Impact of Agricultural Technology on Rice Farmers Welfare in Bojongjaya Village, Pusakajaya District, Subang Regency

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ABSTRACT
Rice farmers in Pusakajaya sub-district primarily rely on traditional agricultural systems, neglecting the potential of Good Agricultural Practices (GAP) technology. This study investigates how GAP adoption impacts rice farmers' well-being in this context. Methodology: The study employs a qualitative approach, chosen for its effectiveness in exploring and describing objects and phenomena in detail. This allows for a more direct representation of the relationship between researchers and respondents, facilitating deeper understanding of the lived experiences and perspectives of rice farmers. Data collection involved interviews with farmers and other stakeholders, providing rich insights into the perceptions and realities of GAP adoption in the context of Pusakajaya. Findings reveal that GAP technology holds significant promise for wider adoption due to its demonstrably positive effects on crop yields and farmer income. Increased yields and improved quality translate to enhanced market value and greater profits, ultimately contributing to improved farmer well-being.
INTRODUCTION

Rice, an undeniable cornerstone of Indonesian society, permeates all facets of daily life. Its influence transcends mere sustenance, shaping political order and national stability. As the primary food source for over 95% of the population, paddy fields are the lifeblood of numerous rural communities. Consequently, prioritizing increased yields per unit area through the adoption of innovative cultivation techniques is paramount (Akbar, 2021).

According to the Central Statistics Agency (BPS), the average rice consumption of the Indonesian population is remained unchanged since pandemic. On 2018 consumption rice from all type, including local, superior quality and imported rice, the average reaches 1,404 kg per capital per week. This number then fell to 1,374 kg per capita per week in 2019. However, when pandemic struck, average consumption climbed to 1.37 kg per capita per week on 2021.

The agricultural sector has multiple functions, including food production, farmer welfare, and environmental sustainability. For Indonesia, it is important to consider these functions when developing agricultural incentive policies. Incentives should be broad-based and include economic measures, such as subsidies and protection, as well as support for agribusiness development. Sustainable agricultural land development can be achieved if these incentives help to improve farmer welfare and reduce poverty. (Wahyudi, 2018)

Good Agricultural Practices (GAP) is a set of guidelines for the cultivation of rice that is good, correct, environmentally friendly, and safe to consume. The implementation of GAP can increase productivity, income, and farmers' welfare (Nahraeni, 2020).

GAP is an integrated rice cultivation technology based on planting methods to post-harvest. In its implementation in the field, this rice technology uses: (1) Quality seeds of new high-yielding varieties. (2) Biodecomposers at the time of land preparation. (3) Biofertilizer as seed treatment and balanced fertilization. (4) Integrated pest management techniques. (5) Agricultural machinery, especially for planting and harvesting. The superiority of GAP technology has been tested in the 2016 planting season through a dem area of 50 ha on irrigated rice fields in Indramayu Regency, West Java. The Inpari-30 Ciherang, Inpari-32, and Inpari-33 varieties produced more than 10 tons of GKG/ha, while the productivity of the Ciherang variety cultivated by farmers outside the Dem area was only 6.0 tons of GKG/ha. Farm business analysis shows that GAP technology is very feasible to develop on a large scale.

In the sub-district of Pusakajaya, not all farmers have fully adopted modern good agricultural practices (GAP). In fact, most rice farmers still use traditional systems. Traditional agriculture is characterized by the use of simple, extensive methods that do not maximize the use of inputs such as technology, chemical fertilizers, and pesticides. The yields of traditional agriculture are highly dependent on soil fertility, water availability, climate, and topography. Due to its high dependence on nature, traditional agriculture is unpredictable and cannot meet the growing food needs of the population. This has led to the development of conventional agriculture, or more commonly known as modern agriculture.

Research on the use of GAP for rice in the sub-district of Pusakajaya is necessary because the sub-district is one of the areas with the highest rice production in Subang Regency. Based on data from the Subang Regency Statistics Agency in 2020, rice production in Pusakajaya reached
103.48 quintals/year with a harvest area of 7,136 hectares. This research is expected to determine the extent of farmers' understanding and implementation of GAP, as well as the factors that can affect farmers' welfare. The findings of this research can be used as recommendations for stakeholders and relevant agencies in realizing sustainable agriculture and a secure food supply.

LITERATURE REVIEW

Agriculture Technology

Agriculture technology is the application of principles of mathematics and natural sciences in order to economically utilize agricultural resources and natural resources for human welfare (Mangunwidjaja, 2009).

The advancement of technology in the field of agriculture is very important in increasing agricultural production. The renewal of agricultural technology plays an important role in optimizing agricultural production, considering that the increase in production through land expansion is difficult to apply in Indonesia, amid the increasing conversion of productive agricultural land to non-agricultural land. Farmers as the front-line of agricultural development play an important role in increasing agricultural production (Fatchiya, 2016).

