

Research Article

Determinants of Rural Poverty in Western Indonesia 2019-2023

I Wayan Suparta ^{1,*}, Lola Oktaviani ²¹⁻² Department of Development Economics, Faculty of Economics and Business, Universitas Lampung, Indonesia; e-mail : wayan.suparta@feb.unila.ac.id

* Corresponding Author : I Wayan Suparta

Abstract: This study aims to analyze the effect of Farmer Exchange Rate (NTP), agricultural labor, and education on the rural poverty rate in western Indonesia during the 2019-2023 period. Using panel data from 17 provinces and the Fixed Effect Model (FEM) method, the results show that the three independent variables have a negative and significant effect on rural poverty. These findings identify that improving farmers' welfare, optimizing labor in the agricultural sector, and improving education can be effective strategies in reducing poverty in rural areas.

Keywords: Agricultural labor; Education; Farmer Exchange Rate; Panel Data; Rural poverty.

1. Introduction

Poverty is a global problem that is complex and has many dimensions, and can be an obstacle in the growth and acceleration of development that affects the quality of human life, both from economic, social and cultural aspects. (Todaro & Smith, 2009) , poverty is defined as a condition of absolute inability or almost inability of individuals to meet basic needs such as food, clothing, and shelter (Sudiana & Sudiana, 2015) . Rural poverty is a major challenge in Indonesia's economic development. Although various programs have been launched, the poverty rate in rural areas is still high. The agricultural sector as the backbone of the rural economy has an important role in alleviating poverty.

The characteristics of the rural population, which is dominated by workers in the agricultural sector, can be an alternative way for the government to alleviate poverty in rural areas (Anggreani et al., 2023) . Farmers in Indonesia are synonymous with low levels of income and education, so that improving the welfare of farmers will indirectly have an impact on alleviating rural poverty. On the other hand, most of the provinces in IBB, such as Central Java, East Java, West Java, South Sumatra, Lampung, North Sumatra, Aceh, and Banten, as reported by the Central Bureau of Statistics referring to the Ministry of Agriculture (2022), are areas that have superior potential in agricultural products.

Received: April 29, 2025

Revised: May 11, 2025

Accepted: May 25, 2025

Published: May 27, 2025

Curr. Ver.: May 27, 2025



Copyright: © 2025 by the authors.

Submitted for possible open

access publication under the

terms and conditions of the

Creative Commons Attribution

(CC BY SA) license

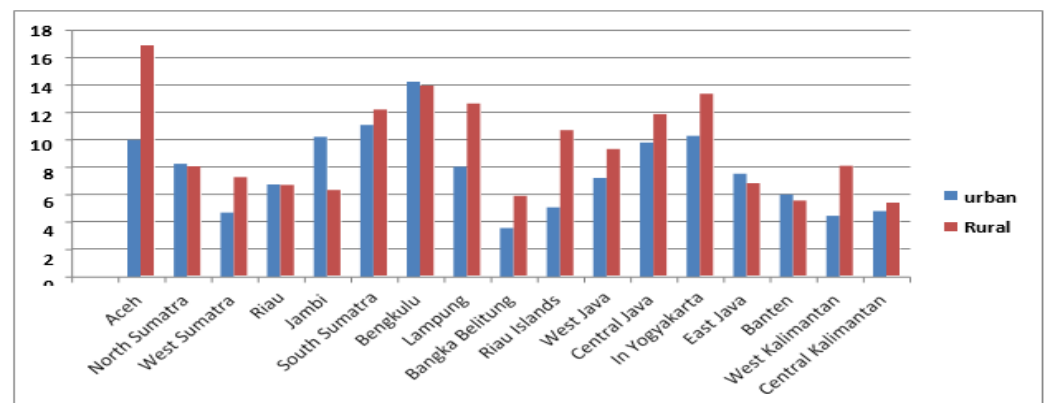
(<https://creativecommons.org/licenses/by-sa/4.0/>)

Figure 1. Areas That Have Superior Potential In Agricultural Products

Source: Central Bureau of Statistics 2023

Rural and urban poverty in Western Indonesia according to data from the Central Bureau of Statistics (BPS) shows that poverty rates in rural areas are higher than those in urban areas, with Aceh, Central Java, and East Java having significant gaps as of March 2023. Some provinces such as Bengkulu and Lampung show relatively balanced poverty rates between urban and rural areas, at around 12%-14%. In conclusion, villages tend to be more affected by poverty than cities in almost all provinces, with the gap varying by region.

