, to sustain their farming operations. They emphasized the need for continuous financial backing to maintain GAP certification and production.
3. Subsidies for Farm Inputs	A common need is subsidies for essential inputs such as seeds, fertilizers, pesticides, and herbicides. Farmers also requested an increase in the quantity and availability of these inputs and a reduction in their costs.
4. Training and Capacity Building	Farmers highlighted the importance of continuous training, seminars, and skills development programs. They emphasized the need for updated knowledge, proper implementation of GAP practices, and wider dissemination of GAP principles to other farmers.
5. Technical Assistance and Monitoring	Respondents requested stronger technical support from agricultural extension workers, including regular field visits, monitoring, and guidance to ensure proper GAP implementation.
6. Infrastructure, Facilities, and Mechanization	Farmers expressed the need for farm machinery, irrigation systems (e.g., drip irrigation), storage facilities, and appropriate mechanization suited to their farming conditions.

Table 26 Support or Program Needed to Strengthen the Adoption of GAP (cont'd)

Particular	Response
7. Government Support and Program Improvement	There is a strong call for more consistent government support, including better-designed programs aligned with farmers' actual needs. Farmers also want to be consulted in decision-making and program planning.
8. GAP Certification Support	Some farmers requested assistance in maintaining GAP certification, including financial support and possibly free certification services.
9. Production Sustainability Support	Farmers expressed the need for comprehensive and continuous assistance (inputs, financial aid, training, and market access) to ensure sustained GAP production.
10. Price Regulation and Income Improvement	Farmers emphasized raising agricultural product prices (especially rice), stabilizing market prices, and improving overall farm income.

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11. Input Cost Reduction	Aside from subsidies, farmers also suggested lowering the cost of farm inputs, such as fertilizers and pesticides, to reduce production costs.
12. Food Safety and Quality Promotion	Farmers recognized the importance of maintaining GAP standards to ensure food safety, high-quality products, environmental protection, and workers' health and welfare.

Closely related to this were price regulation and income improvement, for which farmers expressed a need for stable, higher prices, especially for agricultural commodities such as rice. The findings indicate that boosting farmers' income is crucial to encourage ongoing compliance with GAP standards.

Financial concerns were also a significant constraint. Under financial assistance and capital support, farmers requested cash aid, low- or no-interest loans, and ongoing financial backing. Likewise, the subsidies for farm inputs and input cost reduction may reduce the burden of high input costs, such as fertilizers, pesticides, and seeds. Accordingly, farmers find it difficult to sustain GAP without financial support due to rising production costs.

The farmer respondents recognized the value of training and capacity building since they were learning and gained improved knowledge. The farmer respondents emphasized the value of regular conduct of trainings, seminars, and skills development programs to ensure proper and current implementation of GAP. Coupled with these training programs is the need for technical assistance and monitoring, with respondents urging the active involvement of extension workers through regular field visits, monitoring, and hands-on guidance.

In terms of physical resources, infrastructure, facilities, and mechanization,, the data show that farmers need farm equipment, irrigation systems, storage facilities, and suitable mechanization to meet GAP standards efficiently. The lack of these resources restricts productivity and compliance.

Institutional support also plays a vital role. With government support and program improvement, farmers would want consistent, well-designed programs tailored to their actual needs, along with their participation in decision-making. The importance of participatory and responsive governance in agricultural development is what is asked for.

Further, the GAP certification support needs assistance in maintaining certification status, including financial assistance and possibly free certification services. It can also be noted from the responses that the costs and process of certification could be barriers to ongoing compliance. The production sustainability support combined several concerns: farmers need assistance with inputs, financing, training, and market access to promote long-term GAP adoption.

Based on the data, it can be gleaned that farmers are aware of GAP's role in ensuring safe, high-quality food, environmental sustainability, and worker well-being. Added to this are the external support systems required to fully realize the advantages of GAP.

- *Recommended Interventions to Encourage GAP Uptake and Sustainable Impact*

Farmers' recommendations underscore a strong commitment to enhancing, sustaining, and expanding Good Agricultural Practices (GAP) to achieve long-term benefits for both producers and consumers. They emphasized the promotion and institutionalization of GAP, advocating nationwide adoption and integration into standard agricultural programs to foster community-wide compliance and peer learning. Respondents provided positive feedback on GAP's effectiveness, noting improvements in farm practices, yields, knowledge and food safety, and stressed that sustainability requires continuous implementation and support rather than one-time interventions.

Training and knowledge dissemination emerged as priorities, with calls for refresher courses, calibration activities, and broader access to GAP guidelines, underscoring the essential role of knowledge in overcoming challenges and ensuring consistent practice. Farmers highlighted the importance of government support, including financial aid, technical assistance, monitoring, and program backing, as critical for effective implementation and certification compliance.

Economic incentives were also emphasized, with recommendations to strengthen market linkages, improve pricing, and provide financial assistance, demonstrating that economic viability motivates sustained adherence to GAP standards. Furthermore, respondents advocated for organizational improvements, stronger local institutions, and policy support, including assistance in maintaining GAP certification and prioritizing local produce, highlighting the role of institutional and regulatory frameworks in facilitating adoption.

Finally, farmers stressed recognition, inclusion, and awareness, urging consultation in decision-making and emphasizing the social and environmental values of GAP, including environmental protection, worker safety, and food safety. Overall, these recommendations highlight that sustained GAP adoption requires a holistic approach combining training, technical guidance,

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government support, market incentives, and community engagement, ensuring both productivity and social responsibility in agriculture.

Table 27 Suggestions from the Respondents

Particular	Response
1. Promotion and Expansion of GAP	Farmers expressed the desire for more farmers to adopt GAP for the benefit of all. They suggested expanding the program nationwide, encouraging more participation, and making GAP a standard requirement in agricultural programs.
2. Positive Feedback on GAP	Many respondents shared that GAP is effective and beneficial. They noted improvements in farming practices, increased knowledge, better yields, and safer food production. Some expressed gratitude for the program and its implementation.
3. Continuous Implementation of the Program	Farmers emphasized that GAP programs should continue and be sustained over time to ensure long-term benefits.
4. Training and Information Dissemination	There is a need for more training, refresher courses, and wider dissemination of GAP knowledge to farmers. Some suggested calibration activities to encourage adoption and continuous learning.
5. Government Support and Assistance	Farmers requested continued and increased government support, including financial aid, assistance programs, and overall backing for GAP farmers.
6. Monitoring and Technical Guidance	Respondents highlighted the need for consistent monitoring, guidance, and follow-up by authorities to ensure proper GAP implementation and to avoid neglect.
7. Market Linkages and Pricing	Farmers emphasized the need for stronger market linkages, better marketing support, and higher prices for GAP products compared to non-GAP products. They also suggested expanding market opportunities.
8. Financial Assistance	Some farmers mentioned the need for financial aid to support their farming operations and to comply with GAP.

Table 27 Suggestion of the Respondents (cont'd)

Particular	Response
9. Organizational and Program Improvement	Suggestions included improving the management of farmer associations and ensuring the effective implementation of GAP-related activities and programs.
10. GAP Certification and Renewal Support	Farmers expressed concerns about GAP certification renewal and suggested helping in maintaining certification.
11. Policy Concerns (Importation)	Some farmers raised concerns that importation would affect local GAP farmers and suggested prioritizing local produce.
12. Recognition and Inclusion of Farmers	Farmers want to be acknowledged, consulted, and valued, especially in program planning and implementation.
13. Environmental & Health Benefits Awareness	Farmers highlighted that GAP ensures environmental protection, worker safety, and food safety, and encouraged others to adopt it for these benefits.

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CHAPTER FIVE
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents the summary of the results and conclusions derived from the findings, and specific recommendations of the researcher.

➢ *Summary*

This study aimed to assess the extent to which farmers' adoption of Good Agricultural Practices (GAP) influenced rural development in Central Luzon. Specifically, it sought to describe the socio-demographic characteristics, institutional factors, biophysical factors, and economic factors, determine the levels of awareness of GAP adopters in terms of the principles, benefits, and requirements, assess the training exposure of GAP adopters in terms of frequency, type, and relevance of training attended, describe the GAP adopters in terms of the extent of adoption and practice of GAP, determine the extent to which the socio-demographic, institutional, biophysical, and economic factors influence the overall adoption and practice of GAP, determine the extent to which the levels of awareness, training exposure, and certification influence the overall adoption and practice of GAP, identify the enabling factors and barriers affecting the adoption of GAP among rice farmer, identify the challenges and constraints encountered by farmers in adopting Good Agricultural Practices, and propose strategies or interventions that may improve and sustain the adoption of Good Agricultural Practices among rice farmers in Central Luzon.

The study assessed 102 GAP-Certified rice farmers by analyzing socio-demographic, institutional, economic, and bio-physical factors, as well as levels of awareness, training exposure, certification, and the challenges and supports affecting GAP adoption. The respondents were generally older (average age 57.56), mostly male (67.65%), married (78.43%), with an average household size of 3.83, and diverse educational backgrounds, primarily high school and college graduates.

Most rice farmers had extensive farming experience (mean = 29.28 years), owned their farms (63.73%), and actively participated in agricultural organizations, particularly cooperatives and farmer associations. Institutionally, they managed small to medium-sized farms (mean = 1.81 ha) situated at moderate distances from markets (mean = 5.8 km). Bio-physically, all had access to irrigation, primarily via personal pumps, and soil nutrient levels were generally moderate, indicating fertile conditions. Economically, production costs had significantly increased over time, while yield and income remained largely unchanged. Respondents demonstrated a very high level of knowledge regarding GAP principles (mean = 4.32), benefits (mean = 4.29), and requirements (mean = 4.31), with widespread exposure to training (95.10%) and access to GAP manuals or guidelines. Certification was generally perceived positively (mean = 4.13), though support during the process could improve, and GAP implementation was consistently high (overall mean = 4.62), particularly in safety, record-keeping, and sanitation. Training exposure significantly influenced GAP adoption ($r = 0.251$, $p = 0.011$), whereas awareness and certification alone did not.

Furthermore, regression analysis showed that male farmers scored higher in implementation. Adoption was supported by government aid, training, and market access, but challenges included labor-intensive compliance requirements, limited infrastructure, financial constraints, restricted market access, environmental issues, and complex certification processes.

To improve and sustain GAP adoption, farmers highlighted the importance of ongoing training, technical support, stronger government backing, financial assistance, better market connections, price stability, and sufficient farm infrastructure.

➢ *Conclusions*

Based on the findings of the study, the following conclusions were drawn:

- *Respondents' Socio-Demographic, Institutional, Biophysical, and Economic Profile***.**

The respondents were predominantly small- to medium-scale rice farmers with substantial farming experience, reflecting a mature and experienced agricultural workforce in Central Luzon. Most respondents were male, married, and had average household sizes that reflect typical rural family structures. Educational attainment ranged from elementary to college level, with a considerable proportion having completed secondary education, which suggests a relatively adequate literacy level for adopting agricultural innovations.

