The determinants of poverty in the West Papua province

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Abstract: Poverty has become a serious development problem, including in West Papua Province. This research has become a fundamental issue because West Papua tends to be difficult to get out of poverty problems, which has the second-highest percentage of poverty in Indonesia. This study aims to analyze the determinants of poverty in West Papua. The dependent variable is poverty, and the independent variables are population density, unemployment, human development index, and the average length of schooling. This research uses multiple regression analysis time series, 11 years period. The finding of this study is that unemployment has a positive and significant effect on poverty. Meanwhile, the human development index and the average length of schooling have a negative and significant effect. The implication is that the human development index and the average length of schooling must be expanded in scope to open access to people living in remote areas. The region's characteristics and the population tend to live in the interior, so accessibility is an important factor in alleviating poverty in West Papua.

Keywords: Poverty; Unemployment; Human Development; Average Years of Schooling

JEL Classification: I30; I32; J64

Introduction

Economic development must generate strong economic growth, reduce poverty and unemployment, and minimize regional income disparities (Todaro & Smith, 2015). Poverty is a global issue that affects many countries, including Indonesia. According to the Statistics Indonesia (2023), poverty is the inability to meet basic food and non-food necessities as assessed by expenditures. Regarding expenditures, the World Bank uses the purchasing power parity (PPP) calculation base for 2017 as its reference point. The World Bank raised the extreme poverty limit from $1.90 per person per day to $2.15 per person per day, or IDR 32,812 per day. This condition affects the growing number of disadvantaged individuals in numerous countries, including Indonesia.

Nurkse (1953) suggests that poverty traps can be mapped from both the demand and supply sides. The demand side highlights that income in developing nations is low due to low production levels and limited market access for diverse goods; as a result, the investment incentive is modest. On the side of the supplier, meager savings
result from limited income, leading to restrictions on investment potential. Poverty represents a multifaceted, interconnected challenge that demands extensive initiatives from the central government down to local communities for resolution. Enhancing the collaboration between government initiatives and policies at different administrative levels or across various sectors should cultivate public trust and enhance communication for delivering prompt feedback.

In 2022, Indonesia had a poverty population of 26.16 million, which constituted 9.5% of the total population. In comparison to the preceding year, there was a 0.6% reduction in the poverty rate (Statistics Indonesia, 2023). Although poverty has decreased due to the country's progress, the gap between these percentages is still small. This shows that government programs aimed at alleviating poverty, such as the Family Hope Program (PKH), the Public Health Insurance Program (Jamkesmas), and educational support programs, have not been operating at their full potential. In order to effectively implement poverty alleviation initiatives and policies in Indonesia, it is necessary to be adaptable to the country's geographical diversity. For instance, when the aid program is extended to all citizens of Indonesia without taking into account the varying price level impacts in specific regions, and given the persistence of regional biases towards urban development, poverty alleviation initiatives in remote regions like Papua and West Papua may experience delays.

West Papua Province is comprised of thirteen districts and cities. In 2022, the Gini index registered at 0.383, confirming disparities in regional development, with an increase from the previous year and surpassing the national average. This uptick in the Gini index suggests a widening income gap among West Papua residents, indicating that higher-income individuals will claim a larger portion of the total income in the population. West Papua Province holds the second-highest poverty rate in the region. The subsequent chart depicts the evolution of poverty levels in West Papua over time.

![The Number of Poor People in West Papua (thousands of people)](image)

**Figure 1** Development of the Number of Poor People in West Papua 2010-2021
Source: Statistics of Papua Barat Province, 2022
Figure 1 illustrates the evolution of poverty rates in West Papua spanning from 2010 to 2021. The population of West Papua stood at 0.765 million people in 2010 and is projected to reach 1.03 million people by 2021, reflecting an average growth rate of 2.7% over the past decade. In contrast, the figures pertaining to the number of impoverished individuals in West Papua in 2010 amounted to 217.43 thousand people, and by 2021, this number is expected to be 219.07 thousand. The most substantial increase in the poverty rate occurred in 2021, at 5%, and this can be partly attributed to a -0.51% decline in economic growth in West Papua. Hill (2021) revealed that changes in the poverty rate are influenced by aggregate economic growth, where the more equitable the income distribution, the lower the poverty rate.

