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Implementation of Field School Activities for Agricultural Technology Innovation in Klirong District, Kebumen Regency

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KEYWORDS

Agricultural Technology Innovation, Field School, Post-Harvest Management, Farmer Education, Rice Production

ABSTRACT

This research aims to analyze the implementation of Agricultural Technology Innovation Field School (SLPITP) activities in Klirong District, Kebumen Regency, focusing on post-harvest and harvest management training for farmers. The study addresses the need to improve farmers' knowledge and skills in implementing agricultural technology innovations to increase productivity and reduce post-harvest losses. The research employs a qualitative descriptive method using in-depth interviews, observations, and focus group discussions with 21 informants consisting of farmer group leaders, agricultural extension workers, village officials, and government staff from district and provincial agricultural offices. Data collection was conducted from November 2024 to March 2025 through purposive sampling technique. The results indicate that the SLPITP program successfully provided farmers with practical knowledge in six key areas: technology innovation socialization, power thresher operation, harvest loss calculation, special rice cultivation, vacuum packaging techniques, and follow-up action planning. The program involved 50 farmers from 10 farmer groups across three villages and provided essential equipment including power threshers, tarpaulins, moisture measuring tools, and vacuum packaging machines. Key challenges identified include limited initial farmer knowledge, low learning interest, capital constraints for post-harvest equipment, and the "ijon" purchasing system that discourages quality improvements. Despite these obstacles, the program achieved positive outcomes through hands-on learning approaches and provision of practical tools. The implications of this study suggest that field school programs effectively enhance farmer capabilities when supported by appropriate infrastructure and continuous follow-up activities. Future research should focus on long-term impact assessment and scaling strategies for broader implementation across different agricultural contexts.

INTRODUCTION

Indonesia is predominantly agrarian, with a large proportion of its population engaged in rice cultivation, yet the sector faces mounting challenges (Tualle et al., 2023). Rapid conversion of fertile paddy fields for non-agricultural uses—amounting to a loss of approximately 1.22 million hectares between 1990 and 2022—continues to threaten production potential (Gandharum et al., 2025). Moreover, Indonesia’s rice yield remains highly vulnerable

to climate anomalies; both El Niño and La Niña events negatively influence production, with temperature extremes and erratic rainfall patterns further exacerbating yield instability (ResearchGate, 2020; Barrios-Perez, 2021). Climate change compounds these risks, as elevated temperatures, shifting rainfall regimes, prolonged droughts, floods, and soil degradation increasingly hinder paddy productivity (Ansari, 2023; Liesdiana et al., 2018). Soil sickness—marked by nutrient depletion, salinity, and poor drainage—adds another layer of vulnerability in irrigated rice systems (Rachman et al., 2022). Declining harvested areas, as observed in key agricultural provinces such as Central Java, underscore the urgency of these threats, with reductions attributed to land conversion, climate stress, and aging agricultural infrastructure (Central Java study, 2025). The convergence of these drivers not only directly reduces rice yields but also contributes to price volatility, undermining the agricultural sector's capacity to fulfill the nation's staple food demand.

Central Java Province was awarded as the region with the highest rice production in Indonesia in 2019, with a rice production of 9,655,653 tons of dry unhusked rice (*GKG*), equivalent to 5,539,448 tons of rice from paddy fields (https://jatengprov.go.id). Generally, the land utilization in Central Java includes 990,824.00 hectares of rice fields, accounting for 30.45%, and 2,263,588.00 hectares of non-rice land, accounting for 69.55%. The largest land use is technical irrigation rice fields, covering 386,033.00 hectares spread across 35 districts. The agroecosystem of technical irrigation rice fields has high potential for increasing agricultural productivity and farmers' income.

Kebumen Regency is one of the food-producing regions in Central Java, with the highest rice production in 2023, reaching 403,757 tons of rice and 232,184 tons of milled rice (BPS Kebumen, 2019). One of the subdistricts in Kebumen is Klirong, a large agricultural area where most of the population works as farmers. Farmers in Klirong predominantly grow rice, corn, green beans, and horticultural crops, and raise cattle. Klirong consists of 24 villages, with a mix of lowland and coastal areas. The area has 1,353 hectares of irrigated rice fields and is home to 12,729 farming families. Generally, 57.2% of land is used for rice farming, with 89.78% of families involved in agriculture (BPS Kebumen, 2021).

Efforts to improve agribusiness and increase rice production and productivity include the *Integrated Crop Management Field School* (*SL-PTT*), an integrated, synergistic, and participatory approach aimed at enhancing rice production and increasing farmers' income (Thamrin et al., 2009). The *Agricultural Technology Innovation Field School* is a non-formal education forum for farmers to enhance their knowledge and skills in recognizing potential, preparing farming plans, solving problems, making decisions, and applying technology suitable for local resource conditions in a sustainable manner. This school involves active farmer participation, with comprehensive and continuous education, covering everything from seed preparation and land processing to post-harvest handling.

In 2021, Klirong Subdistrict received the *Agricultural Technology Innovation Field School* program from the Central Java Provincial Agriculture and Plantation Office. The program targeted 50 farmers from four villages: Kebadongan, Dorowati, Podoluhur, and Kedunwinangun. These farmers were members of ten farmer groups, with five representatives from each group. The purpose of the field school was to teach farmers how to manage harvests and post-harvest processes to minimize crop loss and increase the value-added of their products.