In terms of institutional characteristics, most farmers were affiliated with farmer organizations or cooperatives and received technical support from government agricultural institutions such as the Department of Agriculture and Municipal Agriculture Offices. Farm sizes were generally small to medium, averaging 1.81 hectares, and were located at moderate distances from local markets, which may influence input access and marketing opportunities.

Biophysically, all respondents had access to irrigation, primarily through pump systems and communal sources, ensuring water availability for rice production. Soil fertility levels for nitrogen, phosphorus, and potassium were generally moderate, indicating suitable but manageable soil conditions for crop production. Economically, farmers experienced increasing production costs over

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time due to rising input prices, while yields remained relatively stable, resulting in only modest improvements in income. This indicates that farmers are able to sustain production but face cost-related constraints in maximizing profitability.

- Level of Awareness on Good Agricultural Practices (GAP). The respondents exhibited a very high level of awareness regarding GAP principles, benefits, and requirements. This indicates that extension efforts and information dissemination activities have been effective in increasing farmers' understanding of sustainable and safe agricultural practices. Farmers demonstrated strong knowledge particularly in areas such as environmental protection, food safety, farm hygiene, record-keeping, and proper pesticide use. This high level of awareness suggests a strong foundation for behavioral change toward improved farming practices.
- Training Exposure of GAP Adopters. Training exposure among respondents was extensive, with most farmers having participated in GAP-related trainings conducted by government agencies and extension workers. These training programs were generally perceived as highly relevant, practical, and applicable to actual farming conditions. Farmers reported that trainings enhanced their technical skills and improved their confidence in implementing GAP practices. Moreover, respondents expressed a need for additional training in areas such as postharvest handling, value addition, and marketing, indicating that continuous capacity-building is necessary to strengthen the full value chain of GAP adoption.
- Extent of Adoption and Practice of GAP. The level of GAP adoption among respondents was consistently high, indicating strong implementation of recommended agricultural practices. Farmers regularly practiced key components of GAP such as the use of personal protective equipment, proper waste disposal, integrated pest management, and accurate farm record-keeping. Postharvest handling and sanitation practices were also widely observed. This demonstrates that farmers are not only aware of GAP but are effectively translating knowledge into consistent on-farm practices, contributing to improved farm management and sustainability.
- Influence of Socio-Demographic, Institutional, Biophysical, and Economic Factors on GAP Adoption. Among the different influencing factors, training exposure emerged as the most significant determinant of GAP adoption. While socio-demographic characteristics, institutional support, biophysical conditions, and economic factors provide important enabling environments, they do not directly ensure adoption unless reinforced by hands-on and continuous training. This indicates that capacity-building interventions play a central role in translating enabling conditions into actual practice.
- Influence of Awareness, Training Exposure, and Certification on GAP Adoption. The results revealed that training exposure significantly influences GAP adoption, while awareness and certification alone do not show significant independent effects. This implies that knowledge and certification, when not accompanied by practical application and experiential learning, are insufficient to ensure sustained behavioral change. Hands-on training and field-based learning are therefore critical in ensuring that farmers internalize and consistently apply GAP standards.
- Enabling Factors and Barriers Affecting GAP Adoption. Several enabling factors support GAP adoption, including high awareness levels, access to irrigation, moderate soil fertility, strong institutional support from government agencies, and availability of training programs. However, adoption is constrained by several barriers such as labor-intensive requirements, inadequate infrastructure, limited financial resources, and weak market incentives for GAP-compliant products. These constraints reduce the capacity of farmers to fully comply with GAP standards despite their willingness and knowledge.
- Challenges and Constraints in GAP Adoption. Farmers face multiple challenges in sustaining GAP adoption, including the complexity and cost of certification processes, limited technical assistance during compliance, high labor requirements, and inconsistent access to inputs and support services. These challenges create gaps between knowledge and full compliance, limiting the long-term sustainability of GAP implementation across all farming households.
- Proposed Strategies to Improve and Sustain GAP Adoption. To strengthen and sustain GAP adoption, a more integrated and holistic approach is required. This includes strengthening practical, field-based training programs; simplifying and subsidizing certification procedures; enhancing financial and technical support mechanisms; improving infrastructure such as irrigation and storage facilities; and strengthening market linkages with price incentives for GAP-certified products. Furthermore, sustained institutional collaboration among government agencies, local government units, and farmer organizations is essential to ensure continuous support, monitoring, and scaling of GAP practices.

➢ *Recommendations*

Based on the findings and conclusions of the study, the following interventions are recommended to enhance the adoption, effectiveness, and sustainability of Good Agricultural Practices (GAP) among rice farmers in Central Luzon:

- Strengthening and Expansion of GAP Promotion Programs. GAP awareness programs should be continuously strengthened and expanded through sustained extension services and integration into regular agricultural development initiatives. Since awareness alone was found insufficient to drive adoption, promotional efforts should go beyond information dissemination and focus on behavior change communication. Community-based approaches such as farmer field days, demonstration farms, and peer-to-peer learning should be intensified to encourage wider adoption and normalization of GAP practices at the grassroots level.
- Institutionalization of Continuous and Practical Training Programs. Given that training exposure is the most significant factor influencing GAP adoption, regular, structured, and field-based training programs should be institutionalized. These should emphasize hands-on learning rather than lecture-based sessions alone. Training content should include core GAP practices as well as additional modules on postharvest handling, value addition, farm business management, and marketing to strengthen the

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entire agricultural value chain. Refresher trainings and mentoring support should also be conducted to ensure long-term retention and application of knowledge.

- Strengthening Government Support and Extension Services. Government agencies, particularly the Department of Agriculture and Municipal Agriculture Offices, should intensify technical assistance, monitoring, and advisory services to farmers. Financial support mechanisms such as subsidies, input assistance, and accessible credit facilities should be expanded to help farmers overcome cost-related constraints. Stronger field-level extension presence is necessary to bridge the gap between knowledge and actual farm implementation.
- Enhancement of Market Linkages and Economic Incentives. To encourage sustained compliance with GAP standards, structured and reliable market systems for GAP-certified products should be developed. This includes establishing dedicated marketing channels, strengthening value chain integration, and ensuring premium or stable pricing for compliant produce. These incentives are essential in addressing farmers' concerns regarding limited market rewards for adopting GAP practices.
- Improvement of Farm Infrastructure and Mechanization Support. Farm-level infrastructure such as irrigation systems, postharvest facilities, storage units, and drying areas should be improved to support efficient and compliant farming operations. Mechanization support should also be strengthened to reduce labor intensity, which was identified as a major barrier to adoption. These improvements will enhance productivity and reduce operational constraints associated with GAP compliance.
- Simplification and Support for Certification Processes. Since certification was identified as complex and costly, the process should be simplified and made more accessible to farmers. Financial assistance or subsidy schemes for certification should be considered to encourage wider participation. Technical support teams should also be deployed to assist farmers throughout the certification process, ensuring that procedural barriers do not discourage adoption.
- Development of Integrated and Sustainable GAP Support Systems. A holistic and integrated support system combining training, financial assistance, monitoring, input support, and market facilitation should be established. This system should ensure continuity and sustainability of GAP adoption beyond project-based interventions. Coordination among government agencies, LGUs, and private stakeholders is essential to sustain long-term implementation.
- Strengthening Farmer Organizations and Institutional Collaboration. Farmer cooperatives and organizations should be strengthened as key delivery platforms for GAP adoption. Their role in peer learning, collective marketing, and coordination with government programs should be enhanced. Greater participation of farmers in planning and decision-making processes should also be encouraged to ensure that interventions are responsive to local needs and conditions.

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APPENDICES

APPENDIX A

Survey Questionnaire

KUESTYONARYO SA PAG-AMIN AT PAGSUSURI NG EPEKTO NG GAP

- *Pamagat ng Pag-aaral:*
  Adoption of Good Agricultural Practices (GAP) and Their Role in Rural Development in Central Luzon: An Assessment

Mananaliksik: Alvin A. Butay

Petsa ng Panayam: _____

Bayan/Barangay: _____

Code ng Magsasaka (kumpidensyal):

A. Seksyon A: Sosyo-Demograpiko at Profile Ng Sakahan

- *A.1.Sosyo-Demograpikong Profile*

- Buong Pangalan (Opsyonal): _____
- Edad: _____ taon
- Kasarian:

☐ Lalaki
☐ Babae

- Katayuan Sibil:

☐ Binata/Dalaga
☐ May-asawa
☐ Balo
☐ Hiwalay

- Pinakamataas na Antas ng Edukasyon:

☐ Walang pormal na edukasyon
☐ Nagtapos ng Elementarya
☐ Nagtapos ng High School
☐ Bokasyonal/Teknikal
☐ Nakatapos ng ilang taon sa Kolehiyo
☐ Nagtapos ng Kolehiyo

- Taon ng Karanasan sa Pagsasaka: _____ taon

- Uri ng pagmamay-ari ng lupa:

☐ Sariling lupa
☐ Upa/Tenant
☐ Leasehold
☐ Stewardship

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☐ Iba pa:

- Bilang ng miyembro ng pamilya (magkakasama sa iisang bubong): _____
- Kabilang ka ba sa kooperatiba o organisasyon ng magsasaka?

☐ Oo (Pangalan: _____)
☐ Hindi

➢ *Institusyunal*

- Sukat ng sakahan (ektarya): _____ ha.
- Layo ng Sakahan sa Pinakamalapit na Pamilihan:_____km

➢ *Biyopisikal*

- May patubig ba ang iyong sakahan?

☐ Oo
☐ Hindi

- Pangunahing pinagmumulan ng patubig:

☐ Ulan (Rainfed)
☐ Komunal na irigasyon
☐ Pribadong bomba
☐ Sistema ng NIA
☐ Iba pa: _____

- *Katayuan ng Sustansiya sa Lupa (kung alam):*

Partikular	Napakababa	Mababa	Katamtaman	Mataas	Napakataas
Nitrogen (N)	☐	☐	☐	☐	☐
Phosphorus (P)	☐	☐	☐	☐	☐
Potassium (K)	☐	☐	☐	☐	☐

➢ *Ekonomiko*

- *Ilagay yung gastos, ani at kita sa pagsasaka*

Partikular	Dati	Kasalukuyan
Gastos sa Produksyon (Php/ha)		
Ani (kg/ha)		
Kita sa pagsasaka (Php/ha)		

B. Seksyon B: Kaalaman at Kamalayan Sa Good Agricultural Practices (Gap)

Partikular	Walang kaalaman	Kaunting kaalaman	Medyo may kaalaman	May sapat na kaalaman	Sobrang may kaalaman
A. GAP Principles					
1. Itinataguyod ng GAP ang ligtas at napapanatiling produksyon.					
2. Kasama sa GAP ang kaligtasan at kalinisan ng manggagawa.					

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3. Binibigyang-diin ng GAP ang pagtatala at pagsubaybay sa mga gawain sa bukid.					
B. GAP Benefits					
1. Pinapataas ng GAP ang akses sa 3818ercado (3818erca/premium/eksport).					
2. Pinahuhusay ng GAP ang kalidad at kaligtasan ng produkto.					
3. Binabawasan ng GAP ang masamang epekto sa kapaligiran.					
C. **GAP Requirements**					
1. Kinakailangan ng GAP ang tamang paghawak at pag-imbak ng pestisidyo.					
2. Kinakailangan ng GAP ang kalinisan at tamang pamamahala ng basura sa sakahan.					
3. Kinakailangan ng GAP ang regular na pagtatala ng mga gawaing pangsaka.					