The expansion in the number of individuals living in poverty can give rise to a range of societal challenges, including a reduction in the quality and quantity of human resources, a surge in income inequality and disparate development, disruption of social, economic, and political stability, and an upsurge in crime rates. Poverty in all its forms is a threat to which many nations are susceptible. There is an urgent need to develop, plan, and implement practical poverty alleviation policies. The complexity of poverty is multidimensional, and overcoming it requires focused, planned, and coordinated efforts between various parties. Programs and policies that are both vertically and horizontally integrated are expected to affect sustainable and sustainable reduction.

This study aims to analyze the determinants of poverty in West Papua Province. This study focuses on poverty in West Papua, which has the second-highest poverty rate in the area. It has been rather difficult to escape the complexities of poverty during the past decade. Theoretically, poverty is defined as the inability to fulfill basic needs. Spicker (2007) suggests that the causes of poverty can be classified into four parts, namely 1) individual explanation, personal characteristics; 2) familial explanation, heredity; 3) subcultural explanation, environmental characteristics, and 4) structural explanation, social status.

According to Spicker, the causes of poverty can be categorized into two: oneself and the surrounding environment. The population can positively impact economic growth related to labor productivity. Still, on the other hand, an uncontrolled increase in population that tends to be concentrated in certain areas will raise the problem of poverty. The population continues to change in its development, and there is an inability to meet basic needs. Population change affects poverty; Cruz and Ahmed (2018); Sembene (2015) state that rapid population growth tends to reduce per capita income and welfare growth, impacting poverty. Population density can lead to a long-term decline in education, health, and environmental quality for the next generation. Increasing population has an impact on decreasing employment opportunities; Ramdani (2015); Afolabi and Bobola (2020) revealed that increasing unemployment increases poverty. Corcoran and Hill (1980) revealed that the number of people living in poverty would decrease if unemployment could be reduced. The high population density in an area impacts diminishing employment opportunities, which can further increase unemployment and the poverty rate. Wafiq and Suryanto (2021) revealed that population density in Indonesia has a negative effect on the environment, which will certainly impact increasing poverty. Ilham's (2021) research results obtained that population density has an impact on
reducing the quality of the environment, so it is deemed necessary to carry out policies to balance the distribution of population between regions by opening new economic clusters, supplying labor, and improving the quality of education.

One of the causes of poverty is the low quality of human resources. Statistics Indonesia (2023) measures human development achievements with indicators of health, education, and living standards to obtain the quality of human resources. The link between the quality of human resources and poverty in research conducted by Andhykha et al. (2018) and Zuhdiyaty and Kaluge (2017) confirm that an enhancement in the human development index has an adverse impact on poverty, indicating that as education, healthcare, and overall quality of life improve, poverty rates decrease. The new growth theory underscores the significance of boosting labor productivity by enhancing education and healthcare. Sayifullah and Gandasari (2016), examining poverty, found that the human development index is negatively related to poverty, meaning that an increase in the human development index impacts reducing the poverty rate. The quality of human resources is influenced by the level of education, health, and environmental sanitation because, in its development, good quality human resources will be able to contribute to the regional economy, in this case, producing better productivity compared to human resources with low education levels and poor health quality.

The average number of years spent in education can affect the poverty rate. This number represents the average number of years spent on all levels of education by the population aged 15 and older (Statistics Indonesia, 2023). It can be concluded that the higher a person's level of education, the more positive the impact on their income and welfare. Hadi (2019) revealed that the average years of schooling have a negative impact on the percentage of poor people. The average years of schooling in West Papua in 2021 is 7.69 or below the national average of 9.08, indicating that citizens of the West Papua region require additional learning. The modest average years of schooling in West Papua can be attributed to the demographic makeup, which encompasses remote and challenging-to-reach mountainous areas, leading to a limited understanding of the importance of education. Increased time spent in educational institutions leads to higher levels of education, which, in turn, positively influences income growth and can contribute to the reduction of poverty rates. The contribution of this research is the first step in identifying the phenomenon of poverty in West Papua. The geographical conditions of West Papua tend to be different from other regions in Indonesia, affecting the percentage of poor people so that the handling requires a human side approach. Population density, unemployment, human development index, and average length of schooling have been included in many research models, but in West Papua with a large land area dominantly mountainous where indigenous people live in the interior. This condition also influences the variables in this study. The novelty of this study is that this research introduces a unique aspect by focusing on the demographic distribution in West Papua. Indigenous communities predominantly inhabit mountainous regions, which present challenges in terms of accessibility and can contribute to an elevated overall poverty rate in the province. It's hypothesized that areas with higher population density have lower numbers of residents in mountainous zones, and vice versa. This phenomenon is intricately linked
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to the average length of schooling, where regions with a greater hinterland population tend to have limited access to education.

