



Science Applied in Agricultural Modernization and Poverty in Suburban Villages

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Abstract: Objective study This study examines agricultural modernization and poverty in peri-urban villages. The method used is qualitative, with a study field. As for participants in the study, this is one government official at the Makassar Agriculture Service. And a farmer in a village on the outskirts of Makassar City. Results study This conclude Agricultural modernization in suburban villages, especially around Makassar, has a very important impact on community welfare and economic growth in the region. The government, both at the provincial, city, and district levels, shows a commitment to supporting agriculture as the backbone of providing for the basic needs of citizens. Agricultural modernization, which involves the application of technology, skills training, and supportive policies, is the main solution to overcoming agricultural challenges in peri-urban villages.

Keywords : Agriculture; Modernization; Suburban villages

Introduction

Agricultural modernization in suburban villages is a strategic step that has a significant impact on food security and community welfare. Agriculture in this area plays a major role in supplying urban residents with basic necessities, making it a vital foundation for survival and economic development in many regions (Ingrao et al., 2023). Therefore, it is important to understand the dynamics, challenges, and opportunities faced by agriculture in suburban villages and design effective modernization strategies. Peri-urban villages often have unique characteristics, creating their own challenges in agricultural modernization efforts. First, the pressure of urbanization and changes in land use have resulted in a reduction in available agricultural land (Hou et al., 2021). Farming in rural villages must adapt to these changes, looking for ways to increase productivity within increasingly limited land constraints. In addition, the need to pay attention to environmental aspects, such as preserving water and land resources, is crucial in designing sustainable agricultural models (Dharmawan, 2007).

According to Saputro (2020), one approach that can be taken to modernize agriculture in suburban villages is the application of the latest agricultural technology. The use of information and communication technology, such as agricultural sensors, drones, and data management systems, can help farmers increase production efficiency and monitor crop conditions in real-time (Demestichas & Daskalakis, 2020). Apart from that, continued Prayoga et al. (2020) appropriate technology, such as smart irrigation and automatic land cultivation systems, can help overcome limited land constraints, increase productivity, and reduce environmental impacts. Apart from technology, developing skills and increasing farmer capacity are also key components of agricultural modernization. Training on modern agricultural practices, farm business management, and marketing of agricultural products can improve farmers' skills and knowledge. Strengthening agricultural cooperatives at the village level can also be a means of sharing resources, gaining access to larger markets, and increasing farmers' bargaining power in negotiating with related parties.

According to Purwanto & Alam (2020), the government, both local and national, has a very

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important role in supporting agricultural modernization in suburban villages. Policies that support investment in the agricultural sector, incentives for the use of agricultural technology, and the provision of adequate infrastructure can create a conducive environment for the growth of this sector. In addition, regulations that address land and environmental issues need to be implemented to maintain a balance between economic growth and environmental sustainability. Another aspect that needs to be considered in modernizing agriculture in suburban villages is the diversification of agricultural products. Apart from food crops, farmers can explore the potential of horticultural crops, livestock, and agrotourism. This diversification not only provides an additional source of income for farmers but also improves overall food security. The agrotourism development program, for example, could be an opportunity to double the function of agricultural land as a source of income while attracting tourists to get to know rural life more closely.

Agricultural modernization is not only related to technical and economic aspects but also to social and cultural aspects. Strengthening farmer identity, the sustainability of agricultural culture, and community participation in decision-making processes related to agriculture must be the focus. The involvement of local communities in the planning and implementation of modernization programs can ensure that the proposed solutions meet local needs and values. In an effort to create a sustainable agricultural ecosystem, it is important to pay attention to ecological principles and ecosystem balance. The use of pesticides and chemical fertilizers must be managed wisely to avoid negative impacts on the environment and human health. The implementation of integrated cropping patterns, sustainable management of natural resources, and other environmentally friendly agricultural practices need to be an integral part of agricultural modernization (Putra & Musafa, 2023).

No less important, according to Rangkuti (2010) is the development of local markets and the marketing of agricultural products. Creating efficient distribution channels and supporting local farmers can help them achieve better prices for their agricultural produce. Strengthening partnerships between local farmers, producers, and consumers can also create a sustainable economic environment. It is important to create a good communication network between the parties involved in the agricultural supply chain. In this way, information regarding market demand, consumer trends, and technological innovation can be accessed more quickly and accurately. Partnerships between the private sector, government, research institutions, and local

communities can be the key to success in facing changes and challenges in the world of agriculture.

The modernization of agriculture in suburban villages can also be seen as an opportunity to address the issue of gender inequality in the agricultural sector. Empowering women in agriculture through better access to education and training, as well as active participation in agricultural decisions, can make a positive contribution to overall agricultural development (Rifkian, 2017). Involving the younger generation in agriculture is also important to ensure the sustainability of this sector. Education and training programs that support young people's interest in and involvement in agriculture need to be encouraged. Forming youth agricultural groups, providing facilities and financial support, and promoting sustainable agricultural lifestyles can be strategic steps in strengthening the role of the younger generation in stimulating the agricultural sector.

