The Correlation Between Government Expenditure and Agricultural Contribution to Rural Poverty in Indonesia

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Abstract

Poverty rates in rural areas of Aceh, Bengkulu, Lampung, West Nusa Tenggara, East Nusa Tenggara, North Sulawesi, Southeast Sulawesi, and Gorontalo exceed the national average, despite the agricultural sector's significant contribution. This study seeks to assess the impact of government spending and agricultural sector contributions on rural poverty in these provinces. This study uses panel data regression for the 2015-2019 period, with secondary data from the Central Bureau of Statistics and the Ministry of Finance, and the analysis covers eight provinces. The results show that the farmer exchange rate, agricultural production value, and rural income inequality significantly affect rural poverty. However, government spending on agriculture, the agriculture sector contribution, and agricultural labor did not show a significant impact. It can be concluded that higher farmer exchange rates and agricultural production reduce poverty, while rising income inequality worsens it. It is recommended that the government continue its efforts to enhance farmer exchange rates and agricultural production while also addressing income inequality. Future research should focus on collecting more detailed regional government expenditure data, separating expenditure allocations and analyzing specific agricultural sectors over extended periods.

Keywords*: agricultural government expenditure, agricultural sector contribution, farmer exchange rate, rural poverty*
JEL*: H59, O13, I32*

A. INTRODUCTION

Poverty is a condition in which an individual or a group of people face significant challenges in accessing essential economic resources, such as income, employment opportunities, healthcare, education, food security, and adequate housing. It represents not just a lack of financial means but also a deprivation of basic human needs that are considered necessary for a decent standard of living. People are classified as poor if their income levels or living conditions fall far below what is regarded as acceptable or sufficient within a particular society. This means that poverty is often relative, varying according to the socio-economic context of the community or country.

Todaro and Smith (2011) provide a more specific definition of poverty, describing it as a person's inability to secure the necessary means to satisfy basic needs, such as income, food, clothing, healthcare, shelter, and other essential services. Their definition emphasises the multidimensional nature of poverty, highlighting that it is not merely a financial issue but one that encompasses a broader range of deprivations, including access to essential services and opportunities. Poverty, therefore, reflects a person's inability to participate fully in society due to systemic barriers that limit their access to resources. The characteristics of poor populations, according to Todaro, are that they live in rural areas and work in the agricultural sector.

The Sustainable Development Goals (SDGs) prioritise the eradication of poverty as their first objective. Since the commitment to ending poverty became a central focus of the SDGs, Indonesia has seen a downward trend in both the number and percentage of its population living in poverty. In March 2015, 11.22 per cent of Indonesia's population was categorised as poor.

Source: Central Bureau of Statistics (2019)

Figure 1. Percentage of Population Aged 15 and Over Who Worked in the Past Week by Main Occupation, February 2019

By March 2019, this percentage had decreased to 9.22 per cent, reflecting a 1.81 per cent reduction in the poverty rate over the five years (Central Bureau of Statistics, 2019a).

Although poverty rates have decreased, the distribution of the poor remains highly uneven. In Indonesia, there is a higher concentration of poor people living in rural areas compared to urban areas. As of March 2019, there were 25.14 million people, or about 9.41 per cent of the population, classified as poor. Of this number, 15.15 million, or approximately 12.85 per cent of the poor population, lived in rural areas. In contrast, the remaining 9.99 million, or about 6.69 per cent, lived in urban areas (Central Bureau of Statistics, 2019c). This means that more than half of the total poor population lives in rural areas.

The International Fund for Agricultural Development highlights that a substantial majority of the Indonesian population resides in rural areas, with approximately three out of five individuals living outside urban centres. Within these rural areas, the predominant occupation for many is farming. This indicates that a large proportion of the rural poor are engaged in agricultural work. Agriculture, in fact, is the largest employer in Indonesia. As of February 2019, this sector absorbed 29.46 per cent of the total workers, or approximately 38.11 million individuals employed in the agriculture sector (Central Bureau of Statistics, 2019b).

Although the agricultural sector employs a significant portion of the workers, its overall contribution to Indonesia's economy has been declining and is no longer dominant. Between 2015 and 2019, the agricultural sector's share of the national GDP fell by 0.78%, decreasing from 13.49% to 12.71%. Research by Hardianty et al. (2023) indicates that the contribution of the primary sector, including agriculture, negatively impacts poverty levels in Indonesia. It means that a higher contribution from the agricultural sector is associated with poverty reduction. Ideally, provinces with a significant contribution of agriculture to their Gross Regional Domestic Product (GRDP) should experience lower poverty rates. However, in Indonesia, many provinces still exhibit high levels of both agricultural contribution to GRDP and poverty.

In Indonesia, there are eight provinces where the agricultural sector's contribution to Gross Regional Domestic Product (GRDP) surpasses both the agricultural sector's contribution to Gross Domestic Product (GDP) and the

percentage of the rural population living in poverty. These provinces are Aceh, Bengkulu, Lampung, West Nusa Tenggara, East Nusa Tenggara, Central Sulawesi, Southeast Sulawesi, and Gorontalo. Data shows an upward trend in agricultural GRDP across these selected provinces. Research by Arham (2020) indicates that significant growth in agricultural production value plays a critical role in reducing rural poverty in Indonesia. This is due to the agricultural sector's substantial impact on rural economies. Consequently, an increase in agricultural production value can effectively contribute to lowering poverty levels in rural areas.

To support economic development, the government implements various efforts to encourage growth, one of which is through fiscal policies, particularly government spending in the agricultural sector. From 2015 to 2019, government expenditure on agriculture in the selected provinces generally increased. According to Keynesian theory, increased government spending can reduce poverty through the multiplier effect (Alamanda, 2020). Government spending can enhance infrastructure, especially agricultural infrastructure in rural areas, which will boost farmers' productivity and facilitate their access to markets for selling agricultural products, thereby boosting farmer incomes (Etuk & Ayuk, 2021). The rise in farmer income can ultimately help lift them out of poverty (Nanhthavong et al., 2020).