The field school model involved hands-on activities, such as harvesting with power threshers, calculating harvest loss in the field, and packaging rice to increase its market value. Through this program, Klirong farmers were expected to improve their behavior, attitudes, and skills in managing harvests and post-harvest activities, transforming their mindset and fostering innovative ideas.

Farmer empowerment through the field school encourages farmers to discuss, identify issues, and generate innovative ideas together. Farmers are involved in observing their problems firsthand and collaboratively solving them, thus promoting self-reliance. The field school activities took place in 2021, and an evaluation of its implementation is necessary to assess its effectiveness. According to the *Kamus Besar Bahasa Indonesia (KBBI)*, "implementation" refers to the process of executing or applying plans and obligations (https://kbbi.web.id/implementasi).

Rangga's (2015) research on the design and implementation of the *SL-PTT* shows that the annual planning for *SL-PTT* activities is not based on evaluations of field performance and implementation. Over five years, the annual targets for *SL-PTT* increased significantly without considering the capacity to sustain the program's success. The study also revealed that the *SL-PTT* implementation did not fully adhere to its basic principles, with low adoption rates of its technological components and a limited number of agricultural extension workers supporting the program's success. Another study by Shiqik (2015) on the farmer education process through *SL-PTT* in South Sumatra showed that adult learning methods (*POD*) were used, combining 30% lectures and 70% participatory activities such as simulations, practices, and group discussions in demonstration plots or field laboratories.

Farmer education through *SL-PTT* is expected to improve farmers' knowledge and skills in integrated and sustainable crop cultivation. Increasing agricultural production through the *SL-PTT* approach is a strategy that can contribute significantly to national food production. This approach will succeed in increasing farmers' knowledge and skills, improving production, and increasing their income when supported by all stakeholders, including policymakers at both the national and local levels. Jerry's (2020) research shows that knowledge improvement leads to increased production, with farmers successfully applying the theories they learned in the field. Therefore, the implementation of the *Agricultural Technology Innovation Field School* should be further explored to evaluate its benefits for participating farmers and provide input for organizers to improve the program.

The urgency of this research stems from the critical need to evaluate the effectiveness of agricultural extension programs, particularly field schools, in enhancing farmers' capabilities and agricultural productivity. Post-harvest losses in rice production remain a significant challenge in Indonesia, with estimates indicating losses of 10–20% during harvest and post-harvest handling. The *SLPITP* program in Klirong District represents an innovative approach focusing specifically on harvest and post-harvest management, which differs from traditional field schools that primarily concentrate on cultivation practices. Given the substantial investment in agricultural extension programs and the need for evidence-based policy making, a comprehensive evaluation of *SLPITP* implementation is essential to understand its effectiveness and provide recommendations for program improvement and scaling.

Previous research on field schools has demonstrated mixed results regarding their effectiveness in improving farmer knowledge and agricultural outcomes. Rangga (2015) found that *SL-PTT* implementation often failed to adhere to basic principles, with low adoption rates of technological components and insufficient support from agricultural extension workers. Similarly, Sidiq (2015) showed that while field schools used appropriate adult learning methods, their long-term impact on farmer behavior and productivity remained limited. Studies by Ernawati et al. (2015) and Fachrista (2013) highlighted the importance of farmer participation and capacity building in determining field school success. However, most previous research focused on *Integrated Crop Management Field Schools (SL-PTT)* rather than specialized programs like *SLPITP*. Additionally, limited research has examined the specific challenges and opportunities associated with post-harvest-focused field schools, particularly in the context of smallholder rice farming systems in Java.

Research gaps identified in the literature include insufficient attention to post-harvest-focused field school programs, limited understanding of farmer adoption patterns for harvest and post-harvest technologies, and inadequate evaluation of the long-term sustainability of field school interventions. Most studies have concentrated on production-oriented field schools, leaving a significant knowledge gap regarding the effectiveness of post-harvest and value addition-focused programs. Furthermore, there is limited research on the role of local context, farmer characteristics, and institutional support in determining field school success, particularly in the Indonesian setting.

The novelty of this research lies in its focus on the *Agricultural Technology Innovation Field School (SLPITP)*, which specifically targets post-harvest and harvest management rather than general crop cultivation. This represents a departure from traditional field school approaches and provides an opportunity to evaluate a more specialized intervention model. The research also contributes to the limited body of knowledge on post-harvest technology adoption among smallholder farmers in Indonesia. Additionally, the study employs a comprehensive qualitative approach that captures multiple stakeholder perspectives, including farmers, extension workers, and government officials, providing a holistic understanding of program implementation and outcomes.

The objectives of this research are threefold: (1) to analyze the implementation process of the *Agricultural Technology Innovation Field School* program in Klirong District, including its activities, methods, and participant engagement; (2) to identify challenges and obstacles encountered during program implementation and their impact on outcomes; and (3) to evaluate the effectiveness of the program in enhancing farmers' knowledge, skills, and adoption of agricultural technology innovations. The benefits of this research include providing evidence-based insights for agricultural extension policy and program design, contributing to the academic literature on farmer education and technology adoption, and offering practical recommendations for improving field school programs. The implications extend to supporting food security initiatives through reduced post-harvest losses and enhanced farmer capabilities, ultimately contributing to sustainable agricultural development and improved rural livelihoods.