Research on poverty has been carried out with a variety of influencing variables. The results obtained from the influence of the population density variable on poverty by Wang et al., (2018); Diyanah and Huda (2022) that the poverty level is inversely affected by the population size. Meanwhile, Puspita (2015) reveals that the poverty rate will tend to grow symmetrically as the population increases. The unemployment variable Siregar and Batubara (2022) reveals that the decline in the unemployment rate does not affect the poverty rate. Meanwhile, Loka and Purwanti (2022) revealed that unemployment positively affects poverty. Chen and Tan (2022); Fang and Zhang (2021) state that unemployment negatively affects poverty in the Philippines, as income plays an important role in poverty alleviation. For the Human Development Index variable, Prasetyo and Thomas (2021) revealed that the human development index has a negative effect on poverty. Variable average length of school Diyanah and Huda (2022) found that education did not affect poverty, while Zhang (2021) found that education had a negative effect on poverty. The results of research that tend to differ in location and time make this research different from previous research, given the uniqueness of the region and the indigenous Papuan people generally live in areas that are difficult to reach. This difference is the research gap in this study.

Research Method

This study centers its research on West Papua Province, utilizing time series data from the Statistics Indonesia spanning the period from 2010 to 2021. The multiple linear regression analysis method has several advantages: the application is quite simple but has strong insight and can determine the direction and magnitude of the influence that can be used as an indicator in predicting opportunities and risks. The dependent variable used in this research is poverty, as measured by the number of poor people in West Papua. While the independent variables consist of: a) population density, this variable is included in the model because the more densely populated an area or area is, it will have impact on increasing the poverty rate, measured by the number of people per area (people/km); b) unemployment, is the number of people who are not working or have not worked and even postponed working which has an impact on income levels thereby affecting the level of poverty, measured in units of people; c) the human development index, which is an index number to measure the quality of human development in a region, measured using the human development index number, and; d) average length of schooling, the more people who go to school will have an impact on reducing the poverty rate, this variable is measured by the average population aged 15 years and over for all types of education that have been taken. The regression equation model of this study transformed in the form of a natural logarithm (ln) is as follows.

\[ lnPOV = \alpha_0 + \alpha_1 lnPD + \alpha_2 lnUE + \alpha_3 HDI + \alpha_4 lnAYS + e \] (1)
where: $POV$ is the poverty rate in West Papua Province (people); $PD$ is the population density in West Papua Province (people/km$^2$); $UE$ is the unemployment rate in West Papua Province (people); $HDI$ is the human development index in West Papua Province; $AYS$ is the average years of schooling; $\alpha_0$ is the constant; $\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the regression coefficients, and; $e$ is the error term.

In this study, the regression results obtained will be tested to get the best results. The results were tested with the classical assumption, the heteroscedasticity test, to see the unequal variance of the residuals using the Glejser test. Autocorrelation test to see the correlation between observations using the Breusch-Godfrey LM test and multicollinearity using variance inflation factors to meet the best linear unbiased estimator rules.

