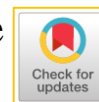# Mitigation of regional poverty in East Kalimantan: A village level panel data analysis

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ABSTRACT

Poverty is a specific problem so that programs that pay attention to spatial or demographic aspects are crucial to being able to create programs that are right on target in alleviating poverty. Apart from looking at demographic factors, we also analyze technological and institutional factors. This research aims to develop a Regional Poverty Mitigation Model in the province of East Kalimantan. This model is designed to provide a comprehensive framework for understanding and addressing poverty in the region. The focus of this research is specifically on the problem of poverty in the province of East Kalimantan. The data used in this study is the latest data from the 2021 Village Potential (Podes) of East Kalimantan province, which includes 1039 villages. The method used in this study is a quantitative analysis method using panel data which is then performed regression. The results show that geographical variables (regional areas and bordering the sea) have a negative and significant relationship to poverty in East Kalimantan, and technology has a positive and significant relationship to poverty in East Kalimantan. In addition, institutions (health and education) have a positive and significant relationship to poverty in East Kalimantan.

1. Introduction

According to the World Bank (2001) poverty is "*Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to go to school and not knowing to know how to read. Poverty is not having job, is fear for the future, living one day at a time. Poverty is losing a child to illness bring about by unclean water. Poverty is powerlessness, lack of representation and freedom*". Poverty is a person's powerlessness in fulfilling the basic needs of life, namely in the aspects: food, housing, education, health, participation in decision making, and freedom. The high rate of poverty in the world, even in Indonesia, is a common problem for all elements of society in the world. The goal of poverty alleviation is stated in the sustainable development goals (SDGs), namely no poverty by 2030. The dimensions contained in development have 5 main foundations in the SDGs, namely people, planet, prosperity, peace and partnership. This is to achieve three main goals by 2030, namely ending poverty, achieving equality and overcoming climate change that is occurring (Ishartono, 2019).

Indonesia's poverty requires policies that are right on target. The problem of poverty is characterized by several things, including the low quality of life of the population, limited adequacy and quality of food, limited and low quality of health services, child nutrition, and low quality of education services (Putri & Yuhan, 2020). The dense population in Indonesia which is not widely distributed affects the economic growth of each region. To equalize the economy in Indonesia and overcome poverty, the initiative taken by the state was to move the country's capital to East

Kalimantan Province. Suripto et al (2024) explain poverty through the Solow-Romet economic growth theory and show that investment in quality of life (such as sufficient calories, healthy food, etc.) and health have an effect on poverty. His research focuses on households that play an important role in overcoming poverty through health.

Research on poverty is important to identify the causes and impacts of poverty on the economy and households (Thane, 2024). Study from Sharma et al (2024) explains that integrating information and communication technologies (ICT) facilities into education and health is an effective policy in reducing poverty. Ipinnaiye & Olaniyan (2023) explain poverty reduction in Nigeria through socially innovative cultural practices such as traditional rotating savings/credit and apprenticeship schemes which help eradicate poverty by ensuring increased financial access and encouraging entrepreneurship so that it becomes more sustainable in reducing poverty rates. Various forms of data on poverty provide a comprehensive picture for policy makers in creating targets and strategies related to poverty alleviation.
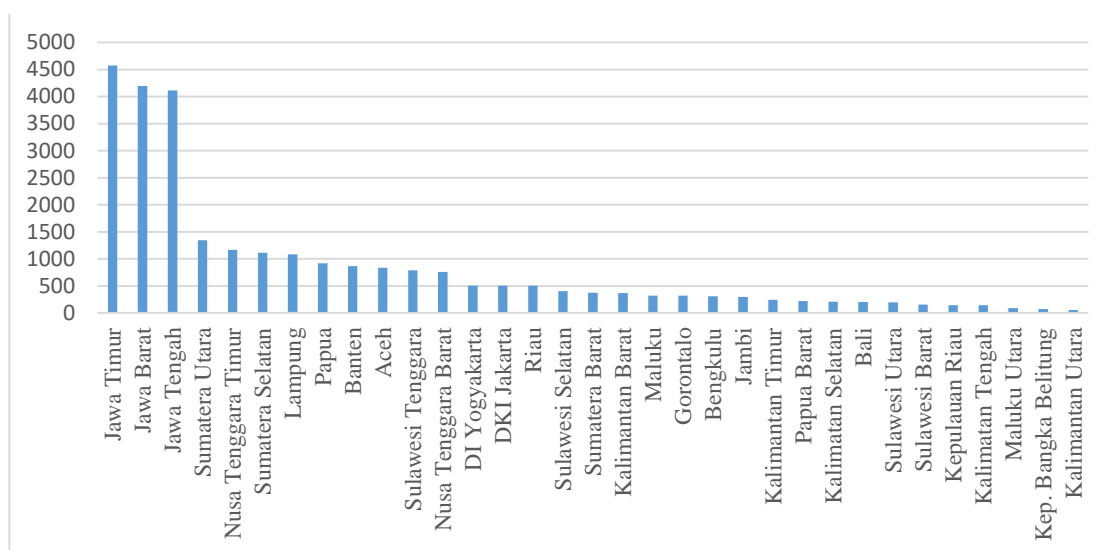