Good Agricultural Practices (GAP) Technology

GAP technology has been implemented in Indonesia since 2003. Good Agricultural Practices (GAP) technology is one of the agricultural technologies used in Indonesia. It is a food safety assurance program that is applied to agricultural land. Good agricultural practices are the implementation of a certification system for agricultural production processes that use advanced technology, are environmentally friendly, and sustainable (FAO, 2010).

Use of Good Agricultural Practices Technology

Good Agricultural Practice (GAP) technology is an integrated cultivation technology for irrigated rice fields. The use of good agriculture or Good Agricultural Practices (GAP) from the producer's perspective is a concept that guarantees the welfare of farmers, their families, and their workers, while from the consumer's perspective, they get quality products with safe nutritional value. The concept of good agricultural practices also guarantees the sustainability of the environment, so the implementation of good agricultural practices can restore the condition of agricultural land that is increasingly damaged due to the use of chemical inputs (Shofi, 2019).

Level of Implementation of Good Agricultural Practices Technology

The agricultural sector plays a very important role in economic development, especially in agrarian countries with a tropical climate and located in the equatorial region. Progress in the field of agriculture will be realized if development planners, in this case the government, are serious about managing the existing natural potential and can improve the welfare of agricultural managers.

The implementation of agriculture requires certain stages. According to Arsyad (2004: 329), there are three stages of agricultural implementation, namely:
1. Traditional agriculture (subsistence agriculture). According to Todaro (2000: 456), "classical subsistence agriculture is agriculture where part of the output is consumed by the farmer's family, the main product is staple food ( staples food) only, and the productivity is low because it uses traditional equipment and minimal capital investment".

2. Diversification of agricultural products. According to Todaro (2000: 463), this stage can also be called mixed agriculture and diversified agriculture. This stage is a transitional stage that must be passed in the process of transition from subsistence agriculture to specialized products. Therefore, agricultural diversification (diversified farming) is a logical first step in the transition from traditional agriculture to modern (commercial) agriculture. At this stage, staple crops no longer dominate agricultural products, because new commercial crops such as fruits, coffee, cocoa, tea, and others have begun to be run together with simple livestock businesses.

3. Modern agriculture. This stage is also known as the specialization agriculture. It describes the most advanced level of agriculture. "In modern agriculture, the provision of food for self-sufficiency and the amount of surplus that can also be sold is no longer the main goal. Commercial profit is a measure of success and the maximum value per hectare of the results of human effort and natural resources is the main goal of agricultural activities" (Arsyad, 2004: 332).

In addition, the advantages of implementing modern agriculture are reducing production costs and producing high-quality harvests. Thus, the processing of agricultural land in a modern way is more profitable than the processing of agricultural land in a traditional way.

Therefore, the general picture of modern agriculture focuses on one type of plant, the planted commodities are specialized, where the implementation uses modern equipment and is supported by large capital. The modern agricultural system is currently often known as Good Agricultural Practice (Good Agricultural Practices).

**Welfare of Rice Farmers**

Material and spiritual well-being is the goal to be achieved in the development process (Hikmat, 2010). This shows that the success of development must be achieved not only in material aspects, but also in spiritual aspects. When a development process is only directed towards achieving material success, then it can be guaranteed that the desired community welfare cannot be achieved. People will feel a life that is empty and meaningless even though all facilities are available

Farmers are people who plant crops and then harvest them to sell or consume. Farmers must have knowledge about the plants they are planting to get a good harvest (Wijaya, 2019). Anyone can be a farmer, whether they own their own land or hire farm workers to work their land. Farmers are considered to be well-being if they have increasing income, less crop failure, increased productivity, and high rice prices. However, there are several factors that can hinder the well-being of farmers, including: (1) Cheap rice prices bought by middlemen; (2) Lack of government-subsidized fertilizer and seed supply; (3) Import of rice from neighboring countries; (4) Difficulties in obtaining loans for farmers (Sunarti, 2006).
RESEARCH METHODS

The research approach used in this study is a qualitative method. This method is chosen because it is considered to be more appropriate for describing the object and phenomenon being studied. The type of research is a field research, which is a research that is carried out in the field. The data collection technique used in this study is an interview. The respondents of this study are rice farmers in the village of Bojong Jaya, Pusakajaya District, Subang Regency. The results of this study are qualitative data, namely data in the form of descriptions that describe the facts about the use of good agricultural practices technology in improving the welfare of rice farmers.

RESULTS AND DISCUSSION

The Use of Good Agricultural Practices Technology in Bojongjaya Village

Good Agricultural Practices (GAP) or modern agriculture is known as specialized agriculture that describes an advanced level of agriculture. In modern agriculture, the main goal is maximum output from resources and maximization of commercial profits from farming. Two main characteristics of modern agriculture are commercialization and the use of state-of-the-art technology.