**Result and Discussion**

Based on equation (1) in the regression model used, the human development index variable is not transformed as a natural logarithm (ln), considering that a variable is an index number. The regression analysis results of equation (1) can be seen in the following table.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-stat.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnPD</td>
<td>-0.002430</td>
<td>0.005030</td>
<td>-0.483107</td>
<td>0.6438</td>
</tr>
<tr>
<td>lnUE</td>
<td>0.022265*</td>
<td>0.007417</td>
<td>3.001970</td>
<td>0.0199</td>
</tr>
<tr>
<td>HDI</td>
<td>-0.006218*</td>
<td>0.002471</td>
<td>-2.516396</td>
<td>0.0400</td>
</tr>
<tr>
<td>lnAYS</td>
<td>-0.164436*</td>
<td>0.071552</td>
<td>-2.298127</td>
<td>0.0351</td>
</tr>
<tr>
<td>C</td>
<td>7.381711</td>
<td>0.835659</td>
<td>8.833400</td>
<td>0.0000</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.651624</td>
<td>D-W stat</td>
<td>1.887625</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>13.62319</td>
<td>Prob(F-stat.)</td>
<td>0.001647</td>
<td></td>
</tr>
</tbody>
</table>

Source: data processed.
Description: *sig. 5 %.

The estimation results presented in Table 1 indicate that unemployment, the human development index, and the average number of years of schooling considerably impact poverty in West Papua. Unemployment has a positive effect, indicating that an increase in unemployment reduces the number of impoverished individuals. Moreover, noting that the human development index and the average duration of schooling exert adverse influences implies that elevating the human development index and extending the average years of education can potentially reduce the poverty rate in West Papua.

Furthermore, the classical assumption test is carried out to get the best regression results. The results of the classical assumption test can be seen in the following table.
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Table 2 Classical Assumption Test

<table>
<thead>
<tr>
<th>Classical Assumption Test</th>
<th>Heteroscedasticity</th>
<th>Autocorrelation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pers. (1)</td>
<td>1,114</td>
<td>0.323</td>
</tr>
</tbody>
</table>

Source: data processed.

Table 2 shows the heteroscedasticity test using the Glejser test where the chi-square probability results are greater than $\alpha$ 5 percent, meaning there are no heteroscedasticities. The autocorrelation test uses the Breusch-Godfrey LM test, where the results show no autocorrelation. Multicollinearity test using variance inflation factors obtained the value of InPD = 5.43; InUE = 7.17; HDI = 1.39, and; InAYS = 1.87. As the value is smaller than 10, it can be concluded that there is no multicollinearity in the model.

The significance test of the regression coefficient using the t-test at 5% alpha obtained a t-table value of 1.795 and then compared it with the t-statistic value in Table 1. The t-count value in Table 1 shows that the variables of unemployment, human development index, and average years of schooling have a significant effect with a t-count value > t-table. The significance test of the regression coefficient using the F-test obtained the F-table value is 4.066. Additionally, the F-F-statistic value is 13.623, with an F-statistic probability value of 0.001. With that, it can be concluded that all independent variables significantly affect poverty. The R-square value of 65.1 indicates that the model used can explain the variation in the dependent variable.

Gweshengwe and Hassan (2020) stated that poverty is a multifaceted and intricate issue with substantial repercussions. Poverty typically encompasses natural, structural, and cultural dimensions. In West Papua Province, all these forms of poverty tend to be present, owing to its rugged, hard-to-reach mountainous terrain, limited resource availability, and the lack of adequate public infrastructure. Additionally, community customs and cultural practices contribute to the challenge by promoting isolation and rendering the task of enhancing living standards a formidable endeavor.

The results obtained show that unemployment has a significant and positive effect on poverty, indicating that an increase in the number of people who are not working or looking for work or who are temporarily preparing for work affects the increase in the number of poor people in West Papua. Amalia et al. (2018); Marisa (2019); and Irawan (2022) revealed that unemployment is one of the factors that trigger the increase in poverty in Indonesia, so controlling unemployment is important. Research conducted by Siyan et al. (2016); Paul et al. (2018); Papadakis et al. (2020); Ngubane et al. (2023), and Ihensekhien and Miedideke (2023) have established a causal link between unemployment and poverty. They have found that youth unemployment, in particular, has a significant potential to exacerbate poverty levels. As a result, government initiatives aimed at generating employment, promoting labor-intensive industries, and facilitating the acquisition of practical skills can have a beneficial effect in reducing youth unemployment. West Papua’s unemployment rate has risen over the past decade, indicating the necessity for proactive policymaking by regional authorities. Building human resources includes, 1) developing labor productivity through guidance and counseling of work skills, 2)
improving education and skills through work training bodies (BLK), and so on. The focus on improving human resources with better quality and higher competitiveness is expected to increase the level of community welfare to reduce the number of poor people.