Figure 1. Number of poor by province in 2021

The areas of East Kalimantan province designated as the location for the new capital are Penajam Paser Utara regency and Kutai Kartanegara regency which are part of East Kalimantan Province. The choice of this area has of course been taken into account beforehand. Until now, North Penajam Paser Regency and Kutai Kartanegara Regency have received attention from all groups. There are several reasons why these two places were chosen. One of the reasons why the President moved the country's capital to East Kalimantan was the minimal risk of disasters such as floods, earthquakes, tsunamis, forest fires, volcanoes and landslides. In the province of East Kalimantan, policy interventions by the government tend to have diverse impacts due to the diversity of spatially distributed behavior and varying environmental conditions. The government as a stakeholder emphasizes the need for a spatially disaggregated view that can enable analysis of poverty in the villages of East Kalimantan province. Figure 1 shows that in 2021 there will be 242.000 poor people in East Kalimantan Province. This number is the second largest number of poor people on the island of Kalimantan under West Kalimantan Province.

Niu & Xu (2024) stated that urban-rural integration can reduce absolute poverty and relative income poverty of rural households, the main channel is through rural households' access to health services. In addition, the results of other research show that the age of the head of the household, health, and occupation of the head of the household will influence the impact of urban-rural integration in reducing poverty in rural households. Urban-rural integration and poverty alleviation development efforts need to pay more attention to access to resources and services and implement different policies for each region. Moving the country's capital can also cause urbanization. Arouri et al (2017) stated that the urbanization process drives the transition from agricultural to non-agricultural activities in rural areas. More specifically, urbanization tends to reduce income from the agricultural sector and increase wages and non-agricultural income in rural households. This shows that the total income and consumption expenditure of rural households tends to increase with urbanization.
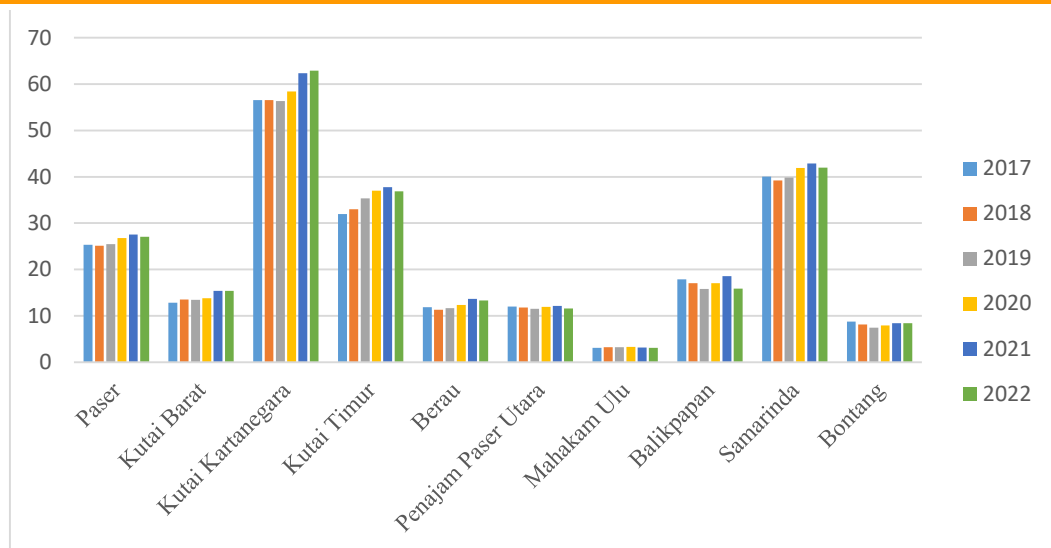
Figure 2. Number of poor by district in 2021

If viewed based on the city where the location was designated as the location of the new capital, over the last 5 years Kutai Kartanegara Regency (Figure 2) has been the district with the highest number of poor people in East Kalimantan Province. If moving the capital is the goal of equalization, then there will be economic growth and changes in the economic structure of the new capital. Az zakiyyah et al (2023) stated that economic growth can reduce poverty rates. Apart from that, there is a need to pay attention to macro policies that can support the relocation of the capital. This can respond to relevant macro policy interventions. Therefore, it is necessary to study important factors for policy actors, namely to avoid poverty spots, which requires explicit spatial simulations (Smajgl & Bohensky, 2013).