The novelty of this research lies in the type of field school activity being implemented. The *Agricultural Technology Innovation Field School (SLPHITP)* focuses on post-harvest and harvest management, whereas previous field schools, such as *SL-PTT* (*Integrated Crop*

Management Field School) or *SLPHT* (*Integrated Pest Management Field School*), primarily concentrated on rice cultivation from planting to harvesting. The urgency of the theory applied in *SLPHITP* innovation technology utilizes a qualitative descriptive research method to collect and obtain comprehensive data on the implementation of the field school program in agricultural technology innovation. The program focuses on teaching farmers about integrated pest management, climate-specific farming, and cultivation technology. Farmers are trained in integrated farming, including seed provision, pest control, technology use, and fertilization. The implementation of this program is expected to equip farmers with consistent knowledge across all aspects, from seed provision to pest control, cultivation technology, and fertilization. During the *SLPHITP* activities, agricultural extension officers guide the farmers, teaching them proper agricultural practices to enhance agricultural productivity.

METHOD

This research uses a qualitative descriptive research method to collect and obtain comprehensive data that will be used as detailed information on the implementation of the *Agricultural Technology Innovation Field School* program in Klirong District, Kebumen Regency (Prof. Dr. Sugiyono, 2021). It is expected that this qualitative descriptive method will provide complete, accurate, factual, and in-depth information so that the research objectives can be achieved. Qualitative research is based on a post positivism philosophy and is used to investigate the natural conditions of the object, where the researcher serves as the key instrument. Data collection is conducted through triangulation (combined methods), data analysis is inductive/qualitative, and the results emphasize meaning rather than generalization.

The approach used in this research is a qualitative descriptive approach because the data obtained are descriptive in nature and do not use numerical figures to explain the results. This study aims to gain a deep understanding of the role of the field school program in the application of agricultural technology innovation in Klirong District, Kebumen Regency. The villages involved in this activity include Podoluhur (4 farmer groups), Kebadongan (2 farmer groups), and Kedungwinangun (4 farmer groups).

The research location was determined *purposively* (intentionally). According to Sugiyono (2018:138), *purposive sampling* is a sampling technique based on specific considerations according to predetermined criteria for selecting the sample to be studied. The research location criteria were based on the fact that Kebumen Regency is one of the districts in Central Java Province that received the *SL-PITP* program and has relatively high rice production. One of the subdistricts actively applying the *SL-PITP* program is Klirong, which is supported by agricultural extension workers from the Klirong District *Agricultural Extension Center* (*BPP*) and has 50 farmers from 10 farmer groups who participated in the *Agricultural Technology Innovation Field School* in 2021. Therefore, Klirong District was selected as the research location because it meets the criteria for this study.

For the selection of informants, the researcher also used *purposive sampling*. According to Sugiyono (2012:54), "*Purposive sampling* is a sampling technique based on certain considerations. Informants were chosen because they were believed to be the most knowledgeable about the issues being researched." In this research, the primary informants were the heads of farmer groups who participated in the program, along with the members of

these groups. The human resources involved in the field school had received basic formal education, were willing to participate, were in good health, enthusiastic, courteous, and served as group leaders. Secondary informants included staff from the Provincial Agriculture and Plantation Office of Central Java, the Head of Extension Division, the Sub-coordinator of Extension, *BPP* Klirong, and the village heads.

Data collection is a crucial step in research because the main objective is to obtain valid data. Without proper data collection techniques, the researcher cannot obtain the required information. In this study, data collection techniques included observation and interviews. Observation was conducted systematically by recording events. According to Sutrisno Hadi (1989) in Sugiyono (2018:145), observation is a complex process that involves both biological and psychological aspects, including perception and memory. In this research, the researcher used unobtrusive observation, meaning the research subjects were aware from the beginning that they were being observed, making it easier to collect information and data.

Interviews were conducted in both structured and unstructured formats, either face-to-face or by phone (Sugiyono, 2018:138). An interview is a process in which two people exchange information and ideas through questions and answers, constructing meaning around a particular topic. Interviews in this study were carried out continuously during the research period to collect all necessary information from informants. The open-ended questions focused on the field school program's impact on agricultural production.

The data analysis technique in this research involved systematically searching for and organizing data obtained from interviews, field notes, and documentation. The goal was to arrange the data into categories, break them into meaningful units, synthesize them, identify significant themes and patterns, and draw conclusions that are easy to understand. According to Bogdan in Sugiyono (2018), data analysis is the process of systematically organizing and interpreting data to make it comprehensible and shareable. In qualitative research, data analysis is inductive, meaning it is based on the data collected.

The analysis was carried out interactively in three stages: data reduction, data display, and conclusion drawing/verification. In the data reduction stage, information was summarized, selected for relevance, and focused on the essential aspects of the research problem. This reduction continued throughout the research process, helping to simplify and clarify findings. The next step was data display, where data were presented in a structured form, such as narratives, charts, or diagrams, to facilitate understanding. Finally, conclusion drawing and verification were conducted by interpreting the data to generate findings and ensuring their credibility and validity.