C. Seksyon C. Pagdalo Sa Pagsasanay

- *Narinig mo na ba ang tungkol sa Good Agricultural Practices (GAP)?*

☐ Oo
☐ Hindi (Kung Hindi, lumaktaw sa Seksyon D)

- *Kung Oo, saan mo ito natutunan? (Maaari pumili ng higit sa isa)*

☐ Department of Agriculture
☐ Municipal Agriculture Office
☐ Kooperatiba ng magsasaka
☐ Pagsasanay/Seminar
☐ TV/Radio
☐ Social Media
☐ Kapwa magsasaka
☐ Iba pa: _____

- *Dumalo ka na ba sa pormal na pagsasanay tungkol sa GAP?*

☐ Oo (Bilang ng training: _____ | Taon: _____)
☐ Hindi

- *Kung oo, sino ang nagsagawa ng training?*

☐ Ahensya ng Gobyerno
☐ NGO
☐ Pribadong Sektor
☐ Kooperatiba
☐ Iba pa (ilagay):_____

- *Kahalagahan ng Pagsananay*

☐ Hindi mahalaga
☐ Bahagyang hindi mahalaga

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☐ Neutral
☐ Medyo mahalaga
☐ Lubos na mahalaga

- *May kopya ka ba ng GAP manual o guidelines?*

☐ Oo
☐ Hindi

- *Paki-rate ang iyong antas na 1 hanggang 5, kung gaano ang iyong kaalaman tungkol sa GAP.*

Partikular	Lubos na hindi sumasang-ayon	Hindi Sumasang-Ayon	Neither	Sumasang-Ayon	Lubos na sumasang-ayon
1. Ang mga pagsasanay na dinaluhan ko ay angkop sa aking pangangailangan.					
2. Madalas kong naiaangkop ang aking natutunan mula sa mga pagsasanay.					
3. Dinaluhan ko rin ang iba pang kapaki-pakinabang na pagsasanay (postharvest, marketing, atbp.).					

D. Seksyon D. Katayuan Ng Gap Certification

Partikular	Lubos na hindi sumasang-ayon	Hindi Sumasang-Ayon	Neither	Sumasang-Ayon	Lubos na sumasang-ayon
1. Madali ang proseso ng GAP certification sa aming lugar.					
2. Abot-kaya ang gastos sa certification.					
3. Kayang panatilihin ng aking sakahan ang mga kailangan sa compliance.					
4. May sapat na tulong mula sa gobyerno o ahensya sa panahon ng certification.					

E. Seksyon E. Antas Ng Pagpapatupad Ng Gap

- *Alin sa mga sumusunod na pamantayan/praktis ng GAP ang iyong nagawa?*

Pahayag	Hindi Isinasagawa (1)	Bihira (2)	Paminsan-minsan (3)	Madalas (4)	Palagi (5)
1. Nagsasagawa ako ng pagsusuri sa lupa at tubig bago magtanim.					
2. Naglalagay ako ng abono batay sa rekomendasyon ng soil test.					
3. Ipinapatupad ko ang integrated pest management (IPM).					
4. Gumagamit ako ng proteksiyon sa katawan kapag nag-aapply ng pestisidyo.					

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5. Isinasagawa ko ang tamang pagtatapon ng basura at kalinisan sa sakahan.					
6. Naglalagay ako ng mga tala ng input, aktibidad sa bukid, at ani.					
7. Sinusunod ko ang tamang postharvest handling para mapanatili ang kalidad.					
8. Lumalahok ako sa mga inspeksyon sa bukid na may kinalaman sa GAP					
9. Tinatanggap ko at ipinapatupad ang mga bagong rekomendasyon sa pagsasaka.					
10. Patuloy kong sinusuri at pinagbubuti ang aking mga 3820ercad sa bukid.					

F. Seksyon F: Mga Salik Na Nakatutulong and Nakahahadlang (Enablers & Barriers)

Partikular	**Lubos na hindi sumasang-ayon**	**Hindi Sumasang-Ayon**	**Neither**	**Sumasang-Ayon**	**Lubos na sumasang-ayon**
A. Enablers					
1. Ang suporta ng gobyerno (subsidy, programa) ay nakahihikayat sa GAP adoption.					
2. May pamilihan o demand para sa produktong may GAP certification.					
3. May sapat na training at technical assistance na ibinibigay.					
B. Barriers					
1. Matagal at komplikado ang mga requirement para sa certification.					
2. Mataas ang gastos sa pagpapacertify.					
3. Kulang sa puhunan para ipatupad ang mga kinakailangang 3820ercad.					
4. Limitado ang 3820ercado para sa mga produktong may GAP certification.					

G. Seksyon G. Mga Hamon, Suliranin, At Mungkahing Suporta (Open-Ended)

- *Ano ang tatlong pangunahing hamon na inyong nararanasan sa pagpapatupad ng GAP?*

a. _____
b. _____
c. _____

- Anong uri ng tulong o programa ang makatutulong upang mapanatili ang GAP adoption? (e.g., subsidy, training, market linkage, loan assistance, atbp.)
- Mayroon pa po ba kayong iba pang mungkahi o komento?

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APPENDIX B
(INTERVIEW GUIDE FOR THE KEY INFORMANTS)

GABAY PARA SA KEY INFORMANT INTERVIEW (KII)

➢ *Layunin:*

Layunin ng panayam na ito na makakalap ng mas malalim na impormasyon mula sa mga eksperto sa agrikultura, kinatawan ng 3821erca na pamahalaan, at iba pang stakeholder tungkol sa implementasyon, kaalaman, hamon, at pagpapanatili ng Good Agricultural Practices (GAP) ng mga magsasakang nagtatanim ng palay sa Gitnang Luzon.

➢ *Impormasyon ng Respondente*

- Pangalan (opsyonal):
- Posisyon/Trabaho:
- Organisasyon/Ahensiya:
- Probinsya / Munisipalidad:
- Petsa:
- Interbiyuwer:

➢ *Impormasyon sa Background*

- Maaari mo bang ilarawan ang iyong papel o partisipasyon sa pagpapatupad o promosyon ng GAP sa inyong lugar?

➢ *Bilang LGU / Municipal Agriculture Office*

- Ako ang namumuno sa pag-oorganisa ng GAP trainings para sa mga magsasaka."
- Tumutulong ako sa pag-monitor ng mga bukirin na nais magpa-GAP certify."
- Ako ang gumagawa ng coordination sa pagitan ng DA, barangay, at mga farmer groups para sa GAP activities."
- Ako ang tagapangasiwa ng mga project proposal at reporting na may kinalaman sa GAP."
- Ako ang nagbibigay ng technical advisories at farm visits upang masiguro ang pagsunod sa GAP standards.
- Tumutulong kami 3821ercad-develop ng market linkages para sa mga GAP-certified farmers.

➢ *DA / Regional Office Staff*

- Kami ang nagdi-distribute ng training materials at nagfa-facilitate ng regional GAP orientations."
- Kasama ako sa team na nagva-validate at nag-iinspeksyon ng mga bukirin na nag-aapply para sa GAP certification."
- Tumutulong ako sa pagbuo ng guidelines at monitoring forms para sa GAP implementation."
- Ako ang nagbibigay ng technical support sa LGU para sa pagsasagawa ng GAP trainings

➢ *Bilang Agriculturists, Agricultural Technologists (AT)*

- Ako ang frontliner na nag-iinform at nag-eengganyo sa mga magsasaka na mag-adopt ng GAP."
- Ako ang tumutulong sa pagfill-up ng application forms at pagpapasa ng requirements para sa certification."
- Regular akong bumibisita sa mga bukirin para gabayan ang magsasaka sa tamang documentation at record keeping."
- Ako ang nagtuturo ng tamang paggamit ng fertilizers, pesticides, at farm inputs ayon sa GAP standards."

➢ *Bilang Farmer Leaders / Cooperative Representatives*

- Ako ang nagbabahagi ng impormasyon tungkol sa GAP sa aming mga kasamahan sa kooperatiba."
- Tumutulong ako 3821ercad-organize ng group applications para sa GAP certification."
- Ako ang nagsisilbing liaison sa DA at LGU para maayos ang requirements ng aming grupo."
- Ako ang nagmo-monitor ng compliance ng mga kasapi sa aming cluster farming system."

➢ *NGO / Private Sector*

- Kami ang nagbibigay ng capacity-building activities tulad ng seminars at field demonstrations tungkol sa GAP."
- Tumutulong kami 3821ercad-develop ng market linkages para sa mga GAP-certified farmers.
- Nagpo-provide kami ng support materials tulad ng PPEs, logbooks, at farm signage para sa GAP compliance.

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- Kasama kami sa advocacy at information campaigns sa mga komunidad tungkol sa importance ng GAP.

- *Gaano ka na katagal na kasali sa mga aktibidad na may kinalaman sa GAP certification o monitoring?*

✓ 1-2 na taon
✓ 2- 4 na taon
✓ 4-6 na taon
✓ 6-8 na taon
✓ 8-10na taon
✓ 10- 12 na taon

- *Anong mga programa o proyekto tungkol sa GAP ang kasalukuyang isinasagawa ng inyong opisina o organisasyon?*

✓ Kasama kami sa LGU GAP Promotion Program na nakatuon sa training, monitoring, at application assistance."
✓ Isinasagawa 3822ercad ang DA's National GAP Program, kasama ang assessment, inspection, at certification endorsement."
✓ Meron kaming cluster-based GAP adoption program, at tumutulong kami sa collective certification."
✓ Mayroon kaming community-based project na tumutulong sa maliit na magsasaka na ma-meet ang GAP standards."

➢ *Kaalaman at Promosyon ng GAP*

- *Paano mo ilalarawan ang antas ng kaalaman ng mga magsasaka tungkol sa GAP at sa mga benepisyo nito?*

✓ Kilala nila ang terminong GAP pero hindi pa lubos nauunawaan ang benepisyo tulad ng food safety at market premium.
✓ Alam ng ilan ang benepisyo gaya ng mas ligtas na ani, mas mataas na presyo, at mas 3822ercado3822g kalidad ng produkto.
✓ Yung mga trained farmers ay fully aware na nakakatulong ang GAP sa mas ligtas na pagkain, mas mataas 3822ercado, at mas maayos na farm management.