Susiati (2022) explains that the challenges that need to be overcome in modernizing agriculture in suburban villages are not only technical and economic but also involve policy, social, and cultural aspects. Coordination between various stakeholders, including the government, research institutions, the private sector, and local communities, is the key to success in dealing with these complex dynamics. In the context of globalization, suburban villages can also take advantage of international trade opportunities. Increasing international market access can help increase farmer incomes and diversify the village economy. However, while taking advantage of this opportunity, it is necessary to remember to maintain a balance between exports and local needs so that there is no excessive dependence on international markets.

Environmental preservation in agricultural modernization should not be ignored. Suburban villages often have biodiversity that needs to be preserved. Sustainable land management, forest preservation, and organic farming practices can be important steps in preserving local ecosystems. Innovation in the use of renewable energy and environmentally friendly technology also needs to be encouraged to reduce negative impacts on the environment. In the context of global warming and climate change, agriculture in suburban villages must also be prepared to face challenges related to climate uncertainty. Agricultural systems that are adaptive and resistant to weather changes need to be developed. Implementing environmentally friendly agricultural practices, such as water conservation and good soil management, can help reduce the impact of climate change (Syarif, 2018).

Tahir et al. (2019) explain building synergies between agriculture and other sectors in the suburban

village economy. Linkages between agriculture and the processing industry, tourism, and other service sectors can create a more complete and sustainable value chain. Local economic development initiatives, such as empowering micro and small businesses, can also help reduce economic inequality in rural communities. The importance of a holistic approach to modernizing agriculture in suburban villages cannot be denied. Apart from technical and economic aspects, it is also necessary to pay attention to social, cultural, and environmental aspects. Empowering local communities, preserving agricultural culture, and wisely managing natural resources must be integral parts of the modernization strategy.

In facing various challenges and complexities in agricultural modernization in suburban villages, collaboration between all parties involved is the key to success. The government, society, private sector, and research institutions need to work together synergistically to create an environment that supports sustainable and competitive agricultural development. Through this joint effort, it is hoped that suburban villages can become centers of sustainable economic growth, maintain environmental sustainability, and make a significant contribution to national food security and overall community welfare. When a suburban village successfully transforms into an economic center, a significant positive impact that can be observed is a reduction in poverty levels in the area. This transformation brings a number of economic, social, and environmental benefits that directly or indirectly contribute to improving the welfare of local communities (Wahyudin et al., 2023).

First of all, a shift in economic focus from traditional agriculture towards more diverse economic sectors can create new jobs and business opportunities for local residents. With the development of the industrial, trade, tourism, and other service sectors, rural communities on the outskirts of cities have wider access to jobs with better income levels. This increase in job opportunities can directly reduce the unemployment rate and improve people's living standards. Furthermore, economic growth that occurs in suburban villages can open the door to innovation and increased productivity. The existence of an economic center can create an environment that supports the development of business, technology, and education. This can stimulate improvements in workforce qualifications, provide better educational opportunities, and encourage the adoption of modern technology in various economic sectors. Over time, this will create a positive cycle where society can be more adaptive to global economic changes.

Poverty reduction can also be achieved through increased access and an equal distribution of income. With sustainable economic growth, opportunities to increase people's income become more open. Equal distribution of income through policies that support economic inclusiveness can help reduce social disparities and provide greater access for all levels of society to the resulting economic benefits. Apart from that, developing economic centers in suburban villages can create a business ecosystem that supports micro, small, and medium enterprises (MSMEs). MSMEs have an important role in driving the wheels of the local economy and providing jobs for many people. By providing support to MSMEs, whether in terms of training, access to capital, or marketing, village communities can more easily access larger markets, increase the competitiveness of local products, and reduce dependence on the agricultural sector.

(Arista, 2017) explains that reducing poverty is not only about increasing income but is also related to increasing access to basic services. Economic centers in suburban villages can be catalysts for providing basic infrastructure such as education, health, sanitation, and transportation. With increased investment in this infrastructure, people can access better services, thereby improving their quality of life and overall well-being. The development of the tourism sector can also be an important factor in reducing poverty. If a suburban village has attractive potential, whether in terms of nature, culture, or history, tourism development can create an additional source of income for the local community. Through the promotion of sustainable tourism, communities can gain direct and indirect economic benefits, such as increasing demand for local products and tourism support services.

