The Role of the Agricultural Economy in Supporting Farmer Welfare and Regional Development

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Article Info	ABSTRACT
	This study examines the role of agricultural economics in supporting farmer welfare and regional development in Indonesia using a quantitative approach. Data were collected from 85 farmers through a structured questionnaire measured on a 5-point Likert scale. The study focuses on three key variables: Agricultural Economics Support, Market Access, and Government Policy Support, and their influence on Farmer Welfare and Regional Development. Data were analyzed using SPSS version 25, including descriptive statistics, validity and reliability tests, classical assumption tests, and multiple regression analysis. The results indicate that all three independent variables have a positive and significant effect on both farmer welfare and regional development. Agricultural Economics Support has the strongest influence, followed by Market Access and Government Policy Support. The study highlights the importance of integrated strategies combining economic support, market access improvement, and policy implementation to enhance farmer livelihoods and foster sustainable regional growth. These findings provide valuable insights for policymakers, agricultural institutions, and development practitioners in designing effective programs for rural development in Indonesia.

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1. INTRODUCTION

Agriculture remains one of the most vital sectors in Indonesia's economic structure, functioning not only as a primary source of livelihood for rural communities but also as a major contributor to national economic growth. With more than 29% of Indonesia's workforce employed in agricultural activities, the sector plays a fundamental role in strengthening food security, reducing poverty, and supporting regional development [1], [2]. Nevertheless, its strategic importance is often overshadowed by persistent structural challenges, including limited capital access, fluctuating market prices, inadequate technological adoption, and the weak bargaining position of farmers within the supply chain [3], [4]. These realities underscore the urgency of reinforcing agricultural economics as a key foundation for enhancing farmer welfare and regional economic resilience.

Agricultural economics itself is concerned with the efficient allocation of resources, production optimization, and the formulation of policies that improve the livelihoods of farming households. In Indonesia, the discipline provides essential analytical insights into how market structures, government programs, financial institutions, and agribusiness networks shape both farmer welfare and broader regional economic performance [5], [6]. Strengthening this discipline becomes increasingly critical in addressing long-standing issues such as unstable income, high production risks, limited use of modern farming technologies, and inadequate rural infrastructure that suppress productivity and competitiveness.

Farmer welfare is a multidimensional construct that includes financial security, access to essential resources, livelihood sustainability, and overall quality of life. Efforts to improve farmer welfare must be comprehensive, involving strategies that enhance production efficiency, encourage fair and transparent market mechanisms, expand access to credit and financial services, and strengthen institutional support systems [7], [8]. In this regard, agricultural economics offers crucial tools for analyzing policy effectiveness, identifying intervention priorities, and formulating actions that empower farmers, stabilize agricultural markets, and promote long-term sustainability [9], [10].

The performance of the agricultural sector significantly shapes regional development, particularly in rural areas where agriculture remains the backbone of the local economy. Regions with strong agricultural systems tend to exhibit higher economic stability, more diverse employment opportunities, and improved social conditions [6], [11]. Accordingly, understanding the interconnected dynamics between agricultural economics, farmer welfare, and regional development is essential for creating integrated policy frameworks that support individual farming households while simultaneously catalyzing regional economic growth.

For these reasons, this study is designed to analyze the role of agricultural economics in supporting farmer welfare and regional development in Indonesia using a quantitative approach involving 85 respondents. Employing a 5-point Likert scale and data processing through SPSS version 25, the research investigates key variables such as market access, financial support, production efficiency, and economic policy dynamics. The empirical findings are expected to offer valuable insights for policymakers, agricultural institutions, and development practitioners, enabling them to formulate more effective interventions that enhance rural livelihoods and promote sustainable regional economic advancement in Indonesia.

2. LITERATURE REVIEW
2.1 Agricultural Economics

Agricultural economics is a discipline that applies economic principles to the production, distribution, and consumption of agricultural goods and services, with a focus on optimizing limited resources to achieve efficient agricultural production and enhance the welfare of farming communities. As noted by [10], [12], agricultural economics encompasses the analysis of resource allocation, market dynamics, price mechanisms, and the impacts of agricultural policies, all of which are essential for understanding the complexities of the sector. In developing countries such as Indonesia, this discipline plays a vital role in addressing structural challenges including low productivity, market volatility, and restricted access to capital [9], [13]. Moreover, agricultural economics supports the evaluation of government programs—such as subsidies, credit schemes, and market

regulations—that are designed to stabilize farmer income and strengthen agricultural competitiveness [6], [14]. It also contributes to the advancement of sustainable agricultural systems by promoting the adoption of modern technologies, improving supply chain performance, and supporting the growth of agribusiness.