The farmer's exchange rate (NTP) has an inverse relationship with rural poverty, suggesting that as the NTP rises, rural poverty tends to decrease (Kharisma et al., 2020). The NTP measures the ratio between the prices farmers receive and the prices they pay. In the provinces of Lampung, West Nusa Tenggara, East Nusa Tenggara, and Gorontalo, the NTP is above 100, meaning that farmers in these areas are earning more relative to their costs. On the other hand, in the provinces of Aceh, Bengkulu, Central Sulawesi, and Southeast Sulawesi, the NTP is below 100, indicating that farmers in these regions are earning less than their expenses.

According to data from the Central Bureau of Statistics (BPS), income inequality among the rural populations in eight selected provinces from 2015 to 2019 was relatively low. The Gini Ratio for these provinces ranged between 0.28 and 0.38, which are indicative of a relatively low level of inequality. The Gini Ratio is a measure of income distribution where a value closer to 0 represents a more equitable income distribution and a value closer to 1 signifies higher inequality. Despite the low levels of inequality observed, it is important to note that even modest levels of income disparity can still pose challenges. Research conducted by Arham (2020) highlights that income inequality in rural areas can complicate efforts to reduce poverty. This is because income inequality can exacerbate poverty by limiting access to resources and opportunities for the lower-income segments of the population.

Economic development in the eight provinces of Aceh, Bengkulu, Lampung, West Nusa Tenggara, East Nusa Tenggara, Central Sulawesi, Southeast Sulawesi, and Gorontalo faces a range of complex issues. One notable challenge is that rural poverty rates in these provinces are higher than the national average, even though the contribution of the agricultural sector in these areas is greater than in other regions. This discrepancy highlights the paradox where, even though these provinces have a significant agricultural output, it has not translated into a proportional reduction in rural poverty.

Furthermore, a significant portion of the rural population in these provinces is employed in agriculture, underscoring the sector's essential role in the rural economy. This dependency on agriculture suggests that improvements in the agricultural sector could potentially have a substantial impact on rural livelihoods. However, despite its importance, the farmer's exchange rate—a measure of the relative prices farmers received compared to what they pay—remains

low in some provinces. This indicates that farmers are not benefiting adequately from their agricultural activities, which can hinder poverty reduction efforts.

Previous studies have produced varied findings regarding the issue. For instance, Arham (2020) found that agricultural financing and the farmer's exchange rate have not significantly contributed to lowering poverty levels. This suggests that merely providing financial support or improving exchange rates may not be sufficient on their own. In contrast, research by Purmini and Rambe (2021) indicates that government spending has a significant negative impact on rural poverty, suggesting that strategic government expenditure can be effective in reducing poverty. On the other hand, Kharisma et al. (2020) found that improvements in the farmer's exchange rate do positively influence poverty reduction, emphasising the potential benefits of enhancing the economic conditions of farmers.

Although the relationship between government expenditure and rural poverty has been widely studied, the specific relationship between agricultural government expenditure and rural poverty in Aceh, Bengkulu, Lampung, West Nusa Tenggara, East Nusa Tenggara, North Sulawesi, Southeast Sulawesi, and Gorontalo, which are provinces with significant agricultural sector output contribution and high rural poverty, has yet to be thoroughly examined. Given the growing importance of poverty reduction and the potential influence of agricultural sector development, especially in rural areas, it is essential to investigate this relationship more comprehensively.

Therefore, this study seeks to answer the following research question: How does government expenditure in the agricultural sector, farmer exchange rates, agricultural production value, the contribution of the agricultural sector, and agricultural labor contribution affect rural poverty in Aceh, Bengkulu, Lampung, West Nusa Tenggara, East Nusa Tenggara, North Sulawesi, Southeast Sulawesi, and Gorontalo during 2015-2019?

This study aims to assess the impact of government expenditure and the contribution of agricultural sector on rural poverty in these eight provinces from 2015 to 2019. It is also analyze the role of key factors such as farmer exchange rates, agricultural production, agricultural labor, and income inequality.

B. LITERATURE REVIEW

According to Undang-Undang No. 24 of 2004, poverty is a social situation in which a person or a group of people are unable to meet the most basic needs necessary to maintain and develop a decent and dignified life. The law affirms the state's obligation to protect its citizens from poverty and improve their quality of life through social, economic, and cultural policies that support poverty alleviation. It also includes the fulfillment of the right to live without discrimination, access to equal opportunities, and full participation in community life.

World Bank (2022) defines poverty using a minimum threshold measure. A person is said to be poor when their income or consumption is not enough to put them above the set minimum standard, i.e. income is less than $2.15 per day. This means that someone who has an income below $2.15 per day is classified as a poor group. This income is considered insufficient to access the necessities of life, such as the need to eat, shelter, dress, get an education, and health care.

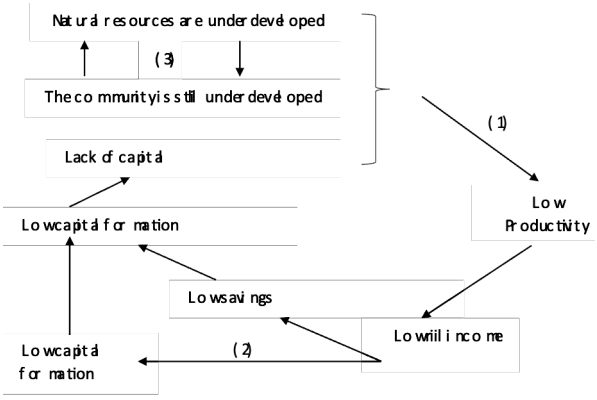
The problem of poverty is often associated with the vicious circle of poverty, as Ragnar Nurkse explained that poverty is not only caused by the absence of development that has been carried out, but also poses obstacles in the development process in the future. The vicious circle of poverty, or what is often also called the poverty trap, is a series of forces that influence each other in such a way that they create a situation where a country will remain poor and have difficulty achieving a higher level of development (Sukirno, 2006).