Moving the capital city to an alternative province will cause the economy to be more diversified towards more labor-intensive sectors. This is proven by an increase in the price of capital of 0.23 and an increase in the price of labor of 1.37. This is expected to reduce poverty in East Kalimantan and reduce poverty in Indonesia in aggregate. This is in accordance with the goal of sustainable development goals, namely poverty alleviation (Ishartono, 2019). As the location that will be the area for moving the country's capital, the number of poor people in Kutai Kartanegara Regency is a concern for all groups. The plan to move the capital city will have an impact on economic equality, migration flows and internal and external connectivity which will lead to economic development and regional development (Taufiq, 2020).

This research aims to analyze the influence of geography, technology and institutions on poverty at the village level in East Kalimantan. Belantika et al (2023) stated that poverty is a specific problem so that programs that pay attention to spatial or demographic aspects are crucial to being able to create programs that are right on target in alleviating poverty. Apart from the demographic side, research also analyzes the influence of technology on poverty, according to Sharma et al (2024) that information and communication technologies (ICT) facilities for education and health are effective policies in reducing poverty. Diga et al (2013) explained that ICT plays an important role in alleviating poverty through human capital, political and social factors and ICT development must be oriented towards alleviating poverty. The advantage of research is analyzing these two factors at the village level, so as to obtain comprehensive results and become an update to this research.

2. Method

This research was conducted in East Kalimantan province because East Kalimantan province has been designated by the government as the new national capital. East Kalimantan has 10 districts/cities and the number of poor people in districts/cities in East Kalimantan reached 241.77 thousand people. According to the East Kalimantan provincial government, there are 841 villages, 197 sub-districts and 103 sub-districts. The research uses village potential data which then uses panel data and then processes the data through panel data regression. Panel data is a combination of cross section data or data at a certain time which is paired with time series data or time series data. Gujarati (2004) panel data analysis method is used to determine the magnitude of the influence of an independent variable

(independent variable) on the dependent variable (dependent variable). It has many advantages, including being able to provide more information, reducing collinearity between variables, increasing *degree of freedom*, and is more efficient and can minimize bias that may occur when combining individuals or companies into a wider scope. Podes data used for a specific year must be used because this study uses a short panel data period, interpretation of the results of this study must be taken with caution (Purwono et al., 2021).

Based on the data, factors that influence poverty in urban and rural areas will be distinguished. This comparison is important considering that poverty is not only in rural areas, but also in urban areas. Based on this geographical approach, poverty can be distinguished in rural and urban areas. If we look at poverty in rural areas (rural poverty), several factors include limited access to land and irrigation facilities, (ii) adaptation to modern technology that is not fast enough, the burden on large families. Rural poverty is usually located in peripheral areas. The variables used in this research are geographical aspects, technological aspects and institutional aspects. Model I analyzes poverty based on geographic factors with the equation:

$$pov_{it} = \alpha_0 + \beta_1 x1_{it} + \beta_2 x2_{it} + \beta_3 x3_{it} + \varepsilon_{it} \qquad (1)$$

Where pov is the number of poverty, $x1$ are areas such as slopes, valleys and plains, $x2$ is the area bordering the sea and $x3$ is the location of the village in the forest area. Model II analyzes poverty based on technological factors with the equation:

$$pov_{it} = \alpha_0 + \beta_1 x4_{it} + \beta_2 x5_{it} + \beta_3 x6_{it} + \varepsilon_{it} \qquad (2)$$

Where $x4$ are technological variables such as electricity and public street lighting, $x5$ is the use of oil fuel and $x6$ a is the use of home telephones, television and telecommunications signals. Model III analyzes poverty based on government factors with the equation:

$$pov_{it} = \alpha_0 + \beta_1 x7_{it} + \beta_2 x8_{it} + \beta_3 x9_{it} + \varepsilon_{it} \qquad (3)$$

Where $x7$ are economic institutions such as commercial banks and cooperatives, $x8$ are institutional variables such as education and health facilities, $x9$ is access to economic institutions. α_0 is the constanta, $\beta_1 - \beta_3$ is the coefficient of independent variables, ε is the error term, i notation for cross-section and t is the notation for time-series.