Employment in the agricultural sector holds a vital role in driving economic growth and reducing poverty, particularly in rural regions. As the primary sector employing the majority of the workforce, agriculture serves as the main livelihood source for local communities. According to Indra (2023), the number of workers engaged in this sector is a crucial determinant of poverty levels, especially in regions where agriculture is the dominant economic activity.

The relationship between the Farmer Exchange Rate (NTP) and the agricultural sector's contribution to the economy can be observed from various perspectives. Olajide et al. (2010) suggest that a robust agricultural sector should be capable of feeding the population, creating jobs, earning foreign exchange, and supplying raw materials for the industrial sector. This sector is considered to have wide-ranging impacts on both socio-economic and industrial development. However, several challenges hinder its potential, including sluggish structural economic transformation, low educational attainment among farmers, limited access to financial resources, and unfavorable exchange rate fluctuations, as noted by Abubakar et al. (2018).

NTP is the ratio between the price index received by farmers (It) and the price index paid by farmers (Ib) expressed as a percentage Central Bureau of Statistics, (2022) . The link between farmers' welfare and the purchasing power of the poor can be understood through the role of the Farmer Exchange Rate (NTP) as an indicator that reflects the balance of farmers' income and expenditure. According to (Bappenas & JICA; Vibriane et al., 2019) , the higher the NTP, the greater the purchasing power of farmers, indicating a relative improvement in their welfare. NTP is not only important to measure farmers' ability to fulfill their daily needs, but also to support sustainable agricultural activities.

In addition, education has an important role in reducing poverty, both in Indonesia and in other countries, especially in the long run (Ulfatussaniah et al., 2024) . This role can be seen in two ways: indirectly, education helps to increase overall productivity and efficiency, while directly, education provides training to poor people to have skills that can increase their productivity and income Arsyad, (2010) .

Based on this background, this study aims to analyze the effect of NTP, agricultural labor, and average years of schooling on rural poverty in western Indonesia..

2. Method

This study employs a quantitative research approach. The data utilized are secondary data, specifically panel data, which combines cross-sectional data from 17 provinces with time-series data spanning from 2019 to 2023. The data source for this research is publications from the Central Bureau of Statistics.

The regression model used is as follows:

$$KP_{it} = \beta_0 - \beta_1 TKP_{it} - \beta_2 NTP_{it} - \beta_3 RLS_{it} + \epsilon_{it}$$

Description:

KP : Rural Poverty (%)

NTP : Farmer Exchange Rate (%) TKP : Labor in agriculture (%)

RLS : Average Years of Schooling in Rural Areas (Years)

ϵ_{it} : Error term (nuisance variable).

i : Region index (province/district).

t : Time index (year).

3. Results and Discussion

3.1 Analysis Results of Normality Test and Classical Assumptions

Normality and Classical Assumption Testing is carried out in order to obtain data to be studied with unbiased and best results.

Table 1. Normality Test Results

Jarque-Bera	Prob
3.281373	0.193847

According to the results presented in Table 1, the classical assumption tests for the Fixed Effect Model (FEM) indicate that the data follows a normal distribution, as the Jarque-Bera probability value of 0.193847 is greater than the significance level of 0.05.

Table 2. Multicollinearity Test Results

	NTP	TKSP	RLS
NTP	1.000000	-0.486167	0.285339
TKSP	-0.486167	1.000000	-0.122704
RLS	0.285339	-0.122704	1.000000

The value of the correlation matrix between independent variables is smaller than 0.80, so it can be said that there is no multicollinearity in this study.