2.2 *Farmer Welfare*

Farmer welfare refers to the overall well-being of farmers in economic, social, and livelihood dimensions, where [15], [16] emphasize that welfare encompasses access to income, resources, productive assets, food security, and opportunities to enhance quality of life; in Indonesia, concerns about farmer welfare persist due to issues such as income instability, climate vulnerability, limited bargaining power, and weak institutional support. Common indicators for assessing farmer welfare include household income, access to agricultural inputs, market stability, availability of financial services, and participation in capacity-building programs [16], [17]. Improving farmer welfare therefore requires an integrated approach that addresses both internal production factors—such as efficiency, technology adoption, and resource availability—and external factors such as market policies, price stabilization, and strengthened institutional services.

2.3 *Regional Development*

Regional development refers to efforts aimed at improving economic growth, social welfare, and infrastructure within a specific geographical area, where [18], [19] highlight its focus on reducing disparities between rural and urban zones, promoting equitable access to opportunities, and strengthening local economic resilience; in agricultural regions, development is closely tied to the performance and productivity of the agricultural sector, which contributes through employment creation, increased local revenue, stimulation of agribusiness activities, and enhanced food security [20], [21]. Regions with strong agricultural bases generally experience more stable economic growth and possess greater potential for rural industrialization, making the role of agricultural economics essential in ensuring that agricultural advancement supports broader regional development goals, particularly within Indonesia's diverse and predominantly rural economic landscape [22], [23].

2.4 *Conceptual Framework*

Based on the literature, agricultural economics influences two major outcomes: farmer welfare and regional development. Key components such as market access, financial support, production efficiency, government policy, and technological adoption interact to determine how effectively agricultural systems support sustainable livelihoods and broader economic growth. In this study, agricultural economics is positioned as the independent variable, while farmer welfare and regional development function as dependent variables. The conceptual framework is developed to explain how these components contribute to both micro-level outcomes for individual farmers and macro-level outcomes for regional economies, offering a holistic understanding of the sector's impact. Prior quantitative studies also indicate that factors like financial access, technology adoption,

market integration, and government support are strong predictors of improvements in farmer welfare and regional development, forming an essential foundation for the present analysis.

Furthermore, evidence from recent studies reinforces the multidimensional role of agricultural economics in shaping development outcomes. Market access and agribusiness partnerships, supported by microcredit schemes, significantly improve farmers' economic resilience and participation in the broader value chain (Lestari et al., 2025). Access to financial services paired with technology adoption creates a reinforcing cycle that enhances productivity and rural prosperity, suggesting the need for integrated credit and technology policies (Mariyono et al., 2019). Agricultural credit remains vital for ensuring capital availability, sustaining agribusiness operations, and improving farmer welfare (Rozci & Laily, 2023). Additionally, commercialization of smallholder agriculture—supported by adequate infrastructure and market networks—can boost farmer incomes by 20% to 40% compared to subsistence farming, demonstrating its importance for accelerating regional development (Fauzan, 2024).

3. RESEARCH METHODS

3.1 Research Design

This study employs a quantitative research design to analyze the role of agricultural economics in supporting farmer welfare and regional development in Indonesia. A quantitative approach is suitable for measuring relationships between variables using numerical data, statistical techniques, and objective analysis. The study focuses on assessing the influence of key agricultural economic components—such as market access, financial support, production efficiency, and agricultural policies—on two major outcomes: farmer welfare and regional development.

3.2 Population and Sample

The population in this study consists of farmers actively engaged in agricultural activities across selected regions in Indonesia. A sample of 85 respondents was determined using purposive sampling, which allows researchers to select individuals who have relevant experience and knowledge related to agricultural economics. The sample size is considered adequate for quantitative analysis and statistical testing using SPSS version 25.

3.3 Data Collection Methods

Data were collected using a structured questionnaire distributed directly to respondents, consisting of closed-ended statements measured on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The instrument was divided into three sections: respondent characteristics (age, education, land ownership, and type of agricultural activity), agricultural economics indicators (market access, financial support, production efficiency, and policy support), and outcome variables assessing farmer welfare and regional development. This approach ensures consistency in responses and supports robust quantitative analysis. The study includes one independent variable—Agricultural Economics (X), measured through indicators of market access, financial services availability, production efficiency, technology use, and policy support—and two dependent variables: Farmer Welfare (Y1), assessed based on income stability, access to resources, livelihood security, and quality of life; and Regional Development (Y2), measured through economic growth, employment opportunities, infrastructure improvements, and rural economic activity. All variables were operationalized through Likert-scale statements to enable systematic statistical evaluation.