3. Results and Discussion

Model I analyzes the influence of geography on poverty. Belantika et al (2023) emphasize that demographic aspects are crucial in being able to create programs that are right on target in alleviating poverty. Table 1 in model I shows that regional conditions such as slopes, valleys and land have no effect on poverty. Meanwhile, geographical variables related to areas bordering the sea have a negative influence on poverty with a probability value of <5 percent. The third variable, namely the location of the village in forest areas such as inner forest, edge forest or outer forest area, has a positive effect on poverty with a probability value of <5 percent. The results of research on geographical factors show that there are differences in the influence of poverty between villages close to the sea and forests, which is a concern that geographical factors with the risk of natural disasters, high land surface temperatures and accessibility to traffic are the government's attention in mapping programs for poverty alleviation (Tian et al., 2024).

Table 1 in model II shows that the technology variables for electricity and public street lighting have a positive and significant relationship with poverty in East Kalimantan. The results of this research are in line with research conducted by Inayatsyah & Zulham (2019) which states that districts/cities that have had electricity both in terms of quality and quantity have faster income growth than districts/cities that have not. The availability of energy, both in terms of quality and quantity, can reduce poverty. The fuel use variable has a negative influence on poverty. In contrast to the results of research by Rozaini et al (2023) in Mabar Hilir Area IV in Medan which stated that the increase in fuel prices had a positive effect on poverty levels, especially in underprivileged family communities. Rising fuel prices have an impact on increasing prices of basic necessities. Other technological variables related to the use of landline telephones, television and telecommunications signals have no effect on poverty at the village level in East Kalimantan.

Table 1. Result of Panel Data

Variables	Coefficient	Variables	Coefficient	Variables	Coefficient
Model I		Model II		Model III	
x1	-38.686 (-1.732)	x4	0.155 (2.009)*	x7	2.485 (2.692)**
x2	-92.348 (-10.513)***	x5	-135.592 (-5.132)***	X8	147.941 (9.691)***
x3	86.697 (10.191)***	x6	-22.382 (-1.106)	x9	-5.936 (-1.010)
C	203.198 (2.427)**	C	754.544 (1.562)	C	-569.067 (-8.573)***

Source: data processed

Institutions have an important role in society. The institutional pattern provided to the community can increase awareness to improve self-quality. So the hope is to escape poverty (Ochi et al., 2024). Economic institutional variables have no effect on poverty at the village level in East Kalimantan. Many of the village residents in East Kalimantan are still unbankable and financial literacy is still low, this means that financial institutions are not yet optimal in East Kalimantan in alleviating poverty. Education and health institutional variables have a positive influence on poverty at the village level in East Kalimantan. A positive coefficient value indicates that education and health institutions have not been able to eradicate poverty because the distance or access to these two institutions is still difficult to reach. Asongu & Kodila-Tedika (2018) explain that the influence of institutions is not strong in alleviating poverty in the short term. In the short term, there is a greater need for institutions that are oriented towards increasing people's income, such as tourism or labor-intensive industries (Zhao, 2021). Meanwhile, institutions for access to economic institutions have no effect on poverty at the village level in East Kalimantan.

4. Conclusion

Poverty alleviation is a program and goal of sustainable development goals (SDGs). The problem of poverty in Indonesia is complex and requires an in-depth analysis of poverty conditions. The research focuses on poverty levels in rural areas in East Kalimantan Province. The choice of research object cannot be separated from the Indonesian government's policy of moving the country's capital to East Kalimantan Province. Moving the capital city to an alternative province will cause the economy to be more diversified towards more labor-intensive sectors. The advantage of research is using podes data which can reach aspects of poverty down to the village level in East Kalimantan. The research results show that geographical variables (regional areas and borders with the sea) have a negative and significant relationship with poverty in East Kalimantan. Technology variables have a positive and significant relationship to poverty in East Kalimantan and institutional variables (health and education) have a positive and significant relationship to poverty in East Kalimantan.

The government can improve and expand the reach and health services to the community, which can be done by expanding the reach of Community Health Insurance (Jamkesmas) and Maternity Insurance (Jampersal) so that health improvements can be carried out evenly. Apart from that, the government needs to carry out regular monitoring and evaluation to ensure that the provision of health subsidies to the community is more targeted. There is also a need for integration in education so that graduates have work skills that are needed in the market so that labor productivity also increases. Addition and implementation of entrepreneurship education in the education system to equip graduates with an entrepreneurial spirit so that they are not dependent on available employment opportunities. There is also a need for coordination between the government and related institutions to improve the quality of use of access to financial services and information technology, communication by reducing barriers both in terms of costs and non-costs, especially for the poor.

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