Table 3. Heteroscedasticity Test Results

R-squared	0.333662	Mean dependent var	0.802212
Adjusted R-squared	0.138886	S.D. dependent var	0.512218
S.E. of regression	0.513017	Sum squared resid	17.10712
F-statistic	1.713055	Durbin-Watson stat	2.895028
Prob(F-statistic)	0.056577		

Based on Table 3. Showing the results of the heteroscedasticity test results in a calculated x^2 value of 8.55356 which is smaller than x table of 9.487729, so it can be concluded that there are no symptoms of heteroscedasticity in the model. Thus, the regression model used has met the classical assumptions and is suitable for use in further analysis.

3.2 Model Selection Test Results

To identify the most suitable model, the researchers performed tests to select the appropriate panel data regression estimation method, specifically using the Chow test and the Hausman test.

Table 4. Chow Test Results

Effects Test	Statistic	d.f.	Prob.
Cross-section F	40.426257	(16,65)	0.0000
Cross-section Chi-square	203.442227	16	0.0000

When viewed from Table 4. shows the Prob value. Cross-section Chi-Square value of $0.0000 < \alpha$ ($\alpha = 0.05$), then reject H_0 which means that the model used is the Fixed Effect Model (FEM).

Table 5. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	13.860631	3	0.0031

Referring to Table 5, the probability value for the Cross-section random effect is 0.0446, which is less than the significance level of 0.05. This indicates that the Fixed Effect Model (FEM) is the appropriate model to use. Therefore, it can be concluded that the panel data

regression estimation method applied in this study is the Fixed Effect Model (FEM), as shown in the table below.

Table 6. FEM Regression Analysis Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	24.71416	2.702069	9.146383	0.0000
NTP	-0.000184	5.34E-05	-3.443113	0.0010
TKSP	-0.000617	0.000260	-2.375960	0.0205
RLS	-0.906564	0.296692	-3.055576	0.0033
R-squared	0.948210		Mean dependent var	10.33929
Adjusted R-squared	0.933457		S.D. dependent var	13.89914
S.E. of regression	0.900986		Sum squared resid	55.78307
F-statistic	436.1017		Durbin-Watson stat	1.466628
Prob(F-statistic)	0.000000			

Based on the results in Table 8. obtained the following regression equation results: $KP = 24.71416 - 0.000184NTP - 0.000617TKSP - 0.906564RLS + \epsilon$

The regression results show that if all independent variables remain unchanged, the percentage of poor people in rural areas is 24.71%. Each increase in the farmer exchange rate reduces rural poverty by 0.00018%, labor in the agricultural sector reduces rural poverty by 0.00061%, and a one-year increase in education reduces rural poverty by 0.906%. All coefficients are negative, which implies an inverse relationship between each variable and the level of rural poverty in Western Indonesia.

The results of the t-test show that the variables of farmer exchange rates, labor in the agricultural sector, and education have a negative and significant effect on the percentage of poor people in rural , with a probability value of each below 0.05. Meanwhile, the F-test statistics show that with an F-table of 2.468 and a probability value of $0.00000 < 0.05$. So this shows that rural poverty in Western Indonesia is simultaneously influenced by the farmer exchange rate, labor in the agricultural sector, and education.

3.3 The Effect of Farmer Exchange Rate on Rural Poverty

The analysis results indicate a negative relationship between the variables, meaning that an increase or decrease in the Farmer Exchange Rate leads to a corresponding decrease or increase in rural poverty in Western Indonesia. This relationship aligns with both theoretical frameworks and several empirical studies. According to Simatupang (1992), as cited in Nirmala et al. (2016), and based on general equilibrium theory, fluctuations in the Farmer Exchange Rate (NTP) reflect changes in the welfare levels of farmers. In addition according to him, the characteristics of NTP have a downward trend due to the inelastic nature of agricultural products

The results of this study are in line with empirical work conducted by (Kharisma, 2020) , (Rahmawati, 2020) that the regression results show a negative effect on poverty. These results prove that the lives of farmers are increasingly prosperous with the higher NTP and have an impact on reducing poverty. Thus, based on the above opinion, it can be concluded that the most important element in measuring the welfare of workers in the agricultural sector in a region by looking at the ratio of the purchasing power value of its output reflected in the Farmer Exchange Rate (NTP). The capability of the output contribution can be obtained from the growth scale of the agricultural sector. With the increase in this sector as a form of effort in contributing to the improvement of the welfare of the farming community and supporting farm business capital so that it ultimately has an impact on alleviating rural poverty in Western Indonesia.