- *Anong mga paraan o estratehiya ang ginagamit 3822erca para i-promote ang GAP (hal. Pagsasanay, seminar, demo farm)?*

✓ Trainings at Capacity Building
✓ Seminars, Meetings, and Information Sessions
✓ Demonstration Farms / Model Farms
✓ Technical Assistance and Field Visits
✓ Partnership and Collaboration
✓ Market-Based Promotion
✓ Incentives and Support Programs

- *Gaano kaepektibo ang mga paraang ito sa paghikayat sa mga magsasaka na mag-adopt ng GAP?*

✓ Training-focused
✓ Demo Farm ang Strategy
✓ IEC Materials at Social Media
✓ Technical Assistance

➢ *Pagsasanay at Pagpapalakas ng Kakayahan*

- *Anong uri ng pagsasanay o teknikal na tulong tungkol sa GAP ang ibinibigay sa mga magsasaka?*

✓ Trainings on Farm Management and Production
✓ Pesticide Safety and Chemical Handling
✓ Farm Hygiene and Sanitation
✓ Record Keeping and Documentation
✓ Harvest and Post-Harvest Handling
✓ Demo Farm-Based Learning
✓ Technical Assistance and Field Monitoring
✓ Market and Certification Support

- *Gaano kadalas ginagawa ang mga pagsasanay, at sino ang nagsasagawa nito?*

✓ taun-taon

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- ✓ bawat cropping season
- ✓ Quarterly trainings
- ✓ Tuwing may certification

- *Sino ang nagsasagawa nito?*

- ✓ Local Government / Municipal Agriculture Office
- ✓ Department of Agriculture (DA)
- ✓ Agricultural Training Institute (ATI)
- ✓ PhilRice / Research Institutions
- ✓ Cooperatives / Farmer Organizations
- ✓ Private Sector / NGOs

- *Sa iyong obserbasyon, aling mga paksa o kasanayan sa GAP training ang pinakakapaki-pakinabang para sa mga magsasaka?*

- ✓ Pesticide Safety at Chemical Management
- ✓ Fertilizer Management at Soil Health
- ✓ Farm Hygiene and Sanitation
- ✓ Record Keeping and Documentation
- ✓ Harvest at Post-Harvest Handling
- ✓ Water and Field Management
- ✓ Actual Farm Demonstrations
- ✓ GAP Certification Requirements

- *3823ercado3823 ang pondo, tao, at materyales para maipagpatuloy ang mga pagsasanay?*

- ✓ Oo, sapat ang pondo, tao, at materyales para regular na isagawa ang training."
- ✓ Medyo sapat lang; may kulang sa manpower at budget para sa mas maraming farmers
- ✓ Hindi sapat ang resources kaya limitado lang ang bilang ng trainings at coverage."

➢ *GAP Certification at Pagsunod*

- *Gaano kadaling ma-access ng mga magsasaka ang proseso ng GAP certification?*

- ✓ Medyo madali, lalo na kung may tulong mula sa MAO o cooperative.
- ✓ Katamtaman lang, kailangan pa ng assistance sa documentation at requirements.
- ✓ Mahirap, lalo na sa mga malalayong lugar at sa farmers na walang technical support.

- *Ano ang karaniwang mga hamon o problema na nararanasan ng magsasaka sa proseso ng certification?*

- ✓ Mataas ang gastos at mahirap ang record keeping para sa mga farmers.
- ✓ Mahirap sundan ang mga requirements at kulang sa technical support sa farm preparation.
- ✓ May logistical challenges tulad ng malalayong opisina at kakulangan sa manpower at panahon.
- ✓ at iba pa… (pakisabi po ito)

- *Ano ang pananaw ng mga magsasaka tungkol sa gastos at benepisyo ng pagkakaroon ng GAP certification?*

- ✓ Alam ng farmers ang benepisyo ng GAP certification, pero iniisip 3823ercado medyo mataas ang gastos.
- ✓ Sulit ang gastos dahil nagbubunga ng mas mataas 3823ercado at access sa premium markets.
- ✓ May mixed perception; may handa sa gastos kapag nakikita ang benefits, at may nagdadalawang-isip dahil sa complexity at cost.

- *May sapat ba na suporta at monitoring para tulungan ang mga magsasaka pagkatapos nilang ma-certify?*

- ✓ Oo, may regular follow-up at technical support para tulungan silang panatilihin ang GAP standards.
- ✓ Katamtaman lang; may monitoring pero hindi regular at kulang sa resources."
- ✓ Hindi sapat; kulang ang post-certification support at may farmers na nahihirapang sumunod sa standards.

➢ *Mga Nagpapalakas at Hadlang sa Adoption ng GAP*

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- *Sa iyong palagay, ano ang mga pangunahing dahilan kung bakit naa-engganyo ang mga magsasaka na mag-adopt ng GAP? (hal. Suporta ng gobyerno, demand ng 3824ercado, tulong ng kooperatiba, subsidy)*

✓ Suporta ng gobyerno, demand sa 3824ercado, at tulong ng kooperatiba ang pangunahing dahilan."
✓ May financial incentives, market opportunity, at technical guidance mula sa LGU at DA.
✓ Motivated ang farmers dahil sa higher price, peer support, at food safety awareness."

- *Ano naman ang pangunahing hadlang o dahilan kung bakit hindi sila nag-aadopt ng GAP? (hal. Gastos, komplikadong requirements, kakulangan sa kaalaman, maliit na insentibo sa 3824ercado)*

✓ Mataas na gastos at komplikadong requirements.
✓ May kakulangan sa kaalaman at technical support, at maliit ang market incentive para sa certification.
✓ Panahon, manpower, at accessibility issues ang hadlang, pati na rin ang resistance sa pagbabago.

➢ *Epekto at Pagpapanatili*

- *Sa iyong obserbasyon, paano nakaapekto ang GAP sa produksyon ng palay, kita ng magsasaka, at kalikasan?*

✓ Mas mataas ang ani, mas 3824ercad ang kita sa premium markets, at mas sustainable ang kalikasan dahil sa tamang GAP practices
✓ Konting improvement sa produksyon, kita tumaas kung may market, at mas maayos ang paggamit ng chemical at resources.
✓ Positibo ang epekto sa farm management at kalikasan, pero kailangan pa ng market access para tumaas ang kita

- *Sa tingin mo ba, napataas ng GAP ang pagiging competitive ng magsasaka o pag-access nila sa mas 3824ercado3824g 3824ercado?*

✓ May regular monitoring, refresher trainings, market access, at technical support para mapanatili ang GAP adoption."
✓ Suportado ng cooperatives, LGU, at DA; may incentives at continuous capacity building."
✓ Farmer engagement, policy support, at follow-up visits ang ginagawa para maging sustainable ang GAP practices."

- *Anong mga hakbang ang ginagawa upang mapanatili ang adoption ng GAP pangmatagalan?*

✓ Regular monitoring, refresher trainings, market access, at technical support ang ginagawa para mapanatili ang GAP adoption."
✓ Suportado ng cooperatives, LGU, at DA; may incentives at continuous capacity building para sa farmers."
✓ Farmer engagement, policy support, at follow-up visits ang ginagawa para maging sustainable ang GAP practices."

➢ *Rekomendasyon at Patakarang Pangkaunlaran*

- *Anong mga polisiya o hakbang ng institusyon ang makakatulong upang mas mapalakas ang GAP adoption sa inyong lugar?*

✓ pagbibigay ng libreng training at sertipikasyon,
✓ pagbibigay ng financial incentives sa mga magsasaka,
✓ pagbibigay ng mas madaling proseso ng monitoring at sertipikasyon,
✓ pagpapalawak ng merkado para sa GAP-compliant na produkto, at
✓ pakikipagtulungan ng LGU, NGOs, at pribadong sektor.

- *Anong uri ng suporta (pinansyal, teknikal, institusyonal) ang makakatulong upang mas maraming magsasaka ang sumali sa GAP?*

✓ Pinansyal – tulong sa pagbili ng inputs at kagamitan
✓ Teknikal – libreng training at gabay sa implementasyon ng GAP
✓ Institusyonal- tulong sa sertipikasyon, monitoring, at pakikipag-ugnayan sa 3824ercado at mga organisasyon

- *Mayroon ka bang best practices o success stories tungkol sa GAP na maaari mong ibahagi?*

- *Ano ang iyong mga rekomendasyon upang mas mapabuti ang implementasyon ng GAP sa mga magsasakang nagtatanim ng palay sa Gitnang Luzon?*

✓ Mas maraming training at "field-school" para sa GAP sa palay
✓ Suporta sa pinansyal at teknikal

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- ✓ Pagpapalaganap ng mga demo farms o GAP-certified farms bilang halimbawa
- ✓ Pag-link sa 3825ercado: siguraduhing may “market advantage” ang GAP-certified na palay
- ✓ Simplipikadong proseso at teknikal na gabay para sa certification
- ✓ Pag-integrate ng GAP sa mga kasalukuyang programa at tulong ng gobyerno
- ✓ Pagtulong para sa tamang water management at sustainable practices

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may1241

APPENDIX C

Communication Letters for the Bureau of Plant Industry and Department of Agriculture Regional Filed Office 3

December 10, 2025

DR. GERALD GLENN F. PANGANIBAN
Director
Bureau of Plant Industry
Department of Agriculture
692 San Andres Street, Malate Metro Manila

Attention: **MR. WILLIAM MUGOT**
Chief, Plant Product Safety Services Division

Dear Director Panganiban:

Good day.

I respectfully write to request access to relevant data from your good office in support of my dissertation proposal entitled **"Adoption of Good Agricultural Practices (GAP) and Their Role in Rural Development in Central Luzon: An Assessment."** I am currently pursuing my degree as a **Ph.D. Student at Tarlac Agricultural University**, and the said study aims to assess the level of GAP adoption in the region and evaluate its contributions to rural development.

In line with this academic endeavor, may I kindly request the following information from your office:

1. **List of GAP RICE-compliant farmers and/or farms in Central Luzon**
2. **Basic information**, including but not limited to:
    - Name of farmer or farm
    - Location (province and municipality)
    - Crop or commodity
    - Area per commodity
    - Year of GAP certification
3. Any **additional data or documentation** related to agricultural practices or indicators that may support the assessment of GAP adoption and its impacts.

Rest assured that all data obtained will be used **strictly for academic and research purposes** and will be handled with utmost confidentiality in adherence to the Data Privacy Act of 2012. The output of this study also aims to contribute to evidence-based policymaking, extension planning, and the strengthening of agricultural programs in Central Luzon.

I sincerely hope for your favorable consideration of this request. Your assistance will greatly support the completion of my dissertation and further enrich the academic and developmental value of this research.

Thank you very much, and I look forward to your positive response.

