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Hernandez, Rebecca S.[1]
Espino, Paul Adrian C.[2]

Corresponding Author: *rebeccasantos88hernandez@gmail.com*

[1–2]*Bulacan Agricultural State College, Pinaod, San Ildefonso, Bulacan, Philippines*

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The Delivery of *Sistemang PalayCheck* Among Farmers in the City of Malolos: Introduce the Modern Technology in Farming

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Hernandez, Rebecca S.[1]
Espino, Paul Adrian C.[2]

Corresponding Author: *rebeccasantos88hernandez@gmail.com*

[1–2]*Bulacan Agricultural State College, Pinaod, San Ildefonso, Bulacan, Philippines*

Abstract

Inflation in the Philippines has negatively affected agriculture by causing price fluctuations and challenging the adoption of technology. One program from the national government that refines rice production is the *Sistemang PalayCheck*. A communal technology-based program that empowers farmers to enhance their understanding and expertise in rice cultivation, fostering a shared learning environment. This study evaluates the impact of *Sistemang PalayCheck* among farmers in the City of Malolos, Bulacan, focusing on knowledge acquisition, skill improvement, and attitude enhancement. This study employed a purposive sampling technique, focusing on 100 farmers who were intentionally selected for their relevance to the research—particularly those with no prior knowledge of the *Sistemang PalayCheck* program. The instrument used is a 22-item Likert scale questionnaire designed to measure the delivery of *Sistemang PalayCheck* among the farmers. It covered three domains: knowledge, skill, and attitude. Findings revealed that farmers achieved high levels of knowledge (M = 3.90, SD = 0.31), skill (M = 3.90, SD = 0.36), and attitude (M = 3.83, SD = 0.36), indicating the program's effectiveness in enhancing farming practices. The implications suggest that community-based agricultural interventions can significantly contribute to food security and sustainable economic growth.

Keywords: *farmer, farming, knowledge, PalayCheck, programs, rice, technology*

Introduction

Inflation has persistently affected the agricultural sector globally, including in countries like India, Vietnam, and Thailand, where rice production has similarly faced challenges. In the Philippines, volatile agricultural prices have led to difficulties in adopting modern technology (Ocampo, 2018). Initial efforts centered on individualized technology interventions; however, smallholder farmers often lacked the resources to sustain them. Communal technology solutions, such as shared equipment and collective training, have emerged as a more sustainable approach. Additionally, recent studies show that some Filipino farmers lag behind in essential knowledge, skills, and attitudes needed for agriculture due to the absence of structured training programs (Cayabyab et al., 2024).

One such intervention is the *Sistemang PalayCheck*, a government-sponsored program aimed at refining rice cultivation practices. The program encourages farmers to improve practices ranging from seed selection to post-harvest storage. This study evaluates the delivery of *Sistemang PalayCheck* in Malolos City by assessing its influence on farmers' knowledge, skills, and attitudes.

Initially, efforts to address agricultural concerns in the Philippines primarily revolved around individualized technology solutions. These solutions aimed to enhance productivity and mitigate risks at the individual farmer level to support food security and economic stability. The need to address these concerns has led to various attempts, initially focusing on individualized technology solutions. However, the limitations of such approaches became evident (Briones, 2023). For instance, farmers were provided with access to improved seeds, fertilizers, and mechanized equipment. Additionally, training programs were implemented to educate farmers on modern agricultural practices and techniques (Garcia & Krishna, 2021).

While individualized technology solutions yielded some benefits, they faced inherent limitations. Smallholder farmers, who form a significant portion of the agricultural workforce in the Philippines, often lacked the resources and infrastructure to fully capitalize on these technologies (Briones, 2021). Moreover, the fragmented nature of individual efforts hindered broader systemic improvements in the sector.

Recognizing the inadequacies of individualized approaches, there has been a paradigm shift towards communal technology solutions in addressing agricultural concerns in the Philippines. Communal technology emphasizes collaborative efforts and resource-sharing among farmers within a community (Kliem, 2022). This approach promotes the pooling of resources, knowledge exchange, and collective decision-making to optimize agricultural practices.