3.4 The Effect of Labor in the Agricultural Sector on Rural Poverty

The analysis results reveal a negative relationship between the variables, indicating that an increase or decrease in Agricultural Sector Labor will lead to a corresponding decrease or increase in rural poverty in Western Indonesia, moving in the opposite direction. The results

of this study are reinforced by the Agricultural Intensification Theory initiated by Ester Boserup, an economist in the 80s, who has a different view from Malthus that population growth will have an impact on the use of a more intensive agricultural system in a rural community. As a result, it will increase output in the agricultural sector and shape the capacity of productive human resources. (Marquette, 1997)

This result is in line with research (Indra, 2023) which shows that the number of workers in the agricultural sector has a significant effect on poverty. This is due to the ability of the agricultural sector to absorb labor that is not absorbed in other sectors. Thus, the agricultural sector acts as a safety valve in overcoming unemployment spikes that have the potential to increase poverty levels.

3.5 The Effect of Education on Rural Poverty

The analysis results indicate that the relationship between the variables is negative. This implies that any rise or fall in the Education variable, as measured by the Average Years of Schooling, will lead to an opposite movement in the level of Rural Poverty in Western Indonesia. This inverse relationship is consistent with existing theories and supported by various empirical studies. According to the core principles of human capital theory, an individual's education and experience play a crucial role in supporting a nation's economic progress. Education enhances knowledge and skills, which not only serves as consumption but also functions as an investment and a productive resource for future development (Todaro, M. P., & Smith, 2011).

Furthermore, these findings are consistent with previous studies such as those by Firdaus et al. (2021), Marinho et al. (2019), and Rahmawati (2020), which also found that the Average Years of Schooling has a negative and significant impact on poverty. This suggests that, over time, education can play a key role in reducing poverty by enhancing the quality of facilities and increasing the productivity of the population. As individuals attain higher levels of education, their knowledge and skills improve, which in turn can directly boost their productivity.

A high-quality education is expected to enable individuals to produce goods and services more efficiently, leading to optimal income generation. This increased income can help meet various needs and desires, ultimately helping individuals escape poverty. Therefore, to drive economic growth, a substantial workforce is needed across different sectors. In this context, the government's role should not be limited to enhancing the education system but should also include support for skill development through pre-employment training programs to ensure a well-prepared labor force.

4. Conclusions and Suggestions

Based on the analysis of the Farmer Exchange Rate, Agricultural Sector Labor, and Education on Rural Poverty in Western Indonesia, the following partial conclusions can be drawn:

(1) The Farmer Exchange Rate has a negative and significant impact on rural poverty in Western Indonesia; (2) Employment in the agricultural sector also shows a negative and significant effect on rural poverty in the region; (3) Education, measured by the Average Years of Schooling, negatively and significantly influences rural poverty in Western Indonesia.

Moreover, when considered collectively, the Farmer Exchange Rate, Agricultural Sector Labor, and Education all have a jointly significant effect on rural poverty in the region.

Policies aimed at reducing poverty should take into account the unique characteristics and conditions of poverty in each specific region. Particularly in the Indonesian region, where the problem of poverty boils down to the agricultural sector, building the potential for sustainable development of the agricultural sector as an economic barn will also reduce other socio-economic problems such as unemployment. Some important things that must be taken are the need for the government's role in increasing the role of the agricultural sector in a localized manner, optimizing employment as well as income distribution, and paying attention to sectors that can directly affect the poor. In addition, providing stability and facilities for the production factors needed by farmers such as the allocation of fertilizer and seed subsidies on target, the assistance of agricultural machinery and tools in reducing the capital spent, as well as the revitalization of agriculture, fisheries, and forestry and community development so as to make this sector a leading sector because its blessings are able to have a positive effect on the economy.