However, Togatorop & Basri (2017) explain that the process of reducing poverty through developing economic centers does not always run without obstacles. Economic change can create inequality and exclusion, especially if there are no policies in place to ensure that economic benefits are distributed fairly. Therefore, local governments must ensure that there are inclusive policies that involve the participation of all levels of society in the economic development process. Skills training and education programs also need to be improved to increase the competitiveness of local workers in the ever-growing job market. As people's skills and knowledge increase, they can more easily adapt to economic changes and benefit from emerging opportunities.

In facing economic changes, environmental sustainability must also remain a primary concern. The development of economic centers in suburban villages must be carried out by paying attention to

environmentally friendly principles and preserving natural resources. Policies that support sustainable agriculture, good waste management, and protection of the local natural environment need to be integrated into economic development plans. In this way, when a suburban village succeeds in becoming an economic center, not only will there be an increase in economic income, but it will also create a uniform positive impact on reducing poverty levels. This success will provide additional impetus for sustainable development and create an environment conducive to the well-being of local communities. Through joint efforts and targeted policies, suburban villages can become an example for alleviating poverty through sustainable economic development.

Method

Method of research used in the study This is a method study qualitative with a type study in which the field is wrong. One general approach is used in the study. Method This aim is to understand moderate phenomena researched from the perspective of participant or subject research, with a focus on meaning, interpretation, and context social (Iswadi et al., 2023). In the qualitative study field, researchers are involved directly in the situation field, like observing, interviewing, or interacting with participants. Research data, which researchers collect in a direct way from the source, is good through observation, direct interview, in-depth , note field, or audio/video recording. The data obtained is then analyzed in a deep and interpreted way to disclose patterns, themes, or the meaning that emerges. As for steps in studying this, among others.

Observation participatory: researcher involved in a direct way in situation field, observing and taking notes relevant information about context, behavior, and social interaction (Mulhall, 2003). Identification problem research: The researcher determines the topic, study, and identification problem or question of the research you want to answer. Researchers explain an objective study in a clear and specific way. Study library: researcher does review References for understanding the study were previously relevant to the topic study. With scientific journals, books, articles, and sources I trusted others to obtain a good understanding of the subject study.

Design research: researchers make appropriate research with an objective and question study. Researchers determine the method of research to be used, like a survey, observation, interview, experiment, or combination of these methods. Furthermore, the researcher compiles a list of instruments and techniques that will be used to collect data in the study. This

researcher uses observation and interviews to collect research data. Interview in depth: Researchers do interview structured participant research to obtain a deeper understanding of their perspective, experience, and interpretation of the phenomenon under study. This researcher observed and interviewed each of the two agricultural policymakers and farmers. Analysis: After finishing collecting data, researchers do data analysis for answer-question research and use qualitative method analysis. Interpretation Result: After analyzing the data, researchers interpret the results of the study. Identification findings are main, and connect them back to the question study. Then explain the implications and findings, and an intriguing logical conclusion.

Results and Discussion

The results of research conducted in October–November 2023 in a village on the outskirts of Makassar city provide an interesting picture regarding the efforts of the provincial, city, and district governments to advance the agricultural sector, especially its role as a support provider of basic needs for residents. An interview with a representative from the Makassar City Agriculture Service provided a deeper understanding of the concrete efforts that have been made. Based on observations and interviews with officials from the Department of Agriculture, it can be concluded that the government at the provincial, city, and district levels is focusing and concentrating on developing the agricultural sector. This shows awareness of the important role of agriculture as the main support for providing basic needs for residents, especially in suburban areas of Makassar. One important finding is the existence of synergistic efforts between provincial, city, and district governments to support agriculture. This coordination is key to creating sustainability and efficiency in the development of the agricultural sector. This integrated approach includes aspects of policy, financing, and technical support provided to farmers (Qiu et al., 2021).

From interviews with Agriculture Service officials, it was revealed that the government has launched various programs and policies to increase farmer productivity and welfare. These programs involve various sectors, ranging from agricultural education and skills training to technology assistance. This assistance is not only aimed at increasing agricultural yields but also to ensure that farmers have sufficient knowledge and skills to face the challenges of agricultural modernization (Duncan et al., 2021). In addition, there appears to be special attention given to the development of sustainable agriculture. The government seems to understand the importance of preserving the

environment and balancing the ecosystem in the long term. Therefore, implementing environmentally friendly and sustainable agricultural practices is one of the main focuses. This includes the use of organic fertilizers, efficient irrigation systems, and agricultural waste management (Aroonsrimorakot et al., 2021; Koul et al., 2022).

The government's involvement in advancing agriculture is also reflected in the wise management of natural resources. Through various policies, the government seeks to address issues related to land use, land ownership rights, and the protection of agricultural land. It is hoped that this support will provide certainty and motivation for farmers to continue investing in developing their agricultural businesses. On the other hand, the results of an interview with a farmer provide a perspective from the field. Farmers interviewed said that support and assistance from the government had helped them increase productivity and welfare. Agricultural training and education programs are appreciated as they provide a better understanding of modern and efficient farming techniques (Shariff et al., 2022).