RESULTS AND DISCUSSIONS

General Overview

Klirong Subdistrict is one of the subdistricts in Kebumen Regency. Geographically, Klirong is located at coordinates 7.7696 – 7.6893 South Latitude and 109.6092 – 109.6464 East Longitude, with an area of 4,325 hectares or 43.25 km², situated at an average elevation of 13-24 meters above sea level. The boundaries of Klirong Subdistrict are as follows: to the west, it borders Petanahan Subdistrict; to the east, it borders Buluspesantren Subdistrict; to the north, it borders Pejagoan Subdistrict; and to the south, it borders the Indian Ocean. Klirong consists of

24 villages, with Kedungwinangun being the farthest from the subdistrict capital at 7 km, but the closest to the Kebumen district capital at 6 km. Klegenwonosari, being the subdistrict capital, is the nearest village to the subdistrict center, while Jogosimo is the farthest from the district capital, at 20 km. The area of Klirong Subdistrict is 4,325 hectares, with 1,391 hectares (32%) of rice fields and 2,934 hectares (68%) of dry land. Tanggulangin Village has the largest area of 509 hectares (11.76%), while Karangglonggong Village has the smallest area, covering 82 hectares (1.90%). Klirong's population is 55,124, with 27,638 males (50.14%) and 27,486 females (49.86%), showing a minimal gender ratio difference of 0.28%. Most of Klirong's residents are farmers, with rice farming being the primary occupation.

During the first planting season (MT 1), rice production amounted to 12,437 tons from 1,353 hectares of rice fields. Podoluhur Village had the highest rice production at 1,521.9 tons, while Klegenwonosari had the lowest at 457.9 tons. During the second planting season (MT 2), rice production reached 8,563.36 tons from 1,322 hectares, with Podoluhur again leading with 1,154.56 tons, and Gebangsari producing the least at 268 tons. Most of the rice fields are irrigated by technical irrigation systems. Additionally, Klirong has 9 villages with dry land for farming, producing 2,319.34 tons of field rice in MT 1 (2018) and 4.63 tons in MT II (2019). The area also grows maize and other crops, with maize fields covering 532 hectares and producing 4,952 tons, while coconut plantations span 2,498 hectares with a production of 279 tons. The research was conducted in Kedungwinangun, Podoluhur, and Kebadongan villages, with a total of 10 farmer groups participating in the Agricultural Technology Innovation Field School program.

Data and information for this research were obtained from various sources. Primary data regarding the region and its people were collected through observations and interviews with individuals who are knowledgeable about Klirong Subdistrict and its natural resources, including village heads and their staff. Secondary data were gathered from various journals on the implementation of Agricultural Technology Innovation Field Schools and their challenges. Information about the potential of Klirong Subdistrict, both its natural resources and human resources, can be accessed directly from the official Klirong Subdistrict website. The research began by collecting data on the profile of Klirong Subdistrict and the Agricultural Technology Innovation Field School program in Kebumen. The study was then continued with the collection of data and information on the implementation of the Agricultural Technology Innovation Field School and its challenges.

The researcher conducted in-depth interviews with the heads of the farmer groups involved in the Agricultural Technology Innovation Field School, village heads or secretaries, the coordinator of the Klirong District Agricultural Extension Center, agricultural field extension workers in Kedungwinangun, Podoluhur, and Kebadongan villages, sub-coordinators from the Agriculture and Food Security Office of Kebumen, and agricultural extension officers from the Central Java Provincial Agricultural and Plantation Office. The in-depth interviews were conducted on November 16, 2024, with the heads of 5 farmer groups, and on February 17, 2025, with the heads of 5 more groups, including several key figures such as the sub-district secretary and village heads. A Focus Group Discussion (FGD) was held on February 22, 2025, at Dapur Amazing Klirong Restaurant to gather additional insights about the program's implementation and its challenges. Further interviews were conducted on March 11, 2025, with

several agricultural experts from the Kebumen Regency and Central Java Provincial agricultural offices via online platforms.

The informant selection was based on purposive sampling. As described by Sugiyono (2012:54), purposive sampling is the process of selecting data sources based on specific considerations, with the researcher choosing informants who are considered to have the most relevant knowledge about the issues being studied. The main informants were selected based on their significant involvement in the Agricultural Technology Innovation Field School program, including the heads of the participating farmer groups. Supporting informants included village heads, sub-district officials, and agricultural extension workers from both the Kebumen Regency and Central Java Provincial offices. The informant criteria for this study were based on their deep knowledge of the topic, current involvement in related activities, and ability to provide valuable and accurate information. The selected informants included 21 people with various backgrounds, including farmers, government officials, and agricultural experts, each having distinct characteristics such as age, education level, and occupation, but meeting the necessary criteria for providing relevant data for this research.

The majority of informants in this study are aged between 51 and 65 years, with 13 people (61.91%). The age group of 41 to 50 years comprises 6 people (28.57%), and the smallest group is aged 31 to 40 years, with only 2 people (9.52%). The predominance of informants in the 51-65 age range suggests that the Agricultural Technology Innovation Field School participants are mostly older farmers who manage rice fields on a daily basis. The 41-50 age group, which includes agricultural field officers, indicates that the main farmers are still in the 51-65 age range. The youngest group, aged 31-40 years, consists of agricultural extension workers. Information regarding the field school program and its development can be gathered from both young and older farmers. However, interviews revealed that age influences mindset. Younger informants provided more detailed and innovative information, especially regarding the use of technology in agricultural innovation. In contrast, older informants tend to be more content with the status quo and less receptive to new ideas. Older farmers may have extensive experience in agriculture, but their physical limitations affect their ability to adopt new farming practices. Younger farmers, though lacking experience, are more open to new innovations.