Communal technology solutions encompass a range of interventions, including community seed banks, shared machinery, cooperative farming arrangements, and collaborative research and extension services (Okori et al., 2022). By leveraging the strengths of the community, these initiatives enable smallholder farmers to overcome resource constraints and enhance their resilience to external shocks, such as climate variability and market fluctuations.

In the Philippine context, the application of community-based technology in agriculture holds significant promise for advancing sustainability and resilience in the sector. Community-driven initiatives, such as farmer cooperatives and community-supported agriculture programs, have emerged as effective mechanisms for promoting inclusive growth and equitable development (Inutan et al., 2025). Thus, the *Sistemang PalayCheck* plays a crucial role as a community-centered technology solution. The basis of this program is group experiential learning, which actively encourages cooperation and knowledge-sharing among farmers, strengthening the sense of community-based learning and group development.

PalayCheck is a national government project implemented through local government units to initiate a Farmer's Field School (FFS) that trains and equips local farmers with modern agricultural technologies to achieve sustainable agricultural production.

In addition, the *Sistemang PalayCheck* includes a set of indicators that serve as practical benchmarks to help farmers manage rice production more effectively. Since these indicators were originally written in Filipino, this study translated them to ensure clarity, accessibility, and relevance for a wider academic and research audience. These indicators are:

1. *pagpili ng barayti at binhi sa pagtatanim.* (choosing varieties and seeds in farming)
2. *maayos na pagpapatag ng lupa* (proper land leveling),
3. *sabayang pagtatanim matapos pagpahingahin ang lupa*, (synchronous planting after allowing the soil to rest),
4. *pagkakaroon ng malulusog na punla* (having healthy seedlings),
5. *bigyan ng sapat na sustansiya ang pananim na palay bago magbuntis hanggang bago anihin* (maintaining adequate nutrients during tillering, panicle initiation, and flowering stages),
6. *pamamahala ng tamang dami ng tubig* (proper water management),
7. *pamamahala ng peste upang maiwasan ang pagbaba ng ani* (pest management to prevent yield

loss),
8. *pag-ani ng palay sa tamang panahon* (harvesting rice at the right time), and
9. *tamang paraan ng pagsisinop ng ani* (proper post-harvest handling and storage).

The enumerated key indicators allow the *Sistemang PalayCheck* to assist Filipino Farmers from the initial stages of farming (choosing the proper variety of seedlings) to the later stages of farming (proper storage of yields), especially *palay.*

Generally speaking, the *Sistemang PalayCheck* aims to integrate the advanced technology into present agricultural and farming practices. As such, it encourages farmers to compare their current farming methods with recommended innovative techniques. The *Sistemang PalayCheck* is communitarian in essence, as it seeks to provide an avenue for farmers and representatives from the agricultural sector (Philippine Rice Research Institute & Department of Agriculture, 2022). However, just like any program, its implementation at the grassroots level must be assessed.

Moreover, government policies and programs have increasingly recognized the importance of supporting community-based approaches to agricultural development. By fostering partnerships between government agencies, research institutions, civil society organizations, and local communities, policymakers aim to create an enabling environment for the adoption and scaling up of communal technology solutions (Department of Agriculture, 2023). Thus, the study aimed to assess the delivery of *Sistemang PalayCheck* among selected farmers in the City of Malolos. By harnessing the collective wisdom and resources of communities, communal technology offers a pathway towards sustainable agricultural development, poverty alleviation, and food security. Moving forward, it is imperative to continue supporting and scaling up community-based initiatives to realize the full potential of agricultural innovation in the Philippines.

Sistemang PalayCheck also gives helpful insight in the mid-process of farming such as proper flattening of the soil and allowing the soil to rest to preserve its nutrients. These insights have become helpful in improving and augmenting present farming practices. However, technology—which is ever-changing and dynamic—still needs to be continuously integrated.