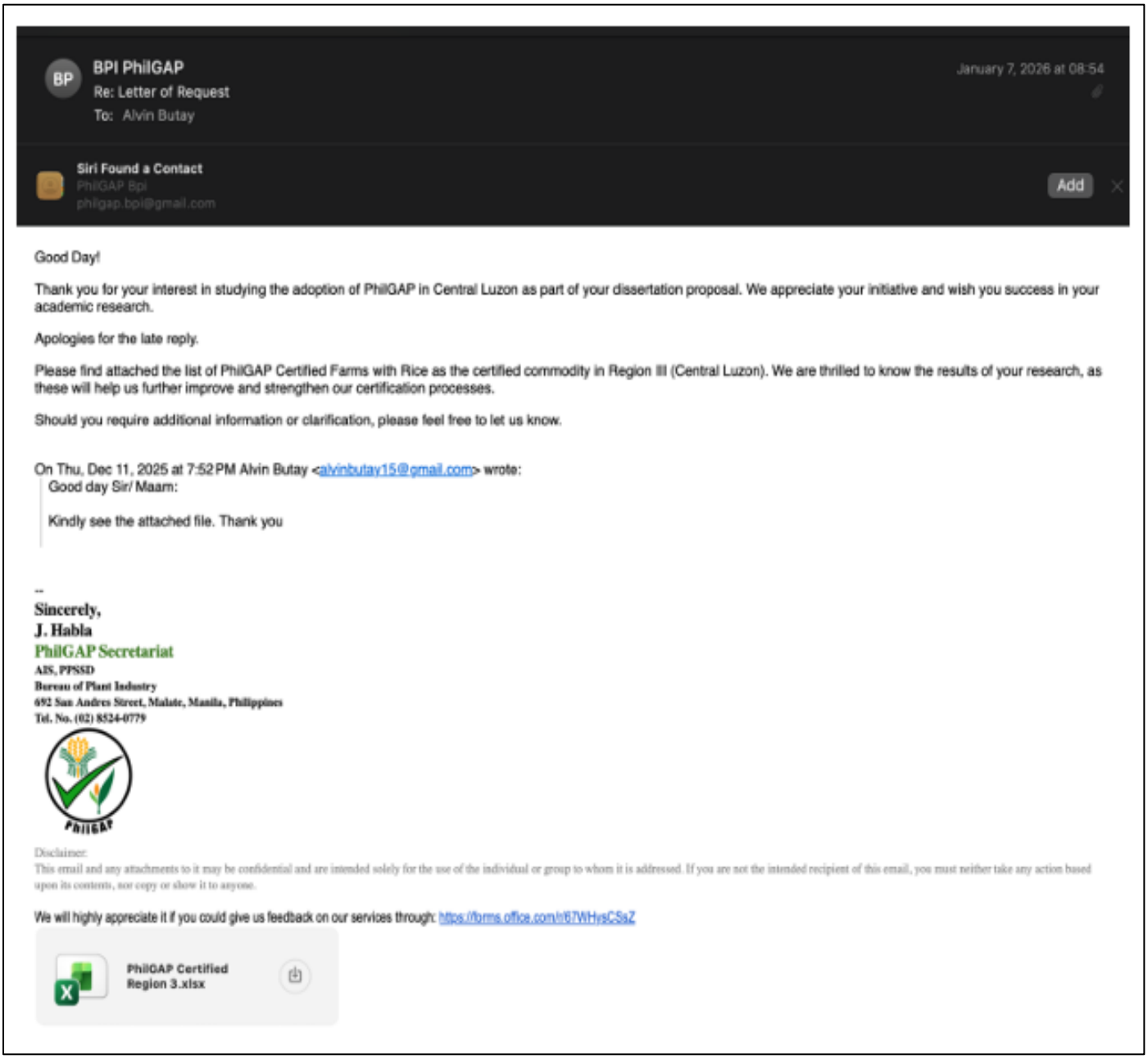
Respectfully yours,

ALVIN A. BUTAY
Ph.D. Student
Email: alvinbutay15@gmail.com
Mobile: 0998 852 7459

Noted:

DR. AGNES C. PEREY
Research Adviser
Associate Professor V
Tarlac Agricultural University

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may1241



BP

BPI PhilGAP
Re: Letter of Request
To: Alvin Butay

January 7, 2026 at 08:54

Siri Found a Contact
PhilGAP Bpi
philgap.bpi@gmail.com

Add

Good Day!

Thank you for your interest in studying the adoption of PhilGAP in Central Luzon as part of your dissertation proposal. We appreciate your initiative and wish you success in your academic research.

Apologies for the late reply.

Please find attached the list of PhilGAP Certified Farms with Rice as the certified commodity in Region III (Central Luzon). We are thrilled to know the results of your research, as these will help us further improve and strengthen our certification processes.

Should you require additional information or clarification, please feel free to let us know.

On Thu, Dec 11, 2025 at 7:52 PM Alvin Butay <alvinbutay15@gmail.com> wrote:

> Good day Sir/ Maam:
>
> Kindly see the attached file. Thank you

--
Sincerely,
J. Habla
PhilGAP Secretariat
AIS, PPSSD
Bureau of Plant Industry
692 San Andres Street, Malate, Manila, Philippines
Tel. No. (02) 8524-0779

PHILGAP

Disclaimer:
This email and any attachments to it may be confidential and are intended solely for the use of the individual or group to whom it is addressed. If you are not the intended recipient of this email, you must neither take any action based upon its contents, nor copy or show it to anyone.

We will highly appreciate it if you could give us feedback on our services through: https://forms.office.com/r/67WHysCSaZ

PhilGAP Certified Region 3.xlsx

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November 18, 2025

DR. EDUARDO L. LAPUZ, JR.
Regional Executive Director
Department of Agriculture – Regional Field Office III
Diosdado Macapagal Government Center
Brgy. Maimpis, City of San Fernando, Pampanga

Attention: **Dr. XANDRE D. BACCAY**
Chief, Regulatory Division

Dear Director Lapuz:

Good day.

I respectfully write to request access to relevant data from your good office in support of my dissertation proposal entitled **"Adoption of Good Agricultural Practices (GAP) and Their Role in Rural Development in Central Luzon: An Assessment."** I am currently pursuing my degree as a **Ph.D. Student at Tarlac Agricultural University**, and the said study aims to assess the level of GAP adoption in the region and evaluate its contributions to rural development.

In line with this academic endeavor, may I kindly request the following information from your office:

1. **List of GAP-compliant farmers and/or farms in Central Luzon**
2. **Basic information**, including but not limited to:
   - Name of farmer or farm
   - Location (province and municipality)
   - Crop or commodity
   - Area per commodity
   - Year of GAP certification
3. Any **additional data or documentation** related to agricultural practices or indicators that may support the assessment of GAP adoption and its impacts.

Rest assured that all data obtained will be used **strictly for academic and research purposes** and will be handled with utmost confidentiality in adherence to the Data Privacy Act of 2012. The output of this study also aims to contribute to evidence-based policymaking, extension planning, and the strengthening of agricultural programs in Central Luzon.

I sincerely hope for your favorable consideration of this request. Your assistance will greatly support the completion of my dissertation and further enrich the academic and developmental value of this research.

Thank you very much, and I look forward to your positive response.

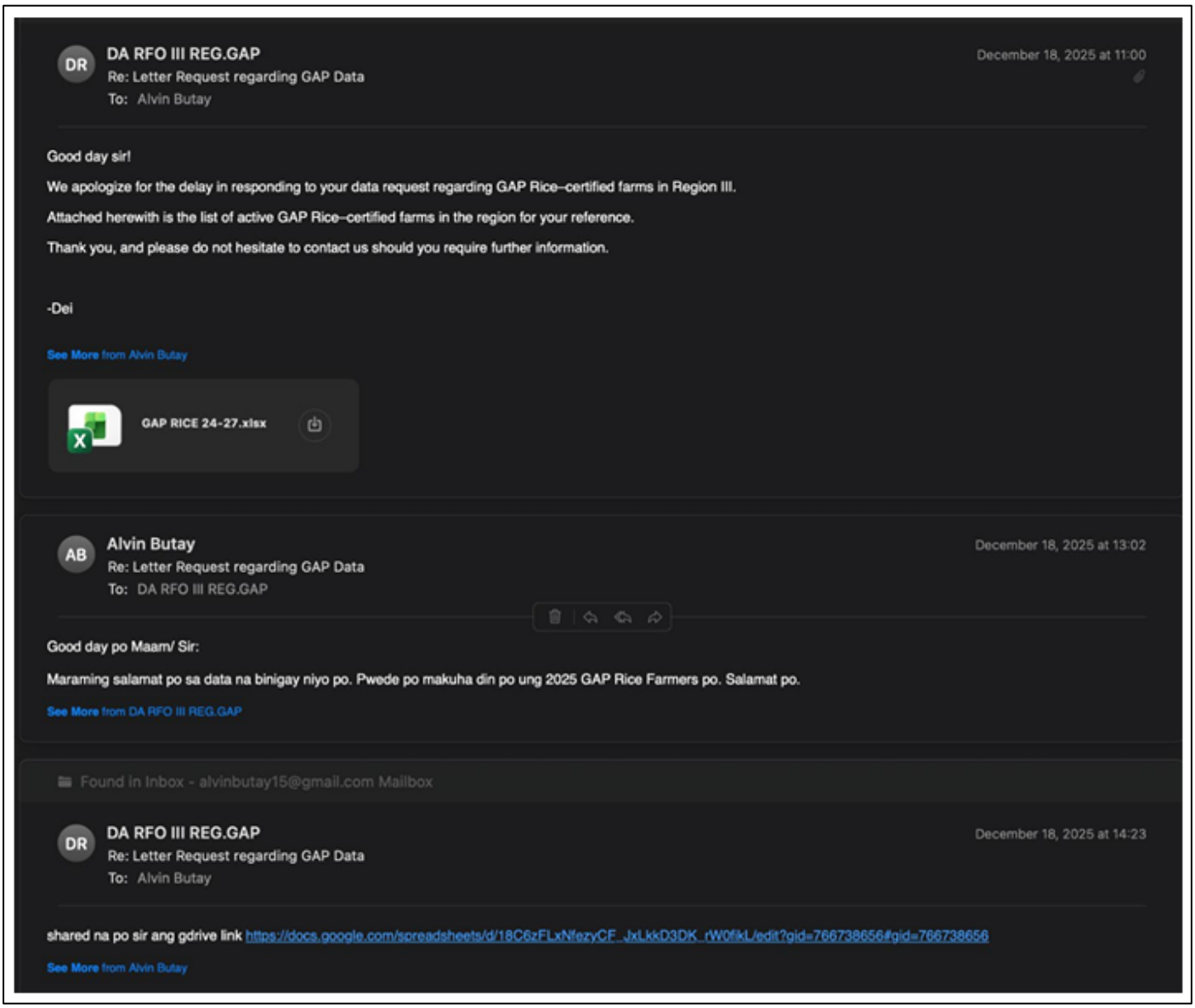
Respectfully yours,

ALVEN A. BUTAY
Ph.D. Student
Email: alvinbutay15@gmail.com
Mobile: 0998 852 7459

Noted:

DR. AGNES C. PEREY
Research Adviser
Associate Professor V
Tarlac Agricultural University

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may1241



DR **DA RFO III REG.GAP** December 18, 2025 at 11:00
Re: Letter Request regarding GAP Data
To: Alvin Butay

Good day sir!

We apologize for the delay in responding to your data request regarding GAP Rice–certified farms in Region III.

Attached herewith is the list of active GAP Rice–certified farms in the region for your reference.

Thank you, and please do not hesitate to contact us should you require further information.

-Dei

See More from Alvin Butay

GAP RICE 24-27.xlsx

AB **Alvin Butay** December 18, 2025 at 13:02
Re: Letter Request regarding GAP Data
To: DA RFO III REG.GAP

Good day po Maam/ Sir:

Maraming salamat po sa data na binigay niyo po. Pwede po makuha din po ung 2025 GAP Rice Farmers po. Salamat po.