The educational background of the informants varies greatly, ranging from junior high school (SLTP) to postgraduate (S2). However, most informants (57.14%) have completed senior high school (SLTA) or its equivalent. Seven informants (33.34%) hold a bachelor's degree (S1), one informant (4.76%) has completed junior high school, and one informant (4.76%) holds a postgraduate degree. The interviews revealed that informants with lower educational levels, such as SLTP graduates, tended to answer questions more simply but had strong technical knowledge due to their field experience. Informants with SLTA education responded well and were able to explain their involvement in the field school and provide valuable suggestions. Those with higher education, such as S1 and S2, were able to answer questions thoroughly, explaining the activities of the field school and offering ideas to improve the program. Education plays a critical role in shaping a person's mindset and perspective, which, in turn, influences their behavior and adoption of new technologies (Lionberger & Paul Gwin, 1989).

The most common educational background among field school participants was SLTA, which may affect their ability to implement advanced technology and, consequently, the quantity and quality of agricultural output. Informants in this study were not only farmers but also individuals from various professions involved in the development of the field school, including village heads, secretaries, and agricultural officers from the Kebumen Regency Agricultural and Food Security Office. Among the informants, 10 (47.62%) were farmers, 2 (9.52%) were village heads representing Podoluhur and Kebadongan, and 1 (4.76%) was the secretary of Kedungwinangun Village. Additionally, informants included officials from the district government, such as the sub-district secretary, head of the extension team, and agricultural extension workers from the Central Java Provincial Agricultural and Plantation Office.

Implementation of Field School for the Implementation of Agricultural Technology Innovation

Implementation according to the Great Dictionary of the Indonesian Language (KBBI) means implementation or application. In general, implementation is the action or implementation of a plan that has been carefully prepared. The Field School is a non-formal school for farmers with a learning approach to improve farmers' knowledge and skills. Field schools aim to increase agricultural production with practical and participatory learning methods. Various kinds of field schools for farmers such as the Climate Field School that studies about the climate, the Integrated Pest Control Field School that learns how to control pests and diseases in rice plants, the Integrated Crop Management Field School that studies about the management of rice cultivation in an integrated manner. The Field School for the Application of Agricultural Technology Innovation is a field school that learns about harvesting and post-harvesting rice.

Implementation of Field School The application of Agricultural Technology Innovation is the implementation of field schools that focus more on harvest and post-harvest activities. The Field School Activity for the Application of Agricultural Technology Innovation consists of 6 meetings which include

1. Socialization of the application of agricultural innovation technology
2. Field practice using power carrier.
3. Practice of calculating rice harvest shrinkage/loss of rice yield
4. Cultivation of special rice plants to increase the added value of agricultural products
5. Packaging rice with plastic and vacuum machine
6. Review of activities and Follow-up Plans (RTL)

Field School

The Agricultural Field School (SL) is a non-formal learning process for farmers aimed at enhancing their knowledge and skills in recognizing potential, preparing business plans, identifying and solving problems, making decisions, and applying technological innovations in a synergistic and environmentally-conscious manner to ensure more efficient, high-productivity, and sustainable farming practices. Field schools can be considered one of the most effective teaching methods, especially for adults (andragogy), due to their informal nature. The

learning process takes place in the field, where real-life objects are used as teaching materials. This approach is designed to accelerate the implementation of agricultural technological innovations.

The Agricultural Technology Innovation Field School involves 10 farmer groups, consisting of 2 groups from Kebadongan Village, 4 groups from Podoluhur Village, and 4 groups from Kedungwinangun Village. Each participating group assigns members to attend the school, with each participant required to attend 6 consecutive meetings held at the Klirong District Agricultural Extension Center (BPP), rice fields, or other practical locations. A total of 50 farmers from these 10 groups participated, where they engaged in discussions to address challenges faced by farmers and agreed upon activities such as practicing rice threshing with a power thresher, calculating harvest losses during and after harvest, visiting successful rice farmers (especially those cultivating red or black rice), and packaging special rice to increase its market value. Additionally, the participants were tasked with preparing a Follow-up Action Plan (Rencana Tindak Lanjut - RTL) after completing the field school.

During the program, each farmer group received equipment to support their learning, including a power thresher, tarpaulins, moisture measuring tools, serrated sickles, vacuum packaging plastic, and packaging stickers. The power thresher, sickles, and tarpaulins were used during rice threshing practices, while the moisture measuring tools helped farmers assess the water content in rice during harvest and post-drying. The vacuum packaging and stickers were used to enhance the packaging of rice to add value. The program's success is further supported by providing participants with snacks and lunch during the sessions, and the provided equipment became the property of the farmer groups for future use in subsequent harvests, ensuring sustainability and continued use of the acquired skills.