Based on interviews with farmers about the level of application of good agricultural practices technology, it is stated that the existence of modern GAP agricultural technology has led farmers to switch to using this technology. This requires farmers to use this technology so that they do not lag behind the changing times that change every year. However, at present, not all farmers can own and use modern agricultural machinery, because the cost required is more expensive and its use is quite difficult for farmers who have never used such modern equipment.

The Level of Application of Good Agricultural Practices Technology in Bojongjaya Village

Based on the results of the interviews with farmers regarding the use of GAP technology and how to use it in the field, such as selecting superior varieties of seeds, applying biofertilizers, nursery, applying biodecomposers, planting methods, weeding, irrigation, weeding, balanced fertilization, pest and disease control, and post-harvest, it is through attending agricultural extension from the Agricultural Extension Agency (BPP). GAP technology also shows that its use is worthy of implementation and is very worthy of development on a large scale, because the use of GAP technology has a significant impact on crop yields and farmers' income to meet their living needs. Although it was initially not easy to adapt from traditional to modern agriculture, but because they were willing to try and produce increased harvest income, farmers began to use it consistently.
In essence, the more advanced and modern technology, all agricultural activities will be much more developed and advanced. Productivity will increase resulting in various major benefits. By utilizing a technology, it is already certain that the level of productivity will be much higher compared to traditional agriculture, this is related to time and also results. By utilizing modern GAP agricultural technology, the planting process of plants on a large area can be completed in a short time. The maintenance pattern applied is also effective and efficient, and of course, such maintenance will provide abundant harvests.

The Use of Good Agricultural Practices Technology in Improving the Welfare of Rice Farmers in Bojongjaya Village

The use of Good Agricultural Practices (GAP) technology is very beneficial for the community, especially for those whose livelihood is as farmers. This agricultural technology plays an important role in producing high agricultural productivity and can meet all the needs of all levels of society, including food availability, personal needs, education costs, and health. In our lives so far, food products are a basic need that must always be met. This is because food is one of the factors that support every person to survive.

Based on the results of the interviews with rice farmers, the use of GAP technology has resulted in abundant harvests, as well as high-quality products. This agricultural technology can reduce the use of excessive water, fertilizers, and even pesticides. Excessive use of water, fertilizer, and pesticides will lower the quality of the products produced. With the benefits of GAP technology in agriculture, the possibility of this happening can be easily avoided.

In addition, the good quality of agricultural harvests will also provide high marketability. This means that farmers will earn more profits, and their welfare will be very guaranteed. According to (Rachmat, 2013), one indicator of farmer welfare is the ability of farmer income to meet the needs of farmer household expenses. Welfare improvement can be measured from the increase in the purchasing power of income to meet these expenses. The higher the purchasing power of farmer income against consumption needs, the higher the farmer's exchange value and relatively more prosperous.

In addition to the benefits, we also need to be wise in using agricultural technology. In other words, the technology we use should not damage the ecosystem or the surrounding environment, which can cause losses. For example, the technology applied should not produce waste that can pollute the environment. The benefits of GAP agricultural technology are enormous for farmers. We should also consider choosing environmentally friendly technology. This will ensure that our agricultural activities can continue and be sustainable.

CONCLUSION

Based on the results of the study conducted by the researcher, the following conclusions can be drawn (1) The use of Good Agricultural Practices (GAP) technology in Bojongjaya Village is a promising development that has the potential to improve the welfare of farmers. The technology is relatively easy to use and can be implemented on a large scale. The results of this study show that GAP technology can significantly increase crop yields and farmers' income. (2) Overall, the use of modern GAP agricultural technology has the potential to significantly improve the
productivity, quality, and sustainability of agriculture. However, there are also some challenges that need to be addressed in order to ensure that this technology is widely adopted by farmers. (3) The use of GAP technology has the potential to significantly improve the welfare of rice farmers. This technology can increase productivity, improve quality, and reduce costs. However, it is important to use GAP technology in a sustainable way that does not damage the environment.

Based on the results of the study conducted by the researcher, the following recommendations are made: (1) Farmers should increase the use of Good Agricultural Practices (GAP) technology. This can be done by sharing stories about the benefits of GAP technology with other farmers. Farmers should be encouraged to attend training and extension programs on GAP and Farmers should share their experiences with GAP with other farmers. (2) The government should provide more support for GAP programs for rice farmers. This could include funding for training and extension services. The government should provide funding for training and extension services for GAP. And The government should develop regulations and standards for GAP. (3) Future researchers should conduct studies on GAP for other crops and vegetables. This would help to expand the use of GAP technology in Indonesia. Researchers should conduct studies on GAP for other crops and vegetables and Researchers should study the economic and environmental impacts of GAP.

REFERENCE