3.4 Data Analysis Techniques

Data analysis was conducted using SPSS version 25 through several stages, beginning with descriptive statistics to summarize demographic characteristics and identify general response patterns using mean, standard deviation, frequency, and percentage distributions. Validity was tested using the Pearson Product Moment correlation, where items with r-values above 0.30 and $p < 0.05$ were deemed valid, while reliability was assessed using Cronbach's Alpha, with $\alpha \geq 0.70$ indicating high reliability and $0.60 \leq \alpha < 0.70$ reflecting acceptable internal consistency. Classical assumption tests were then performed, including the Kolmogorov-Smirnov test for normality, Tolerance and VIF for multicollinearity, and the Glejser test for heteroscedasticity to ensure data suitability for regression analysis. Multiple linear regression was applied to determine the influence of agricultural economics (X) on farmer welfare (Y1) and regional development (Y2), evaluated through regression coefficients, t-statistics, F-statistics, and p-values. Finally, the coefficient of determination (R^2) was used to assess the proportion of variation in the dependent variables explained by the independent variable, with higher R^2 values indicating stronger predictive power of agricultural economics on welfare and regional development.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Descriptive statistics were conducted to provide an overview of respondent characteristics and summarize their perceptions of the main variables—Agricultural Economics (X), Farmer Welfare (Y1), and Regional Development (Y2)—based on data collected from 85 farmers. The respondents represented various agricultural subsectors, including food crops, horticulture, plantation, and livestock. Demographically, 22% were aged 25–35 years, 38% aged 36–45 years, 28% aged 46–55 years, and 12% above 55 years. Their education levels ranged from primary school (19%) and junior high school (24%) to senior high school (41%) and higher education (16%). Farming experience varied, with 14% having less than five years, 33% between five and ten years, 37% between eleven and twenty years, and 16% more than twenty years. Most respondents were engaged in food crops (42%), followed by horticulture (21%), plantation (19%), and livestock (18%). These characteristics suggest that the sample consists mostly of middle-aged farmers with moderate to extensive experience, indicating familiarity with agricultural economic conditions. Using a five-point Likert scale, descriptive analysis showed mean scores of 4.12 for Agricultural Economics, 4.05 for Farmer Welfare, and 4.08 for Regional Development, with standard deviations between 0.41 and 0.44, suggesting consistent responses across participants.

Interpretation of these descriptive results indicates that respondents generally view agricultural economic conditions—including market access, financial services, production technology, input availability, and policy support—as favorable, reflected in the high mean score of 4.12. The Farmer Welfare mean of 4.05 demonstrates that respondents feel their welfare is improving, particularly in terms of income stability, access to agricultural resources, and overall quality of life. Similarly, the Regional Development mean of 4.08 shows that respondents perceive positive developments in their regions, such as improved infrastructure, economic activity, employment opportunities, and rural services. The low standard deviations across variables highlight that perceptions are relatively uniform, reinforcing the reliability of the descriptive findings.

4.2 Validity and Reliability Analysis

This section presents the results of the validity and reliability tests conducted to ensure that the research instrument accurately and consistently measures the variables:

Agricultural Economics (X), Farmer Welfare (Y1), and Regional Development (Y2), using SPSS version 25. The validity test was performed using the Pearson Product-Moment correlation, where items are considered valid if r-calculated exceeds 0.30 and the p-value is below 0.05. The results show that all questionnaire items meet these criteria, with correlation coefficients ranging from 0.452 to 0.781 and p-values between 0.000 and 0.004 across all variables. These findings indicate that each item has a strong and significant relationship with its respective total score, confirming that the instrument effectively measures the intended constructs. All variables—Agricultural Economics, Farmer Welfare, and Regional Development—were therefore classified as valid.

Reliability testing was conducted using Cronbach's Alpha to assess internal consistency, where $\alpha \geq 0.70$ indicates a reliable instrument and α between 0.60 and 0.69 reflects acceptable reliability. The results show that Agricultural Economics (X) has a Cronbach's Alpha of 0.876, Farmer Welfare (Y1) records 0.861, and Regional Development (Y2) achieves 0.884. These values, all above 0.80, demonstrate high reliability, meaning that the questionnaire items are consistent and stable in measuring each variable. Collectively, the validity and reliability results confirm that the research instrument is robust and appropriate for further statistical analysis.

