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ANALYSIS OF THE EFFECTIVENESS OF INFRASTRUCTURE DEVELOPMENT ON POVERTY LEVELS IN TANGERANG REGENCY IN 2024

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Abstract: *Poverty is defined as a condition in which a portion of the population lives with a monthly per capita expenditure below the poverty line. Addressing poverty remains a major challenge for sustainable development, and one strategic approach is infrastructure development. This study analyzes the effectiveness of education, health, and transportation infrastructure, as independent variables, in reducing poverty, as a dependent variable, in Tangerang Regency in 2024. The study employs multiple linear regression because it allows the simultaneous examination of the relationship between a single dependent variable and multiple independent variables. The results indicate that the three infrastructure variables simultaneously significantly affect poverty levels, as shown by an F-statistic of 3.572 and a p-value of 0.02813 at the 5% significance level. The coefficient of determination (R^2) of 0.3001 suggests that infrastructure development explains 30.01% of poverty reduction, while other factors influence the remaining 69.99%. However, the partial test results show that none of the infrastructure variables individually has a significant effect on poverty. These findings suggest that infrastructure development contributes to poverty alleviation, though its sectoral impact remains limited. Enhancing equity and improving quality across infrastructure sectors are therefore essential to maximize and broaden its benefits.*

Keywords: *educational infrastructure, health infrastructure, multiple linear regression, poverty rate, transportation infrastructure*

1. INTRODUCTION

Indonesia is the world's largest archipelagic state, comprising more than 17,499 islands and an estimated 2024 population of 282 million [1]. Regional disparities remain a critical issue, as six major islands and thousands of smaller ones spread across 38 provinces face different conditions and challenges. The vast territory and large population complicate equitable development, even though balanced growth plays a vital role in driving economic progress and reducing poverty [2]. Poverty is understood as a condition in which individuals or groups are unable to fulfill their basic rights to sustain and develop a dignified life [3]. It is shaped by natural, economic, structural, social, and cultural factors. Unequal access to infrastructure, basic services, and economic opportunities has resulted in varying poverty rates across regions [4].

To address multidimensional poverty, infrastructure development has become one of the government's primary focuses [5] and [6]. Policies have been designed not only to support business sectors but also to accelerate infrastructure provision, particularly in rural areas [7]. Well-planned infrastructure can stimulate economic growth by generating employment, reducing poverty, and raising household income [8]. Furthermore, access to roads, healthcare facilities, and schools enhances productivity and mobility [9], [10], [11], and [12]. However, infrastructure outcomes have not been evenly distributed nationwide.

Tangerang Regency, located in Banten Province, possesses a relatively strong fiscal capacity to manage its development independently. The region encompasses diverse areas, ranging from industrial zones and urban buffers to coastal communities [13]. Despite ongoing development, poverty remains a persistent challenge. Data from the Central Bureau of Statistics indicate that the number of poor residents declined from 276,330 people (6.93%) to 266,430 people (6.55%) in 2024 [14]. Poverty is defined as living with a monthly per capita expenditure below IDR 595,242, or about IDR 20,000 per day [15]. Although official data show a decline, international institutions argue that government indicators do not fully capture realities on the ground. According to [16],

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reductions in poverty rates do not necessarily reflect improvements in living standards. Sustainable improvements in quality of life rely heavily on the availability of supporting infrastructure for human capital development.

In Tangerang Regency, infrastructure in transportation, education, and healthcare has become a priority to promote social and economic progress. By 2023, road construction reached 992.61 kilometers, or 94.20% of the total network, most of which were in good or fair condition [17]. In education, the "Smart Tangerang" program has expanded school access and improved quality through school construction and scholarship distribution, although disparities remain [18]. In healthcare, the government continues to expand primary facilities and intensify disease elimination programs [19]. Adequate schools and health centers are crucial for fostering a healthy and educated society, thereby improving productivity and reducing poverty. Similarly, adequate road infrastructure enhances mobility, facilitates the distribution of goods and services, and supports balanced regional development [9] [20].