The human development index has a significant and negative effect on poverty, meaning that an increase in the index will reduce the number of poor people in West Papua. Amalia et. al. (2018); Ardian and Destanto (2021); Aziza and Ichwan (2021); Irawan (2022), and Solikhin (2022) examine poverty where the results show that the human development index has a negative and significant effect on poverty. Nazah et al., (2021) educated female workers positively and significantly affect long-term female workers' development. This indicates that education in the long term and short term has a significant effect on labor participation. The value of the human development index in West Papua in 2021 of 65.89 is still low compared to the national average of 72.91. The human development index tends to be high in metropolitan regions because they are economic and administrative hubs. Therefore, access to the three main components used as indicators of human development, namely education, health, and decent living conditions, is readily available. The reality is that inhabitants in the West Papua district tend to live far apart and in difficult-to-access mountainous regions. Government actions and programs must be consistently and sustainably executed to reach the unreachable by providing physical aid, such as creating schools in rural areas, and non-physical aid, such as education and health funds, to send teachers and health experts. Develop health infrastructure to improve living conditions.

The average years of schooling have a significant and negative effect on poverty in West Papua, meaning that the higher the level of education of the population, which is reflected by the level of education that has been completed, the lower the number of poor people. The higher the level of education, the wider the opportunity to work. Hadi (2019); Pradipta and Dewi (2020); Hasanah et al. (2021); and Sabrina et al. (2022) revealed that the average length of schooling has a significant effect on poverty where the longer or higher population who have completed education at all types and levels of education, the number of poor people will decrease. Anwar's (2018) research investigated the impact of human capital on driving regional economic growth, revealing that education plays a pivotal role in expediting this process. Recent developments in growth theory emphasize the importance of enhancing human capital quality to boost productivity. Adukia et al. (2020) and Hofmarcher (2021), conducted extensive analyses on the broader role of education in poverty reduction. They highlighted how extended school attendance not only lowers the likelihood of poverty but also enhances knowledge and the overall quality of the workforce.

Meanwhile, Falch et al. (2013); Hillman (2016); Helland and Heggen (2018); and Bruno et al. (2022) explored the significant impact of geographical disparities on educational choices. They found that social mobility and regional variations are key factors in determining educational achievements. Additionally, the proximity of one's upbringing to an educational institution influenced the likelihood of attending that institution, while travel time between home and educational facilities positively influenced graduation
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rates. The average length of schooling in West Papua Province in 2022 was 7.84, while the national average was 8.69. The average number of years spent in school suggests that education investment in West Papua is often low or junior high school level. Accessibility of education in remote locations, particularly in the mountains, where indigenous people tend to reside, is necessary for localized development. Education policies and programs in West Papua ought to take into account the specific geographic and spatial characteristics of the region when aiming to reduce poverty through the management of average school travel time. Extending the reach of education and educational services enhances connectivity, making it more effective in the effort to alleviate poverty.

Conclusion

The results show that unemployment positively and significantly affects poverty in West Papua Province. In contrast, the human development index and average years of schooling have a negative and significant effect. Poverty in West Papua is the second highest in Indonesia; an increase in unemployment will further increase poverty. The value of the human development index and the average length of schooling is lower than the national average, and if these two variables can be improved sustainably, it will reduce poverty.

Addressing poverty issues requires vertical and horizontal, cross-regional, and cross-sectoral synergy. The introduction of the characteristics of the community and the region is unity in making policies, which can support the success of the programs carried out. The characteristics of the community, especially indigenous people who live in mountainous areas, tend to be difficult to develop. The development of adequate education and health infrastructure facilities can help develop insight and knowledge. Ease of access is expected to improve the quality of human resources.

Author Contributions

Conceptualisation, M.A.P.; Methodology, M.A.P.; Investigation, M.A.P.; Analysis, M.A.P.; Original draft preparation, M.A.P.; Review and editing, M.A.P.; Visualization, M.A.P..

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Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.
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