CHAPTER V. CONCLUSIONS AND IMPLICATIONS

A. Conclusions

Based on the results obtained from this study, it can be concluded that:

1. The harvested area (HA) exhibits a positive and significant effect on Rice Production during the 2020–2024 period. This result indicates that an increase in harvested land directly contributes to higher rice output. Land remains the primary production factor in the agricultural sector, as it determines production capacity and output levels. The significant coefficient reflects that expanding harvested area is still an effective strategy to increase rice production in Indonesia. Therefore, policies aimed at protecting agricultural land from conversion and optimizing land utilization are essential to maintain sustainable rice production growth.
2. The agricultural labor (AL) shows a significant negative effect on rice production during the 2020–2024 period. This finding suggests that an increase in the number of agricultural workers has not necessarily improved rice output. This tendency may reflect inefficiencies, low labor productivity, or the presence of diminishing returns in labor-intensive farming systems. The result implies that improving labor quality, skills, and technological adoption is more important than merely increasing the quantity of labor in supporting higher rice production.
3. The Farm Microcredit (MC) has a positive and significant effect on rice production during the 2020–2024 period. This finding indicates that a higher

number of farmers receiving microcredit enables greater access to essential production inputs such as seeds, fertilizers, and agricultural equipment, thereby increasing output levels. The significant relationship reflects the importance of financial access in strengthening agricultural productivity. Hence, expanding the coverage of farmers' microcredit programs plays a strategic role in enhancing rice production performance.

4. The Farmer's Terms of Trade (FTT) has no significant effect on Rice Production during the 2020–2024 period. This result suggests that improvements in farmers' purchasing power and relative prices do not automatically translate into higher production levels. Structural constraints such as limited land, production capacity, and technological factors may restrict farmers' ability to respond to price incentives. Therefore, price improvements alone are insufficient to stimulate a significant increase in rice production without being supported by improvements in other production factors.
5. The Infrastructure (INF), proxied by road length, shows statistically insignificant effect on Rice Production during the 2020–2024 period. This finding indicates that the expansion of road infrastructure has not directly contributed to increasing rice output. The increase in road length may not necessarily reflect improvements in infrastructure quality, accessibility to production centers, or efficiency in input and output distribution. Thus, infrastructure development that is not specifically aligned with agricultural

production needs may not significantly enhance rice production performance.

6. The results indicate that infrastructure significantly moderates the relationship between agricultural labor and rice production, while it does not significantly moderate the relationships between harvested area, farm microcredit, and Farmer's Terms of Trade with rice production. This suggests that infrastructure plays a selective role in strengthening labor effectiveness in agricultural activities. However, overall, infrastructure has not functioned as a comprehensive moderating factor in enhancing the effect of key production variables on rice output.

B. Implication

1. The government needs to strengthen policies aimed at protecting and optimizing agricultural land to sustain rice production growth. The control of land conversion from productive rice fields to non-agricultural purposes must be enforced more strictly through spatial planning regulations and sustainable agricultural land protection policies. In addition, programs that promote land intensification, irrigation rehabilitation, and the optimization of multiple cropping systems should be expanded to maximize output from existing land resources. A well-managed land policy provides certainty regarding production capacity and supports long-term national food security. In the long run, consistent land protection accompanied by improvements in farming practices can become a strategic instrument to maintain stable rice production and reduce dependency on imports.

2. Local and central governments need to shift their focus from increasing the quantity of agricultural labor to improving its quality and productivity. Training programs, agricultural extension services, and the adoption of modern farming technologies should be intensified to enhance farmers' technical and managerial capabilities. Mechanization and digital agriculture initiatives can also help address inefficiencies associated with surplus labor in rural areas. Strengthening human capital in agriculture ensures that labor contributes effectively to production rather than creating diminishing returns. In the long term, productivity-based agricultural development will improve farm competitiveness and support sustainable production growth.
3. The expansion of access to farmers' microcredit should be maintained and improved to support agricultural productivity. Credit distribution mechanisms must be simplified while ensuring that financing is allocated to productive activities such as purchasing high-quality seeds, fertilizers, machinery, and post-harvest equipment. Strengthening supervision and financial literacy programs is essential to ensure that loans are used efficiently and responsibly. Collaboration between financial institutions, agricultural agencies, and farmer groups can enhance the effectiveness of credit programs. In the long term, inclusive and well-targeted agricultural financing can serve as a strategic instrument to strengthen production capacity, increase farmers' income, and improve overall agricultural resilience.

4. Infrastructure development policies should prioritize quality improvement and connectivity to agricultural production centers rather than merely expanding road length. Maintaining road conditions, improving rural accessibility, and ensuring efficient logistics networks are crucial to enhancing labor effectiveness in agricultural activities. Integrated rural infrastructure planning covering roads, irrigation systems, storage facilities, and market access—can significantly improve the productivity of agricultural labor. Strengthening coordination between central and local governments in infrastructure planning is essential to align development priorities with agricultural needs. In the long run, high-quality infrastructure that directly supports farming activities will enhance production efficiency, reduce distribution costs, and contribute to sustainable rice production growth.

C. Research Limitations

This study has several limitations that should be considered in interpreting the results. The analysis relies entirely on secondary data sourced from Statistics Indonesia (BPS), which limits control over data measurement, revisions, and regional consistency. In addition, infrastructure is proxied only by road length, which does not fully capture infrastructure quality, accessibility, logistics efficiency, or complementary facilities such as irrigation and storage. Consequently, the moderating role of infrastructure may not comprehensively reflect its actual contribution to rice production.

The use of annual panel data for the 2020–2024 period also restricts the ability to capture seasonal variations and short-term shocks, including floods, droughts, and pest outbreaks that significantly affect agricultural output. The relatively short observation period may further limit the identification of long-term structural changes in productivity and policy impacts. Therefore, future research is encouraged to incorporate climate variables, infrastructure quality indicators, and spatial data to provide more comprehensive and accurate analysis. Extending the time horizon and utilizing micro-level data would enhance the robustness of the findings. Hence, the results of this study should be interpreted as representing general relationships among variables within the observed period.