Nurkes explained that the poverty trap circle was formed because of the obstacles to the creation of a high level of capital formation and could be described from two sides, namely the capital supply side and the capital demand side. In terms of capital supply, poverty can be seen from the low real income of the community due to low productivity. Due to the lack of income, the amount of savings remains low. The low income and savings of the community subsequently cause low new capital formation. Therefore, supply becomes low as the economy fails to increase productivity in all sectors. The vicious cycle will continue to repeat because low productivity subsequently causes a decline in people's income levels.

From the side of capital demand, a vicious cycle of poverty is formed because low-income people mean that the purchasing power of these people is limited. As a result, their demand for commodities or services remains low; thus, market growth becomes limited. The market is limited, and low demand leads to a low formation rate because people's desire to invest drops, as the opportunity to make a profit is minimal in a small market. Therefore, productivity decreases, and the vicious cycle repeats itself.

In addition to the two sides expressed by Nurkes, Meier and Baldwin also expressed their views on the cycle of poverty traps. Meier and Baldwin stated that the cycle of poverty occurs because of the link between underdeveloped communities and undeveloped natural resources. To make optimal use of natural resources, skilled labour is needed, but in developing countries, low levels of education limit the availability of experts. As a result, the mobility of resources is limited, natural resources are not fully utilized, incomes are low, and it is difficult for people to improve their knowledge and expertise.

The three circles of poverty that have been described earlier are described as follows:



Source: Sukirno (2006)

Figure 2. Poverty Trap

Keynesian economists emphasised the importance of the role of governments, such as fiscal and monetary policy, to reduce income inequality and address poverty. Based on the Keynesian view, government intervention in the economy can reduce income inequality and poverty through three paths (Alamanda, 2020). The first path, namely, government spending directed at specific sectors, has significant potential to alleviate economic constraints and improve the living standards of low-income residents.

Second, job creation in specific sectors increases, the less unemployment will occur, and this contributes to a decrease in inequality and poverty levels. Projects such as infrastructure development can absorb local labour, especially from low-income groups who often do not have access to formal work. By getting a stable job, people can increase their income. As a result, people have more money to meet basic needs and poverty is reduced.

Third, the multiplier effect of job creation programs can lead to a significant increase in economic activity and encourage various reinvestments. When the government launches programs that create new jobs, the additional income received by workers will increase their purchasing power. An increase in purchasing power will increase the demand for goods and services, which in turn stimulates production in various sectors of the economy.

The government plays an important role in the economy, including formulating policies. The role of the government in regulating the economy can be in the form of fiscal policy. This policy is used to maintain economic stability and achieve sustainable economic growth and reduce poverty. Historically, fiscal policy as a policy instrument has undergone systematic development. Prior to 1930, the government had a limited role, or a *hands-off* approach. As a result of the stock market crash and the *Great Depression*, policymakers are encouraging the government to play a more active role in the economy. Until now, many countries have been actively implementing fiscal policies, especially when the world economy is facing the threat of recession (Horton, 2024).

Government spending is one of the fiscal policy instruments. According to Mangkoessoebroto (2002), government expenditure is a reflection of the expenditure that the government must spend for the implementation of policies in terms of purchasing public goods and services and social protection for the community. In the short term, government spending is a policy tool used to stabilize the macroeconomy. For example, by increasing government spending to stimulate a sluggish economy, or cutting spending to prevent inflation or to help reduce external vulnerabilities. In the long term, the goal is to encourage growth and reduce poverty.

Government expenditure can be allocated for the development of potential sectors. With the correct targets, increasing government spending can have a positive correlation in the economy, namely, increasing economic growth. Furthermore, increasing economic growth can have an impact on economic and social conditions in Indonesia. We believe that increasing GDP can lead to solving social problems such as poverty. This statement is in line with Keynes's theory, where increasing economic growth requires effective government spending (Prasetyo & Cahyani, 2022). Thus, government spending is an important instrument in fiscal policy used to achieve various development goals, including poverty alleviation.

The Keynesian theory by John Maynard Keynes explains the theoretical basis of government policies to achieve full employment conditions or full employment opportunities, which generally indicate optimal economic performance. The balance of full employment characterized very low unemployment rate because resources have been used optimally, so that maximum *output* and price stability are achieved. According to Keynesian economists, government economic intervention can be carried out to adjust aggregate demand so that full employment conditions can be achieved.

The Keynesian argument for the importance of government intervention assumes that markets are not always as clear as the Classical economic hypothesis predicted because short-term wages and prices are rigid. Rigid prices and wages will make companies fail to sell all the inventory of goods they have produced, leading to the accumulation of unsold inventory (Chipaumire et al., 2014). Price rigidity is a state in which the price of goods and services is not easily adjusted to changes in demand and supply. This could be due to long-term contracts, price adjustment costs, regulation, or market imperfections. Because prices do not adjust quickly, changes in expenditure components such as consumption, investment, or government spending can directly affect the amount of production and sales of goods and services, rather than just affecting prices. These conditions make it difficult for the market to be in balance, and without government intervention, it is challenging to achieve full employment.

One form of government intervention mentioned by Keynes that can directly influence output and aggregate demand is fiscal policy in the form of tax adjustments and government spending (Augustyn, 2021). Government spending as an exogenous policy tool has been proven to be used to influence economic activities

(Selvanathan et al., 2021). Through the mechanism of the *multiplier effect*, Keynesian economists explain that increasing government spending at a time of low demand can stimulate aggregate demand and *Output.* The multiplier effect referred here is that a change in the aggregate expenditure component (investment, consumption, or government spending) results in a larger change in aggregate demand and *Output*. There is a greater chance in aggregate demand and *Output*. This causes a greater impact on the overall economy.