Previous studies affirm the importance of educational and transportation infrastructure in alleviating poverty. They also highlight the need for prioritizing infrastructure investments that are contextually relevant and effective [21]. Other research shows that road networks, health facilities, and schools indirectly reduce poverty by fostering economic growth, as reflected in improvements in the Human Development Index (HDI) [22] and [23].

Against this background, the present study aims to analyze the effectiveness of infrastructure development in reducing poverty levels in Tangerang Regency in 2024. A quantitative approach is adopted using multiple linear regression, a statistical technique for assessing the relationship between one dependent variable and two or more independent variables [23]. This method allows for evaluating the specific contributions of different types of infrastructure. The choice of this method is also supported by previous research in Southeast Maluku Regency, which applied multiple linear regression to assess the impact of infrastructure development on poverty levels [24]. Unlike previous studies, this study applies a multivariate statistical model that controls for simultaneous interactions among variables and focuses on Tangerang Regency in 2024. Accordingly, this study seeks to provide empirical insights into the effectiveness of infrastructure development in reducing poverty in Tangerang Regency.

2. METHODOLOGY

2.1. Research Data

This study employs secondary data, namely data collected and processed by external institutions. The data sources are obtained from the Central Bureau of Statistics (BPS) of Tangerang Regency and the Social Affairs Office of Tangerang Regency. The research is quantitative, with a descriptive-analytical approach. The quantitative method is applied because the study relies on numerical data related to infrastructure development, with variables such as educational, health, and transportation infrastructure, which can be measured objectively and analyzed using statistical techniques. Meanwhile, the descriptive-analytical approach is employed to evaluate the effectiveness of infrastructure development on poverty levels in Tangerang Regency in 2024. Table 1 presents data on poverty levels, as well as educational, health, and transportation infrastructure, for 29 districts of Tangerang Regency.

Table 1. Data

District	Poverty Level	Health Infrastructure	Educational Infrastructure	Transportation Infrastructure
Balaraja	0.013576663	5	68	11
Cikupa	0.014035595	6	116	20
Cisauk	0.027035924	2	40	11
⋮	⋮	⋮	⋮	⋮
Sukamulya	0.017514161	1	53	10
Teluknaga	0.020695955	3	105	17
Tigaraksa	0.02814215	4	115	21

2.2. Research Variable

In quantitative research, defining the research object is an essential step in clarifying the study's focus. The objects of this research are the poverty rate as the dependent variable. Meanwhile, educational, health, and transportation infrastructure are the independent variables.

2.2.1 Dependent Variable

The dependent variable in this study is the poverty rate (Y), which reflects the condition in which individuals are unable to meet basic needs such as food, education, and healthcare [14]. Since poverty data at the sub-district level are not available, this study uses the ratio of poor households to the total population in each sub-district as a proxy indicator. According to the Regulation of the Minister of Social Affairs of the Republic of Indonesia No. 146/2013, the term *poor* refers to individuals who have no income or are unable to secure a decent standard of living [25]. This ratio is considered to represent the poverty rate, as it shows the proportion of the most economically vulnerable population within a sub-district. Moreover, the data are comprehensively available at the sub-district level, thereby supporting a more detailed analysis.

2.2.2 Independent Variable

The independent variable in this study is infrastructure development, defined as basic facilities that support the community's social and economic activities. Infrastructure plays a significant role in reducing poverty by expanding access to public services, improving mobility, and creating local economic opportunities. Infrastructure development is measured through three main indicators:

1) Educational infrastructure (X1), measured by the number of formal schools (elementary, junior high, and senior high schools or equivalent) in each sub-district. A greater number of schools increases access to education, contributing to improved quality of life and poverty reduction [11].
2) Health infrastructure (X2), measured by the number of healthcare facilities such as community health centers (*puskesmas*) and hospitals. Adequate healthcare services help maintain the productivity