See More from DA RFO III REG.GAP

Found in Inbox - alvinbutay15@gmail.com Mailbox

DR **DA RFO III REG.GAP** December 18, 2025 at 14:23
Re: Letter Request regarding GAP Data
To: Alvin Butay

shared na po sir ang gdrive link https://docs.google.com/spreadsheets/d/18C6zFLxNfezyCF_JxLkkD3DK_rW0fkL/edit?gid=766738656#gid=766738656

See More from Alvin Butay

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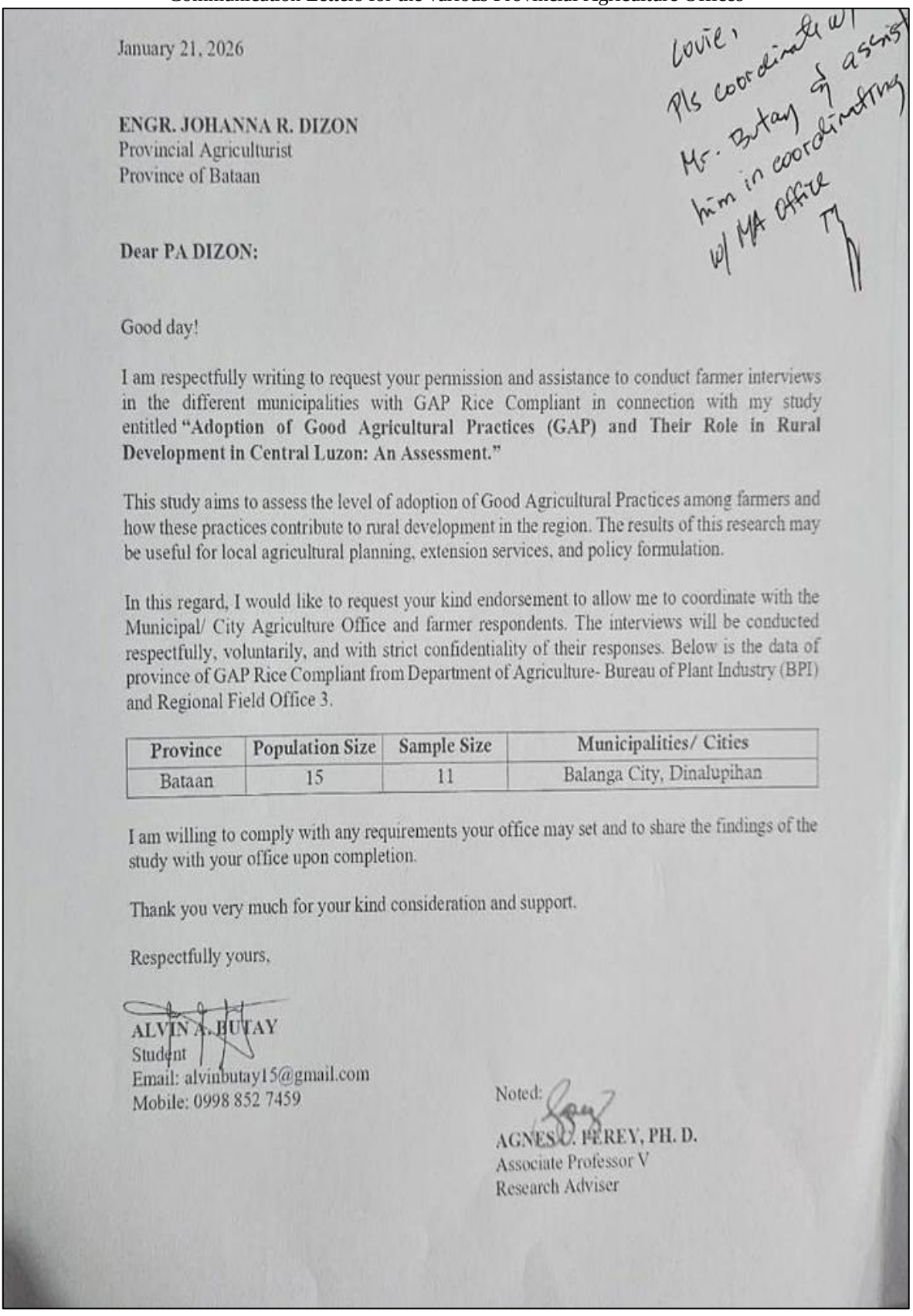
APPENDIX D

Communication Letters for the various Provincial Agriculture Offices



January 21, 2026

Louie,
Pls coordinate w/ Ms. Butay & assist him in coordinating w/ MA office
TY

ENGR. JOHANNA R. DIZON
Provincial Agriculturist
Province of Bataan

Dear PA DIZON:

Good day!

I am respectfully writing to request your permission and assistance to conduct farmer interviews in the different municipalities with GAP Rice Compliant in connection with my study entitled **"Adoption of Good Agricultural Practices (GAP) and Their Role in Rural Development in Central Luzon: An Assessment."**

This study aims to assess the level of adoption of Good Agricultural Practices among farmers and how these practices contribute to rural development in the region. The results of this research may be useful for local agricultural planning, extension services, and policy formulation.

In this regard, I would like to request your kind endorsement to allow me to coordinate with the Municipal/ City Agriculture Office and farmer respondents. The interviews will be conducted respectfully, voluntarily, and with strict confidentiality of their responses. Below is the data of province of GAP Rice Compliant from Department of Agriculture- Bureau of Plant Industry (BPI) and Regional Field Office 3.

Province	Population Size	Sample Size	Municipalities/ Cities
Bataan	15	11	Balanga City, Dinalupihan

I am willing to comply with any requirements your office may set and to share the findings of the study with your office upon completion.

Thank you very much for your kind consideration and support.

Respectfully yours,

ALVIN A. BUTAY
Student
Email: alvinbutay15@gmail.com
Mobile: 0998 852 7459

Noted:

AGNES C. PEREY, PH. D.
Associate Professor V
Research Adviser

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may1241

January 21, 2026

NOEL C. REGIS
Provincial Agriculturist
Province of Tarlac

Dear PA REGIS:

Good day!

I am respectfully writing to request your permission and assistance to conduct farmer interviews in the different municipalities with GAP Rice Compliant in connection with my study entitled **"Adoption of Good Agricultural Practices (GAP) and Their Role in Rural Development in Central Luzon: An Assessment."**

This study aims to assess the level of adoption of Good Agricultural Practices among farmers and how these practices contribute to rural development in the region. The results of this research may be useful for local agricultural planning, extension services, and policy formulation.

In this regard, I would like to request your kind endorsement to allow me to coordinate with the Municipal Agriculture Office and farmer respondents. The interviews will be conducted respectfully, voluntarily, and with strict confidentiality of their responses. Below is the data of province of GAP Rice Compliant from Department of Agriculture- Bureau of Plant Industry (BPI) and Regional Field Office 3.

Province	Population Size	Sample Size	Municipalities
Tarlac	47	35	Gerona, Sta Ignacia, Anao, San Manuel

I am willing to comply with any requirements your office may set and to share the findings of the study with your office upon completion.

Thank you very much for your kind consideration and support.

Respectfully yours,

ALVIN A. BUTAY
Student
Email: alvinbutay15@gmail.com
Mobile: 0998 852 7459

Noted:

AGNES C. PEREY, PH. D.
Associate Professor V
Research Adviser

received by:
1/21/2026

Republic of the Philippines
PROVINCE OF AURORA
Baler
--ooOoo--
Office of the Provincial Agriculturist

Documents Routing Slip 2/16/2026

DRS No.: 2026-02-085 Date:
Origin: Talac Agricultural University

Refer to:	Instruction/ Directives	Signature
☑ FOD ☐ Planning ☐ Admin ☐ Fisheries Rice Program MVBZarra	☐ For Appropriate Action ☑ For your information ☐ For review/comments ☐ Please evaluate & recommend ☑ For dissemination ☐ For file/reference ☐ For schedule ☐ Please attend/ send representatives ☐ Please represent the office ☑ As stated ☐ Other/s	02/16/2026

Remarks: PREPARE LETTER OF ENDORSEMENT TO MAO-UA-AU

THX

OFFICE OF THE PROVINCIAL AGRICULT...
PROVINCE OF AURORA
RECEIVED
Name:
Date: 2/16/2026

...rmission and assistance to conduct farmer interviews ...P Rice Compliant in connection with my study ...**al Practices (GAP) and Their Role in Rural ...ssment."**

...on of Good Agricultural Practices among farmers and ...lopment in the region. The results of this research may ...tension services, and policy formulation.

...kind endorsement to allow me to coordinate with the ...r respondents. The interviews will be conducted ...nfidentiality of their responses. Below is the data of ...artment of Agriculture- Bureau of Plant Industry (BPI) and Regional Field Office ...:

Province	Population Size	Sample Size	Municipalities
Aurora	1	1	Maria Aurora

I am willing to comply with any requirements your office may set and to share the findings of the study with your office upon completion.

Thank you very much for your kind consideration and support.

Respectfully yours,

ALVIN A. BUTAY
Student
Email: alvinbutay15@gmail.com
Mobile: 0998 852 7459

Noted:

AGNES O. PEREY, PH. D.
Associate Professor V
Research Adviser

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may1241

APPENDIX E

Communication Letters for the various Municipal Agriculture Offices

February 12, 2026

HON. RICARDO I. PADILLA
Municipal Mayor
Municipality of Bongabon, Nueva Ecija

Attention: **MS. JACKIELOU GALLARDE**
Municipal Agriculturist

Dear HONORABLE MAYOR PADILLA:

Good day.

I am respectfully writing to request permission from your good office, through the Municipal Agriculture Office, to conduct farmers' interviews in your municipality as part of my academic research entitled **"Adoption of Good Agricultural Practices (GAP) and Their Role in Rural Development in Central Luzon: An Assessment."**

This study aims to assess the level of adoption of Good Agricultural Practices (GAP) among farmers and to examine how such practices contribute to rural development in the region. The findings of this research are expected to provide valuable inputs for local agricultural planning, policy formulation, and program improvement, particularly in promoting sustainable and safe agricultural production.

In this regard, I humbly request the assistance of the Municipal Agriculture Office in coordinating with the farmer-respondents and also to identify venue to conduct the said interview . Please be assured that the study will strictly adhere to ethical research standards, and that all information gathered will be treated with utmost confidentiality and used solely for academic purposes.

I am hopeful for the support and approval of your esteemed office. Your cooperation will greatly contribute to the successful completion of this study and to the generation of information that may be beneficial to the local agricultural sector.

Thank you very much for your time and kind consideration.

Respectfully yours,

ALVIN A. BUTAY
Student
Email: alvinbutay15@gmail.com
Mobile: 0998 852 7459

Noted:

AGNES C. PEREY, PH. D.
Associate Professor V
Research Adviser

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may1241

January 23, 2026

HON. MAY B. ECLAR
Municipal Mayor
Municipality of Gerona

Attention: **MS. REVILYN T. YADYADOC**
Municipal Agriculturist

Dear HONORABLE MAYOR ECLAR:

Good day.