The rural poor are primarily dependent on agriculture, fisheries, forestry, and small-scale industrial sectors. They are not homogeneous groups but can be categorised mainly based on access to agricultural land. First, there are cultivator farmers (small landowners and tenants) and non-cultivator farmers (workers). Cultivator farmers are part of the poor population in the countryside who are directly involved in the agricultural production process. In many countries, these groups often face pressure to leave agriculture due to market forces and policies that are less favourable to them.

Meanwhile, the group of non-cultivator farmers was among the poorest groups in the countryside. This group relies on seasonal demand for labour in agriculture and in rural small-scale informal industries and services. This makes them more vulnerable to fluctuations in labour demand, wage levels, and food prices. In fact, their access to infrastructure, public services and public sector security networks is limited. Poverty and low social status in most of these communities are the leading causes of chronic poverty.

All groups of the rural poor face significant risks due to changes in weather, health, markets, investment, and public policy. These fluctuations can affect the price and quantity of their assets and production, potentially exacerbating their poverty or offering opportunities to overcome it. The main problem is that the rural poor are less likely to be prepared to deal with such shocks effectively. In addition, economic crises and natural disasters can sharply increase poverty levels.

The diversity of economic and societal characteristics in a country, as well as some external influences, creates and perpetuates rural poverty. According to Khan (2001), there are several causes of rural poverty, including the following:

1. The existence of political instability and civil strife.
2. There is systemic discrimination based on sex, race, ethnicity, religion, or caste.
3. The existence of unclear property rights or unfair enforcement of rights to agricultural land and other natural resources.
4. There is a high concentration of land ownership and asymmetrical rental arrangements, which creates an imbalance of power in the rural economy.
5. The existence of corruption and groups that use power for personal gain.
6. The existence of economic policies that discriminate against or exclude the rural poor from the development process can exacerbate poverty.
7. Families with a high dependency ratio tend to grow rapidly, which means that the dependents of the productive population are becoming larger.
8. There are market imperfections due to high concentrations of land and other assets and distorted public policies; and
9. There are external shocks due to changes in natural conditions (e.g., climate change) and international economic conditions.

Several previous studies have shown mixed results. Various things cause differences in research results. First, the results of the study depend on a sample of research data. A study using cross-country panel data can have different results from a study using national data. Similarly, studies that use data from developed and developing countries can have different results as well. In addition, differences in research methods

can also affect the results of the research. Research conducted by Purmini & Rambe (2021) found that agricultural sector workers had a significant and positive correlation with poverty rates in Sumatra Province, while education levels and government spending had a negative and significant correlation with poverty rates.

Furthermore, research by Susilastuti (2018) found that the productivity of farmland and wetland areas has a firm relationship with agricultural production. Agricultural land productivity has a significant influence on agricultural production. Agricultural production has no significant influence on the growth rate of GRP. Agricultural production has not been able to reduce poverty. The growth rate of GRP has a significant correlation and is the dominant factor for poverty reduction.

Tedesco et al. (2015) found statistically significant evidence that OECD agricultural policies exacerbated poverty rates in some developing countries. Most major food exporters appear to be negatively impacted by the OECD's support for agriculture.

Suwardi (2011). in his research, he found that local governments for infrastructure and education significantly affect agricultural productivity and poverty. The study also found that the value of the multiplier effect of local government spending on poverty, roads was the largest, followed by education (literacy rate) and irrigation.

Christiaensen et al. (2010) found that agriculture is far more effective than non-agricultural sectors in alleviating poverty, particularly for the most impoverished individuals. Although overall economic growth is a key contributor to poverty reduction, the growth in agricultural incomes serves as a particularly significant factor in alleviating poverty (Cervantes-Godoy & Dewbre, 2010)

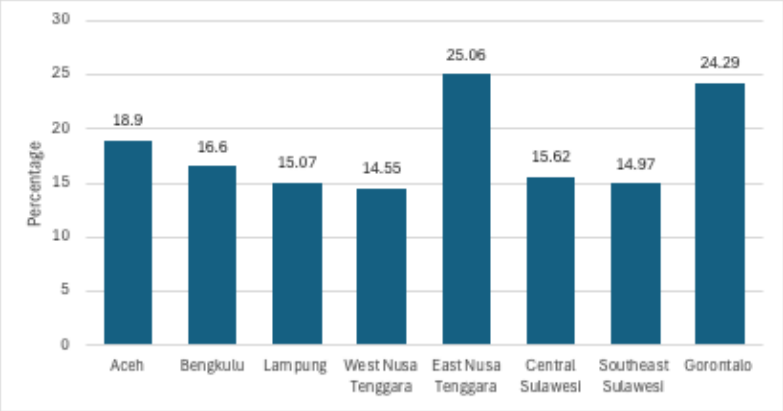
Fan et al. (2008) found that credit subsidies, fertilisers, and irrigation were essential for smallholders to adopt new technologies, especially during the early stages of the green revolution in the late 1960s and 1970s. However, now investment in agricultural research, education, and rural roads is the three most effective public spending items in promoting agricultural growth and reducing poverty.

C. RESEARCH METHODS

This study uses secondary data sourced from the official website of the Central Bureau of Statistics (BPS), the Ministry of Finance and the Ministry of Agriculture. The data for this study were collected through the literature review method. The data is presented in the form of panel data, which is data containing a collection of time series observations in various cross-sectional units such as countries, states, regions, companies, or individuals or households whose samples are randomly taken (Baltagi, 2005). The panel data structure in this study includes data from 8 provinces and 5-year time-series data (2015-2019).