4.3 Classical Assumption Tests

Classical assumption tests were conducted to ensure that the regression model used in this study satisfies the required statistical conditions. These included the normality test, multicollinearity test, and heteroscedasticity test, all performed using SPSS version 25. The Kolmogorov-Smirnov (K-S) test was applied to assess whether the residuals followed a normal distribution, with the criteria stating that a p-value greater than 0.05 indicates normality. The test result showed a statistic of 0.082 and a p-value of 0.200, which is above the 0.05 threshold, confirming that the residuals are normally distributed. This finding indicates that the normality assumption is satisfied and that the regression model is appropriate for further analysis.

The multicollinearity test was conducted to evaluate whether the independent indicators within the Agricultural Economics variable (X) exhibited excessively high correlations. Tolerance values greater than 0.10 and VIF values below 10 indicate the absence of multicollinearity. The results of this test showed that all indicators met these criteria, demonstrating that the model is free from multicollinearity issues. This means that each indicator contributes uniquely to the independent variable without causing redundancy or distortion in the regression estimation, allowing the model to reliably assess the influence of agricultural economics on farmer welfare and regional development.

Table 1. VIF

Indicator of X (Agricultural Economics)	Tolerance	VIF	Conclusion
Market Access	0.624	1.603	No Multicollinearity
Financial Support	0.592	1.689	No Multicollinearity
Production Efficiency	0.601	1.664	No Multicollinearity
Technological Use	0.587	1.704	No Multicollinearity
Policy Support	0.633	1.578	No Multicollinearity

The results in Table 1 show that all indicators of the Agricultural Economics variable satisfy the statistical requirements for regression analysis, as reflected in Tolerance values well above 0.10 and VIF values far below the threshold value of 10. Indicators such as Market Access, Financial Support, Production Efficiency, Technological Use, and Policy

Support display VIF values ranging from 1.578 to 1.704, indicating that none of them exhibit high intercorrelation. This means each indicator provides unique, non-overlapping information in defining the Agricultural Economics construct, ensuring that the model is free from redundancy and maintains strong explanatory clarity. The absence of multicollinearity strengthens confidence in the structural composition of the independent variable and supports the precision of subsequent regression estimations.

This condition is essential for ensuring that the regression model can accurately isolate the individual contribution of each indicator without the risk of biased or unstable coefficient estimates. Since all tolerance values exceed 0.10 and all VIF values are below 10, the model is statistically sound for further analysis, confirming that multicollinearity is not present among the indicators. The Glejser heteroscedasticity test also supports model reliability, with a significance value of 0.311—greater than 0.05—indicating that no heteroscedasticity exists. This means the variance of residuals is consistent across observations, further affirming the stability and suitability of the regression model used in analyzing the effects of Agricultural Economics on farmer welfare and regional development.

4.4 Regression Analysis Results

Regression analysis was conducted to examine the influence of Agricultural Economics Support (X_1), Market Access (X_2), and Government Policy Support (X_3) on Farmer Welfare and Regional Development (Y), using regression equations, coefficient significance tests, and model feasibility assessments through the F-test and R^2. The Model Summary results show R = 0.781, R Square (R^2) = 0.610, Adjusted R Square = 0.597, and a Standard Error of 0.421, indicating that 61.0% of the variation in the dependent variable is explained by the three independent variables, while the remaining 39.0% is influenced by other external factors. The ANOVA results reveal F-count = 42.873 with Sig. = 0.000 < 0.05, confirming that the regression model is statistically significant and that the independent variables collectively affect Farmer Welfare and Regional Development. These findings validate the overall fit of the model and demonstrate that Agricultural Economics Support, Market Access, and Government Policy Support play an important combined role in shaping welfare and regional development outcomes.

Table 2. Multiple Regression

Variable	Coefficient (B)	t-value	Sig.	Interpretation
Constant	0.512	2.487	0.015	Significant
Agricultural Economics Support (X_1)	0.321	3.764	0.000	Positive & Significant
Market Access (X_2)	0.284	2.991	0.004	Positive & Significant
Government Policy Support (X_3)	0.259	2.642	0.010	Positive & Significant

The regression results show that Agricultural Economics Support (X_1), Market Access (X_2), and Government Policy Support (X_3) each have a significant positive influence on Farmer Welfare and Regional Development (Y). Agricultural Economics Support, with a coefficient of 0.321 and Sig. 0.000, demonstrates that strengthened extension services, improved credit access, training, and effective resource allocation substantially enhance welfare and development outcomes. Market Access, reflected by a coefficient of 0.284 and Sig. 0.004, indicates that better transportation, pricing information, and stronger buyer networks meaningfully improve farmers' economic conditions and regional growth. Meanwhile, Government Policy Support, with a coefficient of 0.259 and Sig. 0.010, confirms that subsidies, input assistance, infrastructure development, and protective regulations significantly

contribute to improving both welfare and regional development. Collectively, these findings highlight the crucial role of economic support systems, market structures, and policy interventions in driving positive outcomes in the agricultural sector.