I am respectfully writing to request permission from your good office, through the Municipal Agriculture Office, to conduct farmers' interviews in your municipality as part of my academic research entitled **"Adoption of Good Agricultural Practices (GAP) and Their Role in Rural Development in Central Luzon: An Assessment."**

This study aims to assess the level of adoption of Good Agricultural Practices (GAP) among farmers and to examine how such practices contribute to rural development in the region. The findings of this research are expected to provide valuable inputs for local agricultural planning, policy formulation, and program improvement, particularly in promoting sustainable and safe agricultural production.

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I am hopeful for the support and approval of your esteemed office. Your cooperation will greatly contribute to the successful completion of this study and to the generation of information that may be beneficial to the local agricultural sector.

Thank you very much for your time and kind consideration.

Respectfully yours,

ALVIN A. BUTAY
Student
Email: alvinbutay15@gmail.com
Mobile: 0998 852 7459

Noted:

AGNES C. PEREY, PH. D.
Associate Professor V
Research Adviser

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may1241

February 12, 2026

HON. JOSEL F. VIOLAGO
City Mayor
City of San Jose, Nueva Ecija

Attention: **MR. WILFREDO ALFONSO**
Acting City Agriculturist

Dear HONORABLE MAYOR VIOLAGO:

Good day.

I am respectfully writing to request permission from your good office, through the Municipal Agriculture Office, to conduct farmers' interviews in your municipality as part of my academic research entitled **"Adoption of Good Agricultural Practices (GAP) and Their Role in Rural Development in Central Luzon: An Assessment."**

This study aims to assess the level of adoption of Good Agricultural Practices (GAP) among farmers and to examine how such practices contribute to rural development in the region. The findings of this research are expected to provide valuable inputs for local agricultural planning, policy formulation, and program improvement, particularly in promoting sustainable and safe agricultural production.

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I am hopeful for the support and approval of your esteemed office. Your cooperation will greatly contribute to the successful completion of this study and to the generation of information that may be beneficial to the local agricultural sector.

Thank you very much for your time and kind consideration.

Respectfully yours,

ALVIN A. BUTAY
Student
Email: alvinbutay15@gmail.com
Mobile: 0998 852 7459

Noted:

AGNES C. PEREY, PH. D.
Associate Professor V
Research Adviser

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may1241

February 11, 2026

HON. GLENDA P. ROMANO
Municipal Mayor
Municipality of Lupao, Nueva Ecija

Attention: **MS. JOHANNA S. MARIANO**
Municipal Agriculturist

Dear HONORABLE MAYOR ROMANO:

Good day.

I am respectfully writing to request permission from your good office, through the Municipal Agriculture Office, to conduct farmers' interviews in your municipality as part of my academic research entitled **"Adoption of Good Agricultural Practices (GAP) and Their Role in Rural Development in Central Luzon: An Assessment."**

This study aims to assess the level of adoption of Good Agricultural Practices (GAP) among farmers and to examine how such practices contribute to rural development in the region. The findings of this research are expected to provide valuable inputs for local agricultural planning, policy formulation, and program improvement, particularly in promoting sustainable and safe agricultural production.

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I am hopeful for the support and approval of your esteemed office. Your cooperation will greatly contribute to the successful completion of this study and to the generation of information that may be beneficial to the local agricultural sector.

Thank you very much for your time and kind consideration.

Respectfully yours,

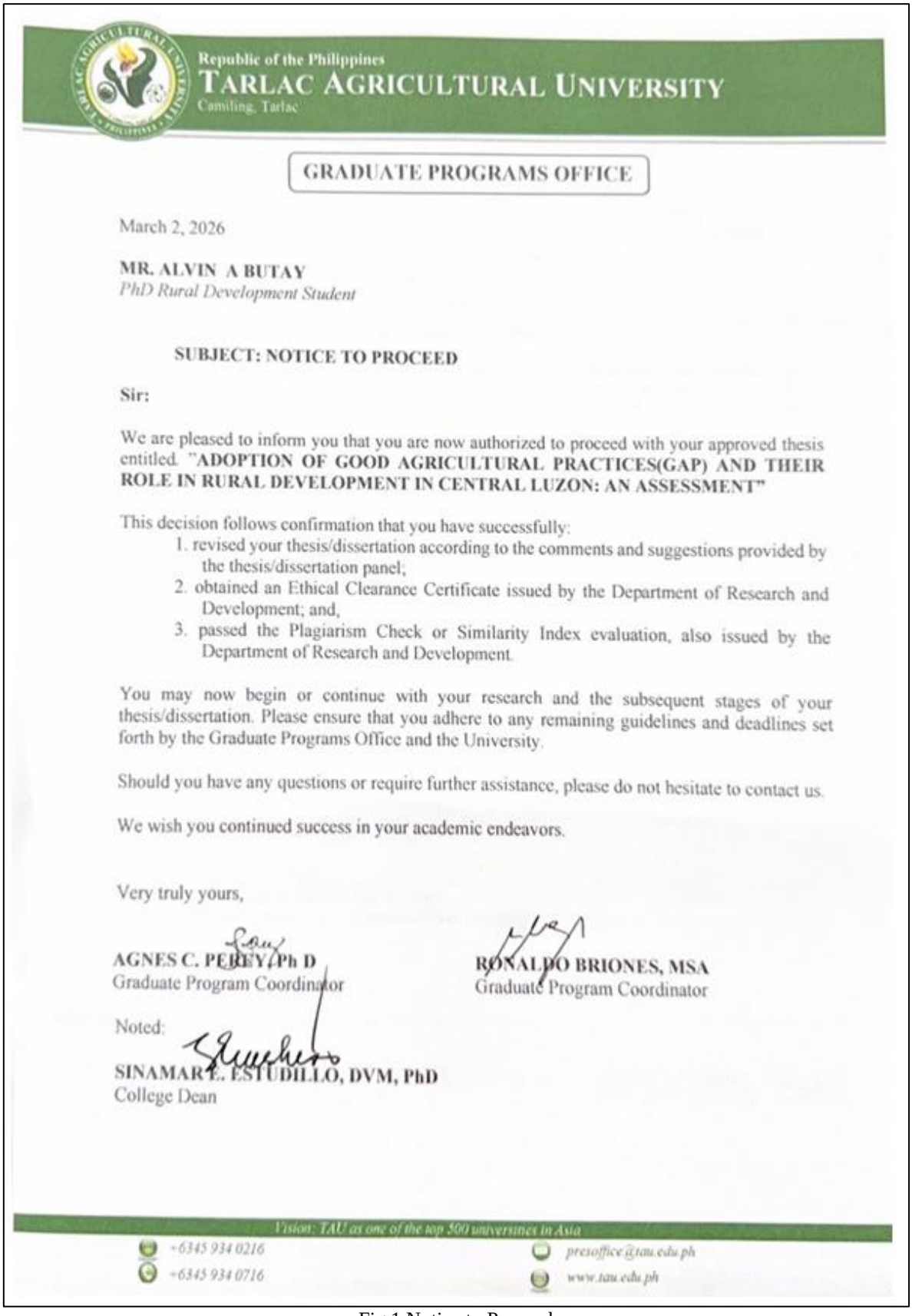
ALVIN A. BUTAY
Student
Email: alvinbutay15@gmail.com
Mobile: 0998 852 7459

Noted:

AGNES C. PEREY, PH. D.
Associate Professor V
Research Adviser

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may1241

APPENDIX F. DEPARTMENT OF RESEARCH AND DEVELOPMENT CERTIFICATIONS



Republic of the Philippines
TARLAC AGRICULTURAL UNIVERSITY
Camiling, Tarlac

GRADUATE PROGRAMS OFFICE

March 2, 2026

MR. ALVIN A BUTAY
PhD Rural Development Student

SUBJECT: NOTICE TO PROCEED

Sir:

We are pleased to inform you that you are now authorized to proceed with your approved thesis entitled. **"ADOPTION OF GOOD AGRICULTURAL PRACTICES(GAP) AND THEIR ROLE IN RURAL DEVELOPMENT IN CENTRAL LUZON: AN ASSESSMENT"**

This decision follows confirmation that you have successfully:

1. revised your thesis/dissertation according to the comments and suggestions provided by the thesis/dissertation panel;
2. obtained an Ethical Clearance Certificate issued by the Department of Research and Development; and,
3. passed the Plagiarism Check or Similarity Index evaluation, also issued by the Department of Research and Development.

You may now begin or continue with your research and the subsequent stages of your thesis/dissertation. Please ensure that you adhere to any remaining guidelines and deadlines set forth by the Graduate Programs Office and the University.

Should you have any questions or require further assistance, please do not hesitate to contact us.

We wish you continued success in your academic endeavors.

Very truly yours,

AGNES C. PEREY, Ph D
Graduate Program Coordinator

RONALDO BRIONES, MSA
Graduate Program Coordinator

Noted:

SINAMARE. ESTUDILLO, DVM, PhD
College Dean

Vision: TAU as one of the top 500 universities in Asia
+6345 934 0216 presoffice@tau.edu.ph
+6345 934 0716 www.tau.edu.ph

Fig 1 Notice to Proceed

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may1241

3708

TARLAC AGRICULTURAL UNIVERSITY

RESEARCH ETHICS OFFICE
DEPARTMENT OF RESEARCH AND DEVELOPMENT

CERTIFICATE OF EXEMPTION

Certificate Reference Number	:	EX-0106
Project/Study Title	:	Adoption of Good Agricultural Practices (GAP) and Their Role in Rural Development in Central Luzon: An Assessment
Nature of Project/Study	:	Human Subject Use
Principal Researcher	:	Alvin A. Butay
Adviser	:	Dr. Agnes C. Perey

This is to declare that the research undertaking mentioned above has been reviewed by the University Research Ethics Committee (UREC) and has been determined to meet the criteria for Exemption from ethical review, in accordance to research ethical guidelines and principles. The researcher may therefore commence with the research from the date this certificate is issued.

However, for any change in the instruments to be used, a separate authorization will be required. Any material change in the conditions declared as well as breaches in the ethical undertakings or events should be reported to the REO immediately.

The REO reserves the right to withdraw this exemption if the research deviates from the approved methods and protocols; poses unforeseen risks or harms to participants, subjects, or the environment; and fails to comply with university policies or ethical guidelines. The exemption will be null and void from the date of withdrawal.

This certificate is issued as prerequisite to commence the said research. Given and attested this 2nd day of December 2025 at the Tarlac Agricultural University, Camiling, Tarlac.