Series of Field School Activities for the Implementation of Agricultural Technology Innovation

The series of field school activities for the application of agricultural technology innovations began with the selection of field school implementation areas that have the dominant potential for superior rice commodities. The field school involved 10 (ten) farmer groups from the villages of Kebadongan, Podoluhur, and Kedungwinangun. Each poktan assigns 5 (five) administrators or members so that the number of participants in the field school is 50 people. Field school meetings were held 6 times with alternating meeting materials or themes.

1st Field School (SL)

The activities at the first meeting of the Agricultural Technology Innovation Implementation Field School included socialization activities for pilot activities in the application of agricultural technology.

Present at the event was the Fungsonal Position Group of the Kebumen Regency Agriculture and Food Service represented by Mr. Istiantoro, S.P., M.Si, said that this Field School has only one sub-district in one district, after going through a verification and scrutiny process that the Klirong District Agricultural Extension Center is included in the criteria for the implementation of this SL Application of Agricultural Technology.

The coordinator and extension workers of WKPP (Agricultural Extension Work Area) conveyed the socialization of SL activities on the Application of Agricultural Technology and the joint discussion for this Field School Activity as many as 6 times focusing on Harvest and Post-Harvest.

2nd Field School (SL)

Field School participants participated in harvesting in the rice fields and practiced threshing rice using a Power Threser and a standard width harvest mat of 4x6 meters so that not much of the threshing was lost. Each group took turns trying the power thesser tool. Participants can distinguish between the use of traditional and modern alsintan. SL participants were given the opportunity to ask questions about the use of power thesser and harvest mats.

3rd Field School

At this meeting, it was conveyed about the loss of crop shrinkage. The goal is to obtain data on the amount of yield shrinkage in post-harvest handling, rice threshing, transportation, drying, drying, milling, packaging and storage.

4th Field School (SL)

This meeting was delivered by Mr. Akhmad Munawar Kamil, chairman of P4S See My Garden, Candiwulan Village, Kebumen District, to convey experiences and methods of cultivating special rice plants, including black rice, red rice and fragrant rice (flavored rice) to increase the added value of agricultural products. Special rice cultivation requires special treatment, especially fertilization and harvesting and post-harvest methods.

5th Field School (SL)

This meeting discussed rice packaging in order to increase the selling value or added value of rice products. Participants practice packing 1 kg of rice with a plastic gannet and vacuum and sealer with a vacuum packaging machine. Participants enthusiastically followed this practice. Each participant took home the results of their practice and was given a packaging sticker.

6th Field School (SL)

The sixth or last meeting was attended by the Central Java Provincial Agriculture and Plantation Service Team, Mr. Wahyu. Conveying that this activity will continue even though the SL activity has ended as a follow-up to the field school. At this meeting, all participants were invited to review yesterday's activities. Participants are asked to make an RTL (Lanut Action Plan) after participating in this SL. Each group presented its activity plan. Participants are quite enthusiastic about wanting to produce rice and want to package themselves with an attractive appearance and will learn how to sell online. Informant knowledge about field school activities in the application of agricultural technology innovations.

The researcher conducted in-depth interviews with the participants of the Field School, submitting 9 questions for the informant to respond to. The 21 informants consisted of 10 representatives from farmer groups, 1 Coordinator of PPL of Klirong District, 3 agricultural extension workers, 1 Secretary of the Klirong Sub-district Head, 2 Village Heads and 1 Village Secretary, 1 Head of the Extension Division of the Kebumen Regency Agriculture and Food Office, 1 Head of the Extension Work Team for the Extension of the Kebumen Regency Agriculture and Food Office, and 1 young agricultural extension worker from the Central Java Provincial Agriculture and Plantation Office.

The researcher conducted interviews from November 2024 to February 2025. Questions submitted to the informant include:

1. Knowledge of field schools
2. Knowledge of field schools for the application of agricultural technology innovations
3. Facilities and Infrastructure during the field school for the implementation of agricultural technology innovation
4. A series of field school activities for the application of agricultural technology innovations
5. Knowledge of harvest and post-harvest before attending field school
6. Knowledge of harvest and post-harvest after attending a field school
7. Opinions about the most interesting activities during the field school
8. Obstacles while attending a field school
9. Further plans after attending an outdoor school.

The informant's answer about field schools, namely Field Schools (SL), is a learning method that is carried out in the field, without walls, and is informal. SL aims to improve participants' knowledge and skills. SL agriculture is carried out on the land of SL participating farmers. SL agriculture aims to improve farmers' knowledge in order to improve the quality of agriculture. SL agriculture can take advantage of local potential, such as the use of local seeds and natural fertilizer facilities. Characteristics of SL. SL is a critical education concept, which emphasizes participants to learn and produce knowledge from their own experiences. SL is designed in such a way that farmers' learning opportunities are wide open. SL involves all aspects of learning, namely intellect, feeling/soul and practice.

Based on the informant's answer about the agricultural technology innovation field school, it can be concluded that the Agricultural Technology Innovation Field School is a teaching and learning activity in the field that aims to improve farmers' knowledge and skills in implementing agricultural technology innovations. The objectives of the Agricultural Technology Innovation Field School Are to improve farmers' knowledge and skills, To increase the capacity of farmers in implementing technological innovations, To increase agricultural productivity, To increase farmers' understanding of better agricultural methods, To improve the quality of agriculture.