References

- [1] A.-M. J. Abubakar, S. S. Abubakar, M. S. Ibrahim, and A. Kolo, "Agriculture and Poverty Reduction in Nigeria; A Review," *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, vol. 23, no. 2, pp. 61–68, 2018, doi: 10.9790/0837-2302046168.
- [2] M. Anggreani, A. Ratih, M. Husaini, Z. Emalia, M. Usman, N. Aida, and U. Ciptawaty, "Analysis of the Effect of the Agricultural Sector on the GRDP of the Agricultural Sector in Indonesia in 2015–2021," *Journal on Education*, vol. 6, no. 1, pp. 6490–6507, 2023, doi: 10.31004/joe.v6i1.3871.
- [3] L. Arsyad, *Microeconomics*, Yogyakarta: BPFE Gajah Mada University, 2010.
- [4] Bappenas & JICA; Vibriane et al., "Journal 4 Farmer-Exchange-Value-Analysis-NTP," 2019.
- [5] Central Bureau of Statistics, *Farmer Exchange Rate Statistics*, Central Bureau of Statistics, 376, 2022.
- [6] A. Firdaus, T. C. Dawood, and M. Abrar, "Determinants of Poverty in Indonesia: An Empirical Evidence Using Panel Data Regression," *International Journal of Global Operations Research*, vol. 2, no. 4, pp. 124–132, 2021, doi: 10.47194/ijgor.v2i4.90.
- [7] I. Indra, "The Effect of Agricultural Sector Labor and Agricultural Sector GDP on Economic Growth and Poverty in Indonesia," *Journal of Integra Economics*, vol. 13, no. 1, pp. 1–16, 2023, doi: 10.51195/iga.v13i1.258.
- [8] B. Kharisma, "Agricultural Government Expenditure, Production and Rural Poverty in Indonesia," *Journal of Applied Quantitative Economics*, Sep. 2020, pp. 211, doi: 10.24843/jekt.2020.v13.i02.p01.
- [9] E. Marinho, G. Campelo, J. França, and J. Araujo, "Impact of Infrastructure Expenses in Strategic Sectors for Brazilian Poverty," *EconomiA*, vol. 18, no. 2, pp. 244–259, 2019, doi: 10.1016/j.econ.2017.01.002.
- [10] C. Marquette, "The Environment Relationships," unpublished, Jan. 1997.
- [11] A. Nirmala, N. Hanani, and A. Muhaimin, "Analysis of Factors Affecting the Exchange Rate of Food Crop Farmers in Jombang Regency," *Habitat*, vol. 27, no. 2, pp. 66–71, 2016, doi: 10.21776/ub.habitat.2016.027.2.8.
- [12] O. T. Olajide, B. H. Akinlabi, and A. A. Tijani, "Agriculture Resource and Economic Growth in Nigeria," *European Scientific Journal*, vol. 8, no. 22, pp. 103–115, 2010.
- [13] N. Rahmawati, "The Effect of Farmer Welfare on Poverty in Rural Areas," *Journal of Economics and Development*, vol. 20, no. 1, pp. 38–44, 2020. [Online]. Available: <https://jurnal.uns.ac.id/jiep/article/view/35518/26925>
- [14] I. W. Sudiana and I. K. Sudiana, "The Effect of GRDP, Education, and Labor Structure on Poverty in Bali Province," *Journal of Development Economics*, vol. 4, no. 6, pp. 608–620, 2015.
- [15] M. P. Todaro and S. C. Smith, *Economic Development*, 11th ed., Erlangga, 2011.
- [16] A. Ulfatussaniah, A. Murwiati, and H. Wahyudi, "The Effect of Government Spending on Health, Education, Infrastructure and Poverty Levels on the Human Development Index in Districts/Municipalities in the Three Poorest Provinces on the Island of Sumatra," *Journal on Education*, vol. 6, no. 3, pp. 16720–16729, 2024. [Online]. Available: <https://jonedu.org/index.php/joe/article/view/5550>