Farmers also emphasized the significance of the government's role in creating a favorable environment for agriculture. The existence of clear regulations and infrastructure support are crucial factors in increasing the competitiveness of local agriculture. The availability of market access and other supporting facilities, such as distribution centers and storage facilities, determines the success of marketing agricultural products. The understanding obtained from interviews with two different parties, namely the agricultural service and farmers, shows that there is positive synergy in agricultural development efforts in villages on the outskirts of Makassar city. Joint efforts between the government and farmers are the key to success in realizing sustainable and competitive agriculture (Velten et al., 2021).

Furthermore, this research provides a basis for recommending more specific and targeted policy steps. There needs to be continuous monitoring and evaluation of the implementation of agricultural programs that have been launched to ensure sustainable positive impacts. In addition, hearing the direct voices of farmers can be a source of inspiration for adjusting policies to make them more relevant and effective at the field level. Thus, the results of this research provide a holistic picture of agricultural development efforts in villages on the outskirts of Makassar city, including perspectives from the government and the main actors in this sector, namely farmers. By continuing to strengthen collaboration between various related parties, it is hoped that this suburban village can continue to develop as a

center for sustainable economic growth and make a real contribution to providing basic needs for residents.

It should be noted that the continuation of these findings reveals that when the agricultural sector successfully advances, the impact is directly felt in improving the welfare of farmers, and this phenomenon has a close correlation with economic growth in the region. First of all, increasing productivity and efficiency in the agricultural sector creates greater income opportunities for farmers. With the implementation of modern agricultural technology, efficient farming practices, and better access to markets, farmers can optimize their crop yields. This has a positive impact on farmers' income, enabling them to achieve better levels of prosperity. Apart from that, diversification of agricultural businesses can also contribute to improving farmer welfare. By combining food crops, horticulture, livestock, or agrotourism, farmers can create a more stable and diverse business portfolio. This not only reduces financial risks but also provides opportunities to earn additional income through different sectors.

The correlation between the advancement of the agricultural sector, increased welfare of farmers, and economic growth is also visible in the dynamics of local markets. Increased agricultural production creates larger markets, drives local economic growth, and creates additional jobs. It should be noted that economic growth in the agricultural sector not only has an impact on farmers but also on related sectors, such as the food processing industry, distribution, and agricultural support services (Rifkian, 2017).

Empowering farmers through training and education is also a key factor in increasing welfare (Efrina, 2022; Pandey et al., 2024). By improving farmers' knowledge and skills, they can more effectively manage their agricultural businesses, adopt modern practices, and participate actively in local economic activities. This empowerment not only creates economic prosperity but also gives farmers a sense of self-confidence and self-esteem. In this context, infrastructure support also plays an important role. Better access to transportation networks, storage facilities, and distribution centers can help farmers market their products more efficiently. Good infrastructure creates an environment that supports economic growth at various levels, making a positive contribution to the welfare of farmers and local communities.

Farmers' welfare is not only measured in terms of income but also involves other aspects, such as access to education, health, and adequate housing (Kaluwa et al., 2022). Increasing income from the agricultural sector can provide farmers with the opportunity to improve their overall quality of life. Therefore, agricultural

sustainability that supports farmer welfare needs to be integrated into the planning and implementation of development policies. It is also necessary to consider the challenges and risks that farmers may face on their journey towards better prosperity. Fluctuations in agricultural commodity prices, climate change, and vulnerability to natural disasters can be factors that influence farmers' economic stability. Therefore, policy strategies that can increase farmers' resilience to these risks also need to be considered.

In order to improve farmer welfare, it is necessary to apply a sustainable and inclusive approach. Policy measures that support the empowerment of women in agriculture, the fulfillment of farmers' land rights, and the protection of small farmers need to be strengthened. By ensuring that all levels of farming society can share in the benefits of economic growth, sustainable prosperity can be more assured.

Conclusion

Based on findings and discussion in a way overall, research gives the conclusion from the explanation above shows that agricultural modernization in suburban villages, especially around Makassar, has a very important impact on community welfare and economic growth in the region. The government, both at the provincial, city, and district levels, shows a commitment to supporting agriculture as the backbone of providing for the basic needs of citizens. Agricultural modernization, which involves the application of technology, skills training, and supportive policies, is the main solution to overcoming agricultural challenges in peri-urban villages. Empowering farmers through access to new knowledge, technology, and government support creates an environment that supports increasing farmer productivity and welfare. With the development of the agricultural sector, there is an increase in farmers' income, which has a positive impact on improving their welfare. Diversification of agricultural businesses, environmental sustainability, and empowering women in agriculture are the main focuses of creating sustainable and inclusive agriculture.

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