The analysis method used in this study is panel data regression analysis. This approach was used to assess the impact of several independent variables—such as agricultural government expenditure, the farmer's exchange rate (NTP), the value of agricultural production, the contribution of the agricultural sector, the contribution of agricultural labour, and rural income inequality—on the dependent variable, which is rural poverty. Before the analysis process, the selection of a regression model for panel data estimation is carried out. This test aims to find out the most suitable model to use, which could be the standard effect model, fixed effect model, or random effect model.

Furthermore, a classical assumption test consisting of a normality test, a multicollinearity test, and a heteroscedasticity test was carried out. One of the advantages of using panel data is that autocorrelation tests are not necessary in panel data analysis, as this test is only required for time series data (Basuki, 2015). To help the conclusion process, a regression coefficient test



Source: Central Bureau of Statistics (2019a)

Figure 3. Average Rural Poverty Rate from 2015 to 2019

was also conducted, consisting of a simultaneous regression coefficient test (Test-F), a partial regression coefficient test (t-test) and a determination coefficient test (R2).

The regression estimation model of this research panel data is as follows:

$$\text{ruralpov}_{it} = \beta_0 + \beta_1 \log(agrexp)_{it} + \beta_2 NTP_{it} + \beta_3 log(prodagr)_{it} + \beta_4 shareagr_{it} + \beta_5 sharelabor_{it} + \beta_6 ruralineq_{it} + \text{uit} \quad \text{.....(1)}$$

where ruralpov is the level of rural poverty; agrexp is government expenditure in the agricultural sector represents the realization of the Anggaran Pendapatan dan Belanja Daerah (APBD) for agricultural sector; NTP stands for the farmer exchange rate; prodagr, the value of agricultural sector production as represents the value of the agricultural sector's GDRP; shareagr is the contribution of the agricultural sector's GDRP to national GDP; sharelabor, refers to the contribution of the agricultural sector workforce to the total workforce; And the last ruralineq is the income inequality of the rural population as seen from the Gini ratio.

D. RESULTS AND DISCUSSION

This section contains a discussion of the results of the studies that have been done. The works and discussions are written systematically and critically, following good English.

During the 2015-2019 period, the rural poverty rate in Indonesia reached its peak at 14.21%. This reflects significant challenges in overcoming poverty in rural areas. Several provinces, such as Aceh, Bengkulu, Lampung, West Nusa Tenggara, East Nusa Tenggara, Central Sulawesi, Southeast Sulawesi, and Gorontalo, recorded higher rural poverty rates than the national average.

Provinces such as Aceh, Bengkulu, Lampung, West Nusa Tenggara, East Nusa Tenggara, Central Sulawesi, Southeast Sulawesi, and Gorontalo recorded notably higher poverty rates. Among these, East Nusa Tenggara reported the highest average percentage of poor population over the five years, with an alarming average of 25.06%. This indicates a severe level of poverty that is markedly above the national average, highlighting the urgent need for poverty alleviation measures in this province.

Following East Nusa Tenggara, Gorontalo had the second-highest average rural poverty rate, averaging 24.28% over the same period. This also indicates a high level of poverty, suggesting that similar focused efforts are needed to address the economic challenges faced by the population in Gorontalo. In addition, the provinces of Aceh, Bengkulu, Central Sulawesi, and Lampung reported average rural poverty rates ranging between 15% and 18%. These rates, while lower than those of East Nusa Tenggara and Gorontalo,

still reflect significant poverty levels that warrant ongoing attention and support.

On the lower end of the spectrum, Southeast Sulawesi and West Nusa Tenggara (NTB) recorded average rural poverty rates of 14.96% and 14.55%, respectively. Although these rates are closer to the national average, they still indicate that rural poverty remains a pressing issue that requires continued efforts to ensure sustainable economic development and improved living conditions in these provinces.

This study analyses how various factors related to the agricultural sector (government expenditure in the agricultural sector, farmer exchange rates, agricultural production value, the contribution of the agricultural sector, and agricultural labour contribution) and income inequality in rural areas affect the level of poverty in rural regions. The study uses data from eight provinces in Indonesia: Aceh, Bengkulu, Lampung, West Nusa Tenggara, East Nusa Tenggara, Central Sulawesi, Southeast Sulawesi, and Gorontalo. The observation period spans 5 years (2015-2019), resulting in a total of 40 observations. To obtain the best research results, several processes and stages of analysis are required.

First, a regression model selection test was conducted using the Chow test and the Hausman test. From the model selection process, it was determined that the Fixed Effect Model was chosen. Next, tests were carried out to ensure that the estimates were BLUE (Best Linear Unbiased Estimators). This involved performing classical assumption tests, including the normality test, multicollinearity test, and heteroscedasticity test. The autocorrelation test was not performed as it is only relevant for time series data.

The results of the normality test concluded that the data were normally distributed. In the multicollinearity test, using Pearson correlation, it was found that the correlation values between independent variables were all less than 0.8, indicating that the model is free from multicollinearity issues. Finally, the heteroscedasticity test, using the Glesjer test, showed that the model is free from heteroscedasticity problems.

Next, a panel data regression estimation test was conducted using EViews 10 software. The results of the estimation were examined through a simultaneous regression test, which showed that the independent variables collectively have a significant impact on the dependent variable. A coefficient of determination test was also conducted, which found that the dependent variable, rural poverty (ruralpov), can be explained by 98.69% through the independent variables in the study.