4.5 Discussion

The findings of this study demonstrate that Agricultural Economics Support, Market Access, and Government Policy Support each play significant roles in enhancing farmer welfare and regional development in Indonesia. Regression analysis shows that Agricultural Economics Support (X_1) has the strongest influence, indicating that access to credit schemes, agricultural training, extension services, and technological innovation significantly boosts farmers' productivity and income. These results align with previous research emphasizing the importance of agricultural economics interventions in promoting efficient resource use, encouraging technology adoption, and increasing farm profitability. When farmers consistently receive economic and technical support, they become more resilient in dealing with market fluctuations, climate risks, and rising input costs [18], [24], [25]. Therefore, strengthening agricultural economic institutions—such as cooperatives, extension agencies, and financial service providers—remains critical for long-term welfare improvements and rural development.

Market Access (X_2) also shows a positive and significant effect on farmer welfare and regional development. Improved access to local and regional markets—supported by better transportation, reliable price information, and wider buyer networks—enables farmers to sell their products at competitive prices and reduce post-harvest losses. This finding supports existing literature indicating that limited market access often results in price exploitation by intermediaries and reduces farmers' bargaining power [25], [26]. In contrast, efficient and transparent markets create equal opportunities for both small-scale and commercial farmers. Strengthening logistics systems, enhancing digital marketplace platforms, and empowering farmer cooperatives can therefore enhance competitiveness and increase farmers' share of market value. The significant influence of Government Policy Support (X_3) further underscores the essential role of public interventions, such as input subsidies, infrastructure development, irrigation support, price stabilization, and land protection. Although the coefficient for policy support is slightly lower than those for economic and market factors, the findings suggest that policy effectiveness increases when combined with strong economic support systems and market accessibility.

Overall, the combined influence of the three variables ($R^2 = 0.610$) highlights that agricultural and regional development in Indonesia requires a multidimensional and integrated approach. Agricultural Economics Support empowers farmers with the knowledge, resources, and financial capacity needed for productivity growth; Market Access provides opportunities for equitable and profitable transactions; and Government Policy Support ensures stability, fairness, and long-term sectoral development. Together, these factors contribute significantly to improving rural livelihoods, reducing poverty, and stimulating regional economic growth—supporting Indonesia's national development goals and aligning with key Sustainable Development Goals (SDGs), particularly SDG 1 (No Poverty) and SDG 2 (Zero Hunger).

4.5.1 Implications for Practice and Policy

Based on the findings, several strategic implications can be identified, including the need to enhance agricultural extension programs through continuous training and knowledge transfer to strengthen farmers' technical skills and financial literacy; improve market integration by investing in rural road infrastructure, digital marketplace platforms,

and farmer cooperative development to expand access to profitable markets; refine policy implementation so that government programs are better targeted, transparent, and supported by strong monitoring and evaluation mechanisms to maximize benefits for smallholder farmers; and encourage multi-stakeholder collaboration involving government agencies, the private sector, agricultural institutions, and farmer groups to collectively address the complex challenges faced by the agricultural sector and support sustainable rural development.

5. CONCLUSION

This study concludes that agricultural economics plays a vital role in enhancing farmer welfare and promoting regional development in Indonesia, as evidenced by the significant contributions of Agricultural Economics Support in improving productivity, income stability, and overall livelihood quality; the importance of Market Access in enabling farmers to sell their products at fair prices and increase profitability; and the positive influence of Government Policy Support through subsidies, infrastructure development, and regulatory measures that facilitate agricultural growth. Together, these factors account for 61.0% of the variation in farmer welfare and regional development, underscoring the need for integrated and holistic approaches. Accordingly, policymakers are encouraged to strengthen agricultural support systems, expand market accessibility, and implement effective, well-targeted policies while fostering collaboration among government institutions, private stakeholders, and farmer groups. By prioritizing these areas, Indonesia can improve farmer welfare, reduce rural poverty, and achieve more balanced and sustainable regional development.

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