Rice fields as the Main Learning Facility of Field Schools. Ecological-organic farming skills and rice plant diversification are applied skills. Therefore almost 80% of the overall time is spent directly in the rice fields, not in the classroom. How to Learn Through Experience. Each activity begins with appreciation or direct observation, then the disclosure of experience, the assessment of the results, and the conclusion of the results. This learning cycle is pursued in every field school activity. Agro-ecosystem Studies. Field schools are patterned in a weekly cycle where each element of the agro-ecosystem is systematically and in-depth studied. This is based on the consideration that changes in the state of the agro-rice field ecosystem are quite different from one week to another. Every weekend, the state of the agro-ecosystem is prepared in its entirety for the assessment and decision-making of land management the following week. This cycle resembles the principle of weekly monitoring that will be applied at the farmer level and accustomed the training participants to continue to follow the development of their rice fields for one season, from land preparation to post-harvest.

Practical and appropriate methods and materials. Each field school activity, along with its supporting materials, is designed in such a way that it can be applied directly by farmers in the village. Thus, the skills and experience gained by the participants will be a provision that is mastered, which can be easily transferred into daily tasks at the village level. Curriculum Based on Required Skills. The curriculum is designed on the basis of the analysis of the field skills that a farmer needs to possess to become an expert in ecological-organic agriculture and rice crop diversification, so that he really understands and is able to apply them on his own land, as well as pass them on to other farmers. In addition to agricultural skills and technical knowledge, participants also gain skills in activity planning, cooperation, group dynamics, development of learning materials, and communication, so that they can become facilitators who are able to stimulate and help farmer groups effectively.

The series of activities of the Field School (SL) of agricultural technology innovation includes preparation, implementation, monitoring, and evaluation. Preparation includes conducting preparatory meetings with prospective participating farmers, formal and informal figures. Determine objectives, expected outcomes, and learning methods. Create a schedule for SL meetings. Determine the location of SL-PTT. The implementation of knowledge and experience sharing between farmers and agricultural experts. Active discussions and Q&A between participants. The application of technology that is tailored to the wishes and preferences of farmers. Monitoring and Evaluation. Conducting monitoring and evaluation meetings to increase the capacity of farmers. Escort and assistance at every stage. Conducting a Field Day (FFD). SL agriculture is a school without walls whose teaching and learning process is carried out in the field. The goal is to increase farmers' knowledge in order to improve the quality of agriculture. Agricultural technology innovations that can be applied in SL include: The use of organic fertilizers. Water resource management, basic and choice technologies, and technologies that take into account the physical, biophysical, climatic, and socio-economic conditions of farmers.

Harvesting is the process of collecting the results of cultivation as the final activity in the cultivation cycle, while post-harvest refers to the handling of the crops immediately after they are harvested. Manual harvesting involves collecting the crops by hand, while post-harvest includes processing activities such as threshing, drying, cleaning, sorting, storage, and packaging. Manual harvesting can be done with hands, scissors, knives, or digging tools and is typically used for various crops like rice, pepper, strawberries, and figs. It helps reduce mechanical damage to the harvest and allows for the selection of fruits and vegetables at their optimal ripeness. Post-harvest activities aim to prepare the crops for storage and marketing, often using simple tools like wooden boards and nails, and employing appropriate packaging systems to reduce losses.

Manual rice harvesting involves cutting the rice stalks with a sickle and manually threshing the rice. This method remains popular among farmers due to its accessibility, affordability, and ease of use. The advantage of manual rice harvesting is that the tools are easy to acquire and inexpensive, and it can be used in various land conditions, including terraced fields. In traditional approaches, rice harvesting involves collective participation from the local community. However, manual harvesting is labor-intensive, dependent on human labor, and not as efficient. The tools used include sickles, tarpaulins, threshing tools (gepyokan), and

wooden boards. Post-harvest activities in manual systems include threshing, cleaning, and packaging. Threshing can be done manually with tools that have a "hold on" type mechanism, where the straw is held while the rice grains are separated. Cleaning follows threshing to facilitate transport, and the rice is cleaned again after drying to remove any impurities. The rice is then manually packaged into 40 kg or 50 kg plastic sacks, and the open ends are sewn shut by hand, with labels added to provide information about the product.

The Agricultural Technology Innovation Field School (SLPITP) is a field-based learning activity designed to improve farmers' knowledge and skills. The goals of this program include enhancing farmers' understanding of the latest agricultural technologies, increasing their capacity to make decisions and solve problems in the field, and improving agricultural productivity and quality. The training includes topics such as seed selection, the use of organic fertilizers, and water resource management. By sharing knowledge and experience between farmers and agricultural experts, the program helps improve farmers' understanding of better agricultural methods and contributes to higher production outcomes. However, there are challenges such as low initial knowledge among farmers, limited interest in learning, and insufficient participation in activities. The program also faces external challenges like the "ijon" purchasing system, where traders buy crops before harvest. Despite these issues, the Field School aims to address these challenges by fostering active participation from farmers in all stages of planning, implementation, and evaluation, ensuring that the improvements made during the program are sustained through follow-up activities (Rencana Tindak Lanjut - RTL).