Table 1 Panel Data Regression Estimation Results with Fixed Effect Model

Independent Variables	Coefficient	t-Statistics	Prob.
C	148.9408	6.287.372	0.0000
LOG(AGREXP)	-0.116536	-0.362821	0.7197
NTP	-0.096877	-2.089.821	0.0466 **)
LOG(PRODAGR)	-7.093.694	-4.964.704	0.0000***)
SHAREAGR	-0.031482	-0.573892	0.5710
SHARELABOR	-0.037235	-1.557.713	0.1314
RURALINEQ	9.857.261	1.858.348	0.0745 *)
Prob(F-statistic)		0.000000	
Adjusted R-squared		0.986866	

Source: Estimation Results Using eviews10
Description: Significance *) 10 %, **) 5 % and ***) 1 %

The partial coefficient test results indicated that the farmer exchange rate has a negative and significant correlation with rural poverty at the 5% significance level. Additionally, the value of agricultural production also has a negative and significant correlation with rural poverty at the 1% significance level. Furthermore, the income inequality among rural populations significantly affects rural poverty in a positive direction at the 10% significance level. Meanwhile, the variables for government expenditure in the agricultural sector, the contribution of the agricultural sector, and agricultural labour do not have a significant impact on rural poverty.

The study finds that the agricultural government expenditure did not correlate with

poverty reduction, in contrast to the finding by Fan et al. (2008), which states that spending in the agricultural sector can reduce poverty. Several factors cause differences in the results of the analysis. Firstly, government expenditure allocations for agricultural aid or subsidies are often misdirected (Arham, 2020). Government subsidy programs for the agricultural sector tend to benefit landowners more than agricultural labourers, who, in essence, gain less from such assistance. Most farmers in Indonesia are labourers rather than landowners. This results in the aid being ineffective in improving the welfare of the farmers who need it the most. As a result, the assistance has become less effective as a tool to reduce poverty rates.

In addition, the productivity of the agricultural sector also plays an important role in poverty alleviation. According to Mogues (2011), a weak relationship between government expenditure in the agricultural sector and sector productivity can be a reason for its limited impact on poverty reduction. This means that even though there is an allocated budget, if an increase does not follow it in labour productivity, the impact on poverty reduction will remain minimal. Therefore, to increase the effectiveness of government spending in the agricultural sector in reducing poverty, there needs to be improvements in aid distribution and increased investment to support the productivity of the agricultural sector.

The farmer exchange rate has a significant impact on rural poverty, meaning that the increase in the farmer exchange rate tends to be followed by a decrease in rural poverty. Because this influence is statistically significant, changes in the farmer exchange rate have been shown to correlate with rural poverty levels. The results of these findings are consistent with the findings of Kharisma et al., (2020), which show that the farmer exchange rate (NTP) has a significant correlation with reducing rural poverty. This is because NTP is an indicator of farmers' welfare, measuring their ability to exchange the agricultural output they produce for the inputs they need. The more prosperous the farmers' living standards are, caused by the higher NTP (Nirmala et al., 2016).

There is firm evidence that the value of agricultural production has a significant influence on rural poverty. This means that an increase in the value of agricultural production tends to be followed by a decrease in rural poverty. Since this correlation is highly statistically significant, it can be concluded that changes in the value of agricultural production influence the level of rural poverty. The agricultural sector remains a driving force for economic growth and is crucial for the success of poverty alleviation in rural areas (Kadir & Amalia, 2016). An increase in agricultural production can boost the overall growth of the agricultural sector. The growth of this sector, in turn, has great potential to reduce poverty rates in rural areas.

The relationship between the agricultural sector's contribution to rural poverty is not statistically significant, making it difficult to conclude that the sector's contribution has any correlation to rural poverty. These findings is different from the results of research by Arham (2020). This condition arises because compared to the non-agricultural sector, the agricultural sector in general is less effective in addressing poverty issues (Cuong, 2011). In rural areas, the workforce is dominated by agricultural sector workers who often have low productivity and unstable incomes. Although the agricultural sector can provide jobs for many people, it is often not enough to alleviate poverty due to low wages and productivity.

In contrast, non-agricultural sectors, such as industry and services, tend to offer better opportunities for increased incomes and reduced inequality. Therefore, although agriculture is still a support for the rural economy, its role in reducing poverty is still limited when compared to other sectors that are more dynamic and productive. The contribution of agricultural labour does not affect poverty because many

workers in the agricultural sector have low productivity and income, and therefore cannot significantly reduce poverty.

The contribution of agricultural labour has no impact on rural poverty. Suwardi (2011) and Kharisma et al., (2020), found something similar in their study, that the large number of people working as farmers did not significantly affect agricultural production and poverty. This is because having a job cannot solely free a person from poverty. Many people work but earn small wages, and the average population lives in rural areas and has a low level of education (Ramadhani & Putra, 2019). Many agricultural workers face difficulties in meeting their daily basic needs due to their low incomes. This situation is caused by the increase in the quantity of labour in the agricultural sector, which does not directly reduce rural poverty. This is due to the lack of increased productivity among these workers. Although the number of workers is increasing, if their productivity does not increase, then their contribution to increasing agricultural production and poverty alleviation will be limited.

Income inequality in rural populations has a significant positive correlation with rural poverty. The findings in this study align with the findings by Arham (2020), who found that inequality or uneven income distribution significantly had a positive impact on rural poverty. High levels of inequality prevent economic growth that can effectively reduce poverty, and increasing inequality can directly increase poverty (Fosu, 2017). Income inequality creates a gap between rich and poor groups, preventing the benefits of economic growth from being evenly distributed across society. In the rural areas, where agricultural workers dominate, many small farmers have narrow and less productive land, while a small number of large farmers possess vast tracts of land. This inequality results in the inability of small farmers to boost their production and income, trapping them in a cycle of poverty.

E. CONCLUSION

The Farmer Exchange Rate (NTP) has a significantly negative correlation with rural poverty. Therefore, a higher NTP indicates that the prices farmers receive are higher compared to the prices they pay for other goods, leading to increased farmer welfare and reduced poverty. The value of agricultural production affects rural poverty because an increase in agricultural production value signals growth in the agricultural sector, which in turn can reduce poverty. Income inequality among rural populations has a significantly positive correlation with rural poverty. This is because inequality leads to the inability of small farmers to enhance their production and income, ultimately trapping them in a cycle of poverty.