ENGR. CHELSIE C. PAGATPATAN
Manager, Research Ethics Office
12/02/2025
Date Signed

for
MARIA ELENA T. CAGUIOA, Ph.D.
Director, Research and Development
12/02/2025
Date Signed

EDMAR N. FRANQUERA, Ph.D.
Vice President, Research, Extension and Training
12/3/25
Date Signed

Research Ethics Office, Department of Research and Development
Tarlac Agricultural University, Malacampa, Camiling, Tarlac 2306 Philippines
Tel.No.: (045) 934 0216 loc 117 | Fax: (045) 934 0716
Email: tau_ureo@tau.edu.ph

Form Code	Revision No.	Effectivity Date	Page
TAU-REO-QF-05	00	February 18, 2025	1 of 1

Fig 2 University Research Ethics Committee (UREC) Certificate

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may1241

Republic of the Philippines
TARLAC AGRICULTURAL UNIVERSITY
Camiling, Tarlac

80 YEARS

DEPARTMENT OF RESEARCH AND DEVELOPMENT

SIMILARITY INDEX CERTIFICATE

BASIC INFORMATION OF THE RESEARCH	
Research Title:	ADOPTION OF GOOD AGRICULTURAL PRACTICES (GAP) AND THEIR ROLE IN RURAL DEVELOPMENT IN CENTRAL LUZON: AN ASSESSMENT
Researcher(s):	Butay, Alvin A.
Type of Research:	☒Social ☐Technical
Proposed Budget:	N/A
Date Started:	JANUARY 2026
Date Completed:	APRIL 2026
Anti-Plagiarism Software Used:	Turnitin

CERTIFICATION

This is to certify that the research of Mr./ Ms. ALVIN A. BUTAY *is within/ not within the acceptable percentage of the anti-plagiarism software with unoriginal rating of 7%. Attached herewith is the proof of authenticity.*

Date signed: 06 MAY 2026

NOEL B. PETERO, Ph. D.
DRD Director
(Signature over Printed Name)

RECEIVED

Date signed: MAY 6, 2026

ALVIN A. BUTAY
Requestor
(Signature Over Printed Name)

Date of Released: May 06, 2026	*Certificate of Authenticity No: PLA-1541*	*Document No:* RAO-2026-1129

Legend:
0-20% - acceptable
21% and above – not acceptable

Form Code:	*Revision No.:*	*Effectivity Date:*	*Page:*
TAU-DRD-QF-40	02	February 27, 2026	1 of 1

Fig 3 Similarity Index Certification

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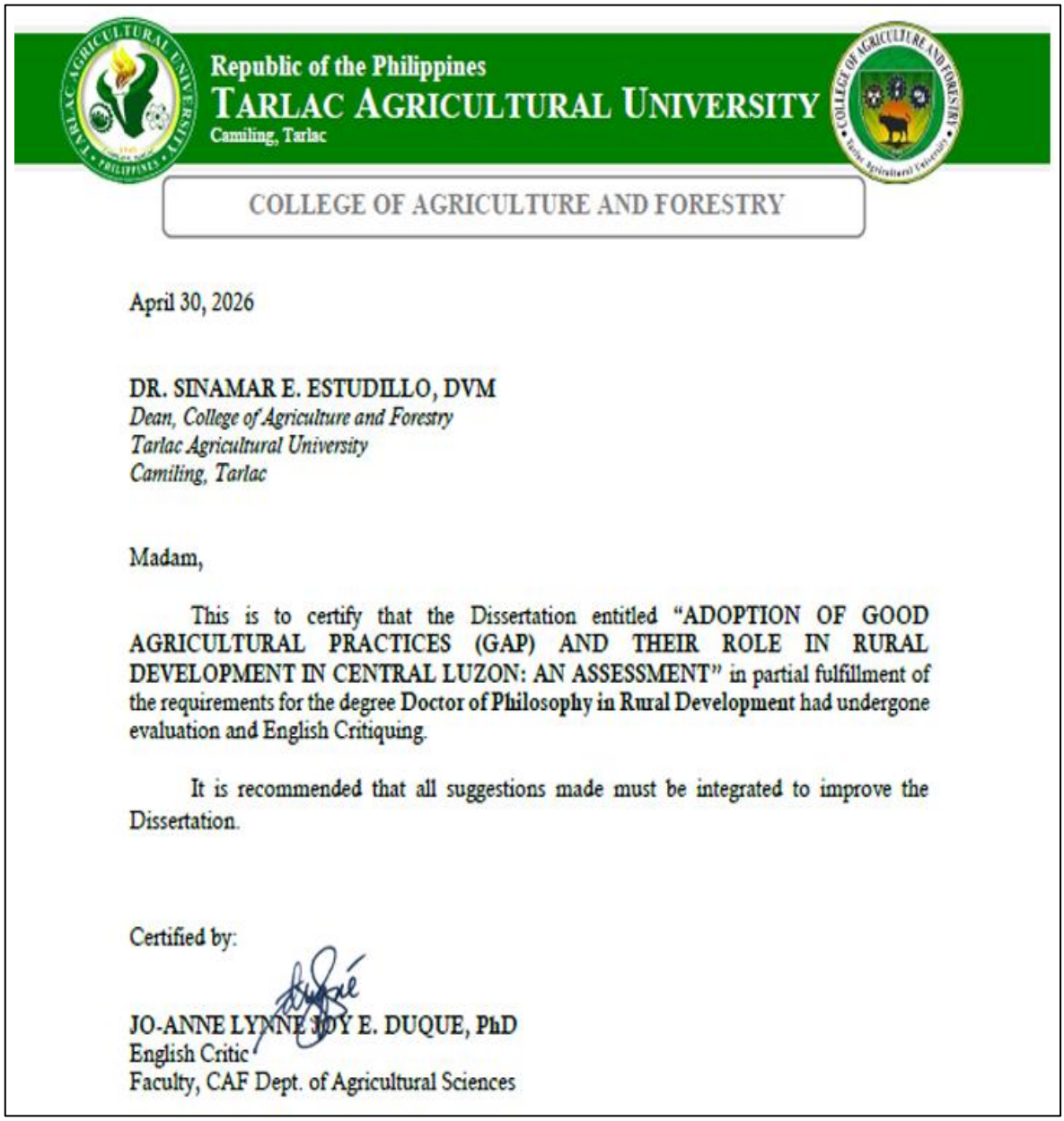

Republic of the Philippines
TARLAC AGRICULTURAL UNIVERSITY
Camiling, Tarlac

COLLEGE OF AGRICULTURE AND FORESTRY

April 30, 2026

DR. SINAMAR E. ESTUDILLO, DVM
Dean, College of Agriculture and Forestry
Tarlac Agricultural University
Camiling, Tarlac

Madam,

This is to certify that the Dissertation entitled "ADOPTION OF GOOD AGRICULTURAL PRACTICES (GAP) AND THEIR ROLE IN RURAL DEVELOPMENT IN CENTRAL LUZON: AN ASSESSMENT" in partial fulfillment of the requirements for the degree Doctor of Philosophy in Rural Development had undergone evaluation and English Critiquing.

It is recommended that all suggestions made must be integrated to improve the Dissertation.

Certified by:

JO-ANNE LYNNE JOY E. DUQUE, PhD
English Critic
Faculty, CAF Dept. of Agricultural Sciences

Fig 4 English Critique Certification

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APPENDIX G
APPENDIX PICTURES

Photo Documentations of the Research

Fig 5 The Researcher and the Members of the Dissertation Panel during the Research Proposal Defense on October 2, 2025, at the Graduate Studies Conference Room

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Fig 6 Consultation with the Research Adviser, Dr. Agnes C. Perey, Regarding the Schedule of Face-to-Face Interviews with Farmer Respondents

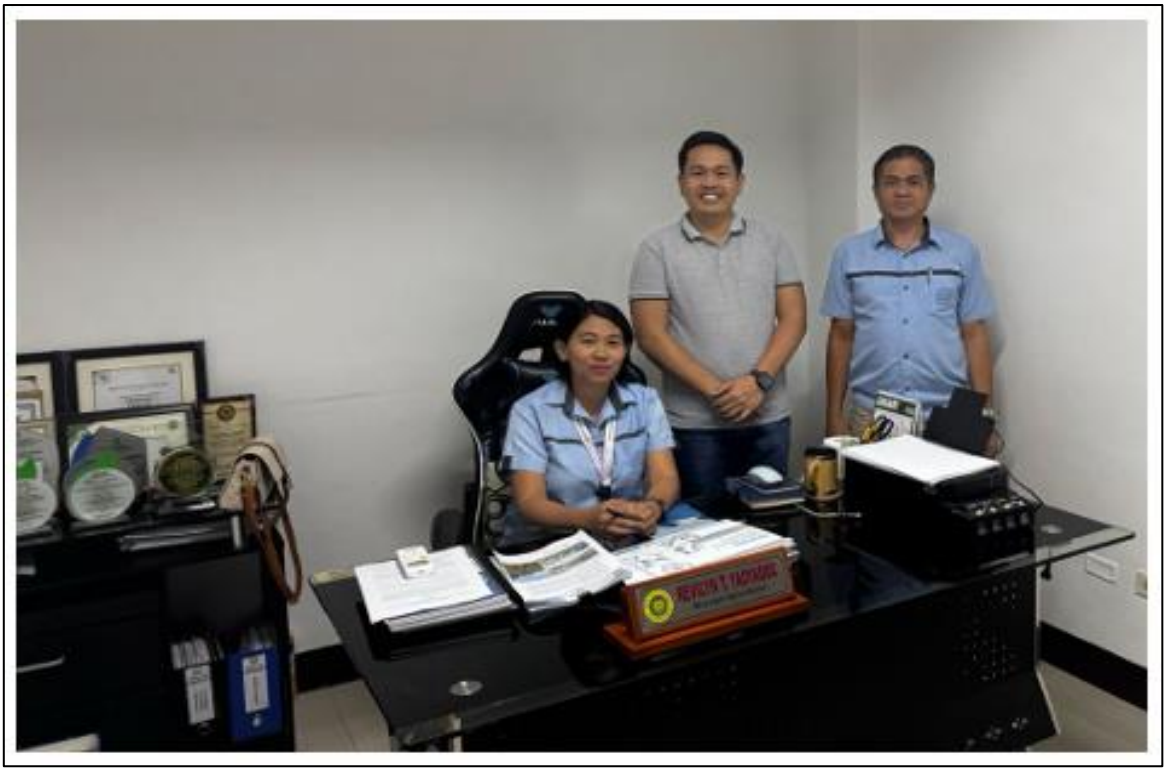

Fig 7 Courtesy visit to Ms. Revilyn Yadyadoc, Municipal Agriculturist and her Staff at Gerona Municipal Agriculture Office

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Fig 8 Members of Sembrano Agriculture Cooperative of Gerona, Tarlac During the Farmers' Interview

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Fig 9 Courtesy Visit to Mr. Arturo Narciso, Municipal Agriculturist of Sta Ignacia, Tarlac and the Actual Farmers Interview at Macaguing Agriculture Cooperative

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Fig 10 Courtesy Visit to Mr. Erickson Bao, Municipal Agriculturist of Zaragoza, Nueva Ecija and the Agriculture Staff of San Jose City headed by Mr. Wilfredo Alfonso, OIC City Agriculturist

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Fig 17 The Researcher and the Members of the Examining Committee During the Final Dissertation Defense on April 15, 2026, at Farmers' Training Center (FTC) Conference Room