Obstacles to the Implementation of Field Schools for the Implementation of Agricultural Technology Innovation in Klirong District

Obstacles to field school activities in the application of agricultural technology innovations such as low farmers' initial knowledge, lack of interest in learning farmers, difficult material characteristics to visualize, lack of interest in the topic, low active participation, and lack of carrying capacity (equipment). The internal constraint of the farmers themselves is human resources or the work ethic of farmers who are reluctant to carry out quality assurance and do not want to bother. Farmers' income is still low, forcing farmers to sell directly in the form of harvested dry grain. The ability of capital resources in post-harvest handling requires capital in land leasing (drying floors), drying equipment and threshing, on rice plants, peeling tools, drying tools on corn, in addition to harvesting tools that are quite expensive so that farmers are reluctant to carry out post-harvest processing. External constraints The existence of a permit purchase system is that purchases are made before harvest by wholesalers or collectors.

These obstacles can be anticipated with the enthusiasm of farmers in participating in field schools, bodies in good health so that field schools run smoothly and optimally. Farmers' participation is emphasized so that farmers feel that they have a responsibility to always be active in Field School activities starting from the planning stage, implementation stage and evaluation stage. Farmers' participation in the Field School is certainly influenced by various factors. And in each region there are certain factors that can differ from one region to another, or a condition with another. The same thing also happened in Kebumen Regency. The lack of optimal implementation of the Field School is a problem that must be solved so that agricultural

development efforts in Kebumen Regency are more effective and get results in accordance with expectations.

Obstacles to the implementation of field schools for the application of agricultural technology innovations in Klirong District

The marketing of rice packaging is difficult to market, the power supply is not a problem, different from those sold in the market, the grain comes out from the side, mixing with dirt is difficult to separate even though there is a fan, the power supply is also lent to other groups with a rent of 10 kg / day, gasoline from the group than not wanting, 2 x harvest is not used, the make blm want because it brings to the middle of the rice fields not strong because it is heavy, not modified, the farming roads are damaged so that it is difficult to bring power to the farm, the ownership of many rice fields is far from the road, to grow special rice is not interested because they do not want to take the risk of purchasing power people are more likely to plant ordinary varieties such as Mekongga, ciherang is not interested in nutrizinc rice because the yield is small.

Packing is constrained by high electricity, water content tools are rarely used, prefer to be beaten, the tarpaulin for rendeng season is easily damaged and torn because it is good coupled with a thick mesh of meters combined in it, when the rainy season is not possible, it is still safe from shrinkage if you use a tarpaulin.

Power tanker is still used because there is a fan, it has never been serviced, the one who uses the same harvest squad, the gasoline that bears the rice field, 15 times used, have tried special rice and want to know where to continue the activity and for the tool has never been serviced.

Farmers' follow-up plans after participating in field school activities can be in the form of:

1. Apply the knowledge gained
2. Conduct follow-up meetings
3. Extend the propagation of biological agencies independently
4. Using new superior varieties (VUB)
5. Use quality seeds
6. Managing specific nutrients/manure/compost
7. Maintain adequate irrigation
8. Apply the concept of PHT

The follow-up plan for farmers after participating in field school activities in Klirong District is to want there to be more school activities, the group yesterday that participated could be independent and followed by other groups, the use of power harness was used again. Has a power terrace of 2 fans, harvests the weight of the saiga for special rice, keeps planting 2x, always makes solid organic fertilizer from neighboring animal manure, a mixture of cow and goat manure, jarwo planting pattern, want someone to sell their brown rice. You can try to learn online marketing. Other follow-up plans will continue to use existing aid tools and will try other special rice cultivations. The follow-up plan of farmers will always want to know the latest steps or the latest method that is the easiest, then the sale of agricultural products is also easy,

yes with cellphones, then the increase in agricultural yields, then balanced fertilization, better harvests, organics, also increases, and crop price stability.

CONCLUSION

Based on the results, it can be concluded that the implementation of the *Agricultural Technology Innovation Field School (SLPITP)* in Klirong District has demonstrated significant success in providing comprehensive knowledge and practical skills to participating farmers through its innovative post-harvest-focused curriculum. The program's unique wall-less educational approach, conducted directly in field settings, effectively delivered training across six critical areas, including technology innovation socialization, power thresher operation, harvest loss calculation, specialty rice cultivation, vacuum packaging techniques, and strategic follow-up planning. The hands-on methodology, combined with the provision of essential equipment—including power threshers, moisture measurement tools, and packaging machinery—ensured immediate practical application and long-term sustainability of acquired skills. Despite facing challenges related to initial farmer knowledge limitations, capital constraints, infrastructure deficiencies, and market system barriers such as the *ijon* purchasing practice, the program achieved positive outcomes through participatory learning and comprehensive support provision. The Kebumen Agriculture and Food Security Office's commitment to continued annual funding and program expansion to four subdistricts in 2025, with an *IDR* 136 million budget, demonstrates institutional recognition of program effectiveness. Future research should focus on conducting longitudinal impact assessments to measure the long-term adoption rates of the introduced technologies, evaluating economic outcomes for participating farmers, developing scaling strategies for broader geographic implementation, and exploring integration possibilities with digital marketing platforms to enhance farmer market access and income generation. Such advancements would contribute to sustainable agricultural development and improved rural livelihoods across diverse agricultural contexts in Indonesia.

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