Policy implications based on the research suggest the government should maintain its efforts to enhance farmer exchange rates and agricultural production. The government is also advised to reduce income inequality between the agricultural and non-agricultural sectors, such as by expanding market networks.

For future research, it is recommended to collect more detailed data on regional government expenditure in the agricultural sector, by separating allocations into various categories such as expenditure for the development of infrastructures (irrigations or roads) and subsidies. Also, it is suggested to focus on more specific sectors or sub-sectors of agriculture and consider more extended regions or longer time periods.

F. REFERENCES

Alamanda, A. (2020). the Effect of Government Expenditure on Income Inequality and Poverty in Indonesia. *Info Artha*, *4*(1), 1–11. https://doi.org/10.31092/jia.v4i1.614

Arham, M. A. (2020). Does Agricultural Performance Contribute to Rural Poverty Reduction in Indonesia? *JEJAK:Journal of Economics and Policy*, *13*(1), 69–83. https://doi.org/https://doi.org/10.15294/jejak.v13i1.20178

Augustyn, A. (2021). *Keynesian economics*. Encyclopedia Britannica. https://www.britannica.com/money/Keynesian-economics

Central Bereau of Statistics. (2019a). *Data Presentase Penduduk Miskin di Indonesia 2015-2019*. https://www.bps.go.id/id/statistics-table/2/MTkyIzI=/persentase-penduduk-miskin--maret-2019.html

Central Bereau of Statistics. (2019b). *Keadaan Angkatan Kerja di Indonesia*. Central Bereau of Statistics/BPS-Statistics Indonesia.

Central Bereau of Statistics. (2019c). *Profil Kemiskinan di Indonesia Maret 2019*. Central Bereau of Statistics/BPS-Statistics Indonesia.

Baltagi, B. H. (2005). *Econometrics Analysis of Panel Data* (3rd ed). John Wiley & Sons Ltd.

Basuki, A. T. (2015). *Analisis Data Panel dalam Penelitian Ekonomi & Bisnis*. Raja Grafindo Persada.

Cervantes-Godoy, D., & Dewbre, J. (2010). Economic Importance of Agriculture for Poverty Reduction. In *OECD Food, Agriculture and Fisheries Papers* (Issue 23). OECD Publishing. https://doi.org/10.1007/978-3-319-95867-5_124

Chipaumire, G., Ngirande, H., Method, M., & Ruswa, Y. (2014). The impact of government spending on economic growth: Case South Africa. *Mediterranean Journal of Social Sciences*, *5*(1), 109–118. https://doi.org/10.5901/mjss.2014.v5n1p109

Christiaensen, L., Demery, L., & Kuhl, J. (2010). The (Evolving) Role of Agriculture in Poverty Reduction. In *UNU-WIDER Working Paper 2010* (Vol. 36).

Cuong, N. V. (2011). Does Agriculture Help Poverty and Inequality Reduction? Evidence from Vietnam. *Agricultural Economics Review*, *11*(1), 44–56. https://doi.org/10.22004/ag.econ.118576

Etuk, E. A., & Ayuk, J. O. (2021). Agricultural commercialisation, poverty reduction and pro-poor growth: evidence from commercial agricultural development project in Nigeria. *Heliyon*, *7*(5), e06818. https://doi.org/10.1016/j.heliyon.2021.e06818

Fan, S., Gulati, A., & Thorat, S. (2008). Investment, subsidies, and pro-poor growth in rural India. *Agricultural Economics*, *39*(2), 163–170. https://doi.org/10.1111/j.1574-0862.2008.00328.x

Fosu, A. K. (2017). Growth, inequality, and poverty reduction in developing countries: Recent global evidence. *Research in Economics*, *71*(2), 306–336. https://doi.org/10.1016/j.rie.2016.05.005

Hardianty, I., Ahmad, A. A., & Badriah, L. S. (2023). the Influence of Gross Regional Domestic Product on Poverty in Indonesia. *Parameter*, *8*(2), 14–20. https://doi.org/10.37751/parameter.v8i2.245

Horton, M. (2024). *Fiscal Policy: Taking and Giving Away*. IMF.

International Fund for Agricultural Development. (n.d.). *Rural Poverty in Indonesia*. Retrieved July 17, 2024, from https://www.ifad.org/en/web/operations/w/country/indonesia

Kadir, & Amalia, R. R. (2016). Economic growth and poverty reduction: the role of the agricultural sector in rural Indonesia. *Proceedings ICAS VII Seventh International Conference on Agricultural Statistics*, *2017*.

Khan, M. H. (2001). Rural Poverty in Developing Countries: Implications for Public Policy. *International Monetary Fund Economic Issues*, *26*.

Kharisma, B., Wardhana, A., & Hutabarat, A. F. (2020). Pengeluaran Pemerintah Sektor Pertanian, Produksi Dan Kemiskinan Pedesaan Di Indonesia. *Jurnal Ekonomi Kuantitatif Terapan*, *13*(2), 211–228.

Mangkoessoebroto, G. (2002). *Ekonomi Publik*. BPFE.