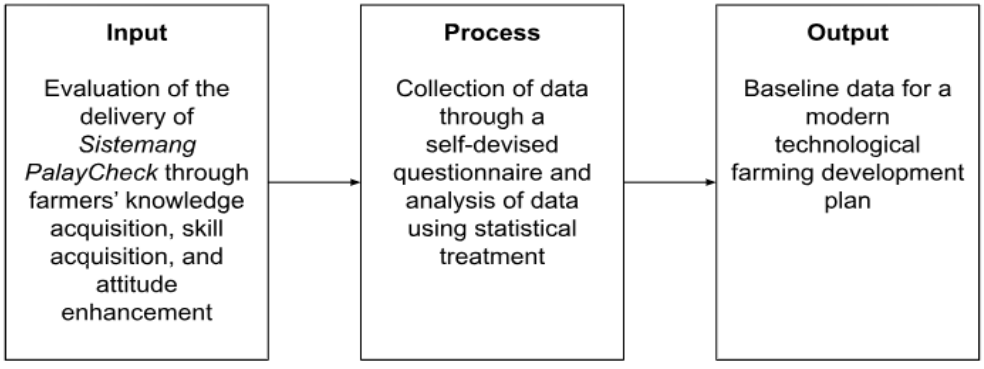
Materials and Methods

Theoretical Framework

The Input-Process-Output (IPO) theoretical framework was employed to examine the evaluation of the delivery of *Sistemang PalayCheck* (input) through farmer's knowledge, skills, and attitude acquisition (process). For the output, the study aims to generate findings that serve as baseline data for developing a modern technological farming plan.

Figure 1

Theoretical Framework of the Study



Type of Research

The researchers utilized a descriptive evaluative design in the conduct of the study. The said research design involves the systematic collection and analysis of data to describe and assess the current state or condition of a specific phenomenon, process, or program (Fraenkel & Wallen, 2007). Furthermore, it aims to provide a comprehensive overview of the subject of interest, enabling researchers to evaluate its effectiveness, strengths, weaknesses, and areas for improvement based on empirical evidence. This study is descriptive evaluative in nature as it assesses the delivery of *Sistemang PalayCheck* among farmers in the City of Malolos, Bulacan, identified through purposive sampling.

Respondents

The respondents of the study were composed of 100 farmers from the City of Malolos, Bulacan and were identified using purposive sampling. Purposive sampling is a type of non-probability sampling in which the participants are chosen based on specific characteristics and criteria that are directly relevant to the research (Nikolopoulou, 2022). The reason for using purposive sampling was to deliberately select farmer who actively adopted the *Sistemang PalayCheck* system, as verified by local agricultural office records. In this non-probability sampling procedure, the researcher intentionally selects participants who can provide additional information on the phenomenon under investigation (Patton, 2002, as cited in Etikan et al., 2016). Furthermore, the study focused on farmers who adopted the *Sistemang PalayCheck* on their farming practices.

Instrument of the Study

The researchers developed a self-devised instrument consisting of 22 items scored using a four-point Likert-scale (ranging from “strongly agree” to “strongly disagree”) to measure the delivery of *Sistemang PalayCheck* among the farmers in the City of Malolos, Bulacan. The items are grouped into three domains: knowledge acquisition, skill acquisition, and attitude enhancement. Furthermore, the instrument was subjected to content validation with professionals from relevant disciplines, including a PalayCheck trainer from TESDA and LGU’s. It was revised based on their comments and suggestions to further improve its content. A self-devised 22-item questionnaire was developed and validated by experts, achieving a Content Validity Index (CVI) of 1.00. The CVI was used to ensure that the research instrument measured what it was intended to measure, with experts evaluating each item for its relevance and appropriateness to the study, while Cronbach’s Alpha was calculated to assess the internal consistency of the instrument (Ain et al., 2025). A pilot test was conducted with 20 non-respondent farmers, yielding a Cronbach's Alpha of 0.92, indicating high reliability.

Data Collection Procedure

The researchers administered the self-devised questionnaires to the respondents of the study. Furthermore, the researchers adhered to the ethical guidelines in research by obtaining informed consent from the selected farmers before data collection. The consent form detailed the study’s purpose, data collection methods, and the associated risks and benefits of the study. In addition, the researcher used pseudonyms during the presentation of results to ensure the confidentiality of every participant. The obtained responses were stored only for the project’s duration and solely used for academic purposes.

Data Analysis

To clearly understand and interpret the information gathered in this study, we used the following statistical tools to present and analyze the data.

a. **Mean**. To explain the knowledge acquisition, skill acquisition, and attitude enhancement of the respondents through the delivery of *Sistemang PalayCheck*. Furthermore, the mean was interpreted using the following intervals:

Table 1

Interpretation of Knowledge, Skills, and Attitude Acquisition

Scale	Option	Mean Range	Interpretation
4	Strongly Agree	3.25 – 4.00	High Acquisition
3	Agree	2.50 – 3.24	Moderate Acquisition
2	Disagree	1.75 – 2.49	Low Acquisition
1	Strongly Disagree	1.00 – 1.74	No Acquisition

b. **Standard deviation.** To describe the dispersion of the data set. A low standard deviation indicates that the values lie close to the mean, while a high standard deviation suggests that the values are more spread out, indicating a more significant variation within the responses.

Results and Discussion

In this section, we present the results and discuss the implications of our study on the delivery of *Sistemang PalayCheck* among farmers in the City of Malolos, Bulacan. Based on the perceptions of farmers, and through rigorous data collection and analysis methods, we aimed to measure the said implementation through knowledge acquisition, skill acquisition, and attitude enhancement. Farmers were pre-selected based on their willingness and readiness to participate, with priority given to new farmers who had not previously received formal training. Additionally, the *PalayCheck* program provided hands-on training that enabled participants to directly apply the acquired information and skills to their respective farm lots. The findings may also serve as a point of reference in relation to previous harvest records, as harvest reports have been consistently gathered every season through the ROI.

Table 2

Farmers' Knowledge Acquisition through Sistemang PalayCheck

Through ***Sistemang PalayCheck***, I hand a comprehensive understanding about…	Mean	SD	Interpretation
1. Choosing variety and seedlings in farming.	3.88	0.33	High Acquisition
2. Proper flattening of the soil.	3.90	0.49	High Acquisition
3. Simultaneous planting after allowing the soil to 'rest'.	3.80	0.33	High Acquisition
4. Having nutrient field soil.	3.94	0.24	High Acquisition
5. Maintaining enough nutrients in different stages of planting.	3.88	0.33	High Acquisition
6. Managing enough water content.	3.94	0.24	High Acquisition
7. Managing pest so as not to affect the yield.	3.92	0.28	High Acquisition
8. Harvesting *palay* at the proper season.	3.96	0.20	High Acquisition
9. Proper storage of the yield.	3.90	0.39	High Acquisition
Overall Knowledge Acquisition	**3.90**	**0.31**	**High Acquisition**

Table 2 shows that farmers demonstrated a high knowledge acquisition on farming through *Sistemang PalayCheck*, with harvesting *palay* at the proper season, managing enough water content, and having a nutrient filled soil as key areas with the highest mean. The findings suggest that farmers are well-informed about (1) seasonal variations and the impact on crop maturity, (2) the need for proper irrigation practices to optimize crop production, and (3) soil nutrition requirements, including the importance of organic matter, micronutrients, and soil pH balance, to ensure optimal crop growth and yield.

Farmers demonstrated a high level of knowledge acquisition (M = 3.90, SD = 0.31), particularly in practices like proper water management and optimal harvesting periods. The computed standard deviation indicated that the farmers' responses were generally consistent with one another. This perception-based finding suggests that farmers were well-informed about critical farming practices, which could potentially improve their productivity. This result also corroborates the findings of Red et. al. (2021),

which indicates that farmers who underwent *Sistemang PalayCheck* demonstrated a higher knowledge acquisition (M = 4.03), compared to those who did not (M = 3.47).

Table 3

Farmers' Skills Acquisition Through Sistemang PalayCheck

	Through *Sistemang PalayCheck*, I improved my current practices in…	**Mean**	**SD**	**Interpretation**
1.	Choosing variety and seedlings in farming.	3.90	0.49	High Acquisition
2.	Proper flattening of the soil.	3.88	0.33	High Acquisition
3.	Simultaneous planting after allowing the soil to 'rest'.	3.80	0.78	High Acquisition
4.	Having nutrient field soil.	3.94	0.24	High Acquisition
5.	Maintaining enough nutrients in different stages of planting.	3.88	0.33	High Acquisition
6.	Managing enough water content.	3.94	0.24	High Acquisition
7.	Managing pest so as not to affect the yield.	3.92	0.28	High Acquisition
8.	Harvesting *palay* at the proper season.	3.96	0.20	High Acquisition
9.	Proper storage of the yield.	3.88	0.33	High Acquisition
	Overall Skill Acquisition	**3.90**	**0.36**	**High Acquisition**

Table 3 shows that farmers demonstrated a high skill acquisition on farming through *Sistemang PalayCheck*, with harvesting *palay* at the proper season, managing enough water content, and having a nutrient filled soil as key areas with the highest mean. The findings suggest that farmers (1) were adept at timing their harvests appropriately, potentially leading to improved productivity and marketability of their produce; (2) had the ability to effectively regulate water usage, optimizing crop growth and mitigating risks associated with water scarcity or excess; and (3) were proficient in managing soil nutrients, possibly through practices such as proper fertilization and soil amendments, leading to healthier crops and increased yields.

High skill acquisition was also reported (M = 3.90, SD = 0.36). The computed standard deviation showed that the farmers' responses had very little variation, meaning most of their answers were closely aligned with the average. Farmers indicated improved skills in soil preparation, pest management, and nutrient application. On Red et al. (2021) studies show the same improving results with (M = 4.05) skill acquisition compared to farmers who don't go under *Sistemang PalayCheck* with (M = 3.27) skill acquisition.

Table 4

Farmers' Attitude Enhancement Through Sistemang PalayCheck

	I believe that…	**Mean**	**SD**	**Interpretation**
1.	Modern farming techniques are essential for the future of agriculture.	3.60	0.49	High Acquisition
2.	Technology aligned with modern agriculture influence me to have an optimistic perspective regarding the integration of technology and modern-day agricultural techniques.	3.90	0.49	High Acquisition
3.	The integration of technology and agriculture inspire me to research on modern farming techniques.	3.88	0.33	High Acquisition
4.	Modern farming approaches can contribute to increased productivity and sustainability.	3.96	0.20	High Acquisition
	Overall Attitude Acquisition	**3.83**	**0.36**	**High Acquisition**

Table 4 shows that farmers demonstrated a high attitude enhancement on farming through *Sistemang PalayCheck*. Notably, the belief regarding the contribution of modern farming approaches to increased productivity and sustainability received the highest mean score. This finding underscores the importance of integrating modern farming approaches, as advocated by *Sistemang PalayCheck*, into

traditional farming practices. The high level of agreement among farmers indicates a strong recognition of the potential benefits associated with adopting innovative methods and technologies in agriculture. It suggests a positive shift in attitudes towards embracing advancements in farming practices to address challenges such as increasing demand for food production, resource constraints, and environmental sustainability.

Farmers exhibited a highly positive attitude towards adopting modern agricultural techniques (M = 3.83, SD = 0.36). The computed standard deviation suggests that most of the farmers' responses were close to overall average. They recognized the role of technology in enhancing productivity and sustainability. The attitude of farmers is also highly positive in the research study of Red et al. (2021), whereas it exhibits a mean of 5.01 (M = 5.01) compared to the farmers who did not experience the *Sistemang Palaycheck*.

Conclusion

The findings collectively highlight the effectiveness of *Sistemang PalayCheck* in enhancing Filipino farmers' knowledge, skills, and attitudes towards farming practices. By equipping farmers with the necessary knowledge, skills, and mindset, *Sistemang PalayCheck* has the potential to contribute significantly to the advancement of sustainable agriculture and the livelihoods of farming communities in the Philippines.

Recommendations

This study focused on three indicators encompassing the entire *Sistemang PalayCheck* namely (1) knowledge acquisition, (2) skill acquisition, and (3) attitude enhancement. It is limited to these three main indicators; hence, it is recommended to explore equally important factors such as the belief and interests, which can strongly influence receptivity towards modern technological advancement in agriculture. For example, there is a tendency to equate modern technology with complex procedures.

The study also recommends a deeper integration of experiential and quantitative data by including yield comparisons before and after *PalayCheck* adoption. Further, it proposes the development of a "Modern Technological Farming Development Plan" that integrates continuous farmer training programs, monitoring and evaluation tools, and community-led research initiatives.

Another recommendation that this study propounds is to add qualitative questions so as to expose or reveal the lived experience of the selected Maloleno farmers. Further, it is suggested that a longitudinal study be conducted given the complexity of behavioral change and skill development. Hence, follow-up assessments at regular intervals can provide insights into the sustainability of the program's effects and identify areas for continuous improvement.

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