Mogues, T. (2011). The Bang for the Birr : Public Expenditures and Rural Welfare in Ethiopia. *The Journal of Development Studies*, *47*(5), 735–752. https://doi.org/http://dx.doi.org/10.1080/00220388.2010.509925

Nanhthavong, V., Epprecht, M., Hett, C., Zaehringer, J. G., & Messerli, P. (2020). Poverty trends in villages affected by land-based investments in rural Laos. *Applied Geography*, *124*(April), 102298.

https://doi.org/10.1016/j.apgeog.2020.102298

Nirmala, A. R., Hanani, N., & Muhaimin, A. W. (2016). Analysis of Factors that Affecting Farmers Exchange Rage of Food Crops in Jombang. *Jurnal Habitat*, *27*(2), 66–71. https://doi.org/10.21776/ub.habitat.2016.027.2.8

Prasetyo, P. E., & Cahyani, E. N. (2022). Investigating Keynesian Theory in Reducing Unemployment and Poverty in Indonesia. *Journal of Asian Finance*, *9*(10), 39–48. https://doi.org/10.13106/jafeb.2022.vol9.no10.0039

Purmini, P., & Rambe, R. A. (2021). Labour and Government Policies on Poverty Reduction in Sumatera Island, Indonesia. *Jurnal Ekonomi Pembangunan*, *19*(1), 61–74. https://doi.org/10.29259/jep.v19i1.13775

Ramadhani, F., & Putra, F. S. (2019). Having a Job Is Not Enough to Escape Poverty: Case of Indonesian Working Poors. *IPTEK Journal of Proceedings Series*, *0*(6), 58–64. https://doi.org/10.12962/j23546026.y2019i6.6342

Selvanathan, E. A., Selvanathan, S., & Jayasinghe, M. S. (2021). Revisiting Wagner's and Keynesian's propositions and the relationship between sectoral government expenditure and economic growth. *Economic Analysis and Policy*, *71*, 355–370. https://doi.org/10.1016/j.eap.2021.05.005

Sukirno, S. (2006). *Ekonomi Pembangunan: Proses, Masalah, dan Dasar Kebijakan*. Kencana.

Susilastuti, D. (2018). Agricultural Production and Its Implications on Economic Growth and Poverty Reduction. *European Research Studies Journal*, *21*(1), 309–320. https://doi.org/10.35808/ersj/949

Suwardi, A. (2011). Pengeluaran Pemerintah Daerah, Produktivitas Pertanian, dan Kemiskinan di Indonesia Local Government Spending, Agricultural Productivity and Poverty in Indonesia. *Jurnal Ekonomi Dan Pembangunan Indonesia*, *12*(1), 39–55. https://doi.org/10.21002/jepi.v12i1.04

Tedesco, I., Pelloni, A., & Trovato, G. (2015). OECD Agricultural Subsides and Poverty Rates in Lower Income Countries. *International Journal of Food and Agricultural Economics*, *3*(2), 31–49.

Todaro, M. P., & Smith, S. (2011). *Pembangunan Ekonomi Jilid 1* (11th ed.). Erlangga.

World Bank. (2022). *Poverty and Inequality Platform*. The World Bank.

Appendix

Chow Test

Redundant Fixed Effects Tests
Equation: EQ01
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	108.698823	(7,26)	0.0000
Cross-section Chi-square	136.399767	7	0.0000

Cross-section fixed effects test equation:
Dependent Variable: RURALPOV
Method: Panel Least Squares
Date: 08/01/24 Time: 13:37
Sample: 2015 2019
Periods included: 5
Cross-sections included: 8
Total panel (balanced) observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.16173	21.46120	0.520089	0.6065
LOG(AGREXP)	4.097300	0.933519	4.389089	0.0001
NTP	0.172504	0.078498	2.197562	0.0351
LOG(PRODAGR)	-4.782858	0.859015	-5.567836	0.0000
SHAREAGR	0.538314	0.082910	6.492732	0.0000
SHARELABOR	0.087328	0.058757	1.486267	0.1467
RURALINEQ	-6.322704	16.45840	-0.384163	0.7033

R-squared	0.734992	Mean dependent var	18.13975
Adjusted R-squared	0.686809	S.D. dependent var	4.082329
S.E. of regression	2.284615	Akaike info criterion	4.647900
Sum squared resid	172.2423	Schwarz criterion	4.943454
Log likelihood	-85.95800	Hannan-Quinn criter.	4.754763
F-statistic	15.25408	Durbin-Watson stat	0.586750
Prob(F-statistic)	0.000000		

Hausman Test

Correlated Random Effects - Hausman Test
Equation: EQ01
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	760.494907	6	0.0000

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LOG(AGREXP)	-0.116536	4.097300	0.066620	0.0000
NTP	-0.096877	0.172504	0.001891	0.0000
LOG(PRODAGR)	-7.093694	-4.782858	2.010596	0.1032
SHAREAGR	-0.031482	0.538314	0.002721	0.0000
SHARELABOR	-0.037235	0.087328	0.000427	0.0000
RURALINEQ	9.857261	-6.322704	16.775836	0.0001

Cross-section random effects test equation:
Dependent Variable: RURALPOV
Method: Panel Least Squares
Date: 08/01/24 Time: 13:39
Sample: 2015 2019
Periods included: 5
Cross-sections included: 8
Total panel (balanced) observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	148.9408	23.68889	6.287372	0.0000
LOG(AGREXP)	-0.116536	0.321195	-0.362821	0.7197
NTP	-0.096877	0.046356	-2.089821	0.0466
LOG(PRODAGR)	-7.093694	1.428825	-4.964704	0.0000
SHAREAGR	-0.031482	0.054858	-0.573892	0.5710
SHARELABOR	-0.037235	0.023903	-1.557713	0.1314
RURALINEQ	9.857261	5.304313	1.858348	0.0745

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.991244	Mean dependent var	18.13975
Adjusted R-squared	0.986866	S.D. dependent var	4.082329
S.E. of regression	0.467856	Akaike info criterion	1.587906
Sum squared resid	5.691127	Schwarz criterion	2.179014
Log likelihood	-17.75812	Hannan-Quinn criter.	1.801632
F-statistic	226.4086	Durbin-Watson stat	1.222205
Prob(F-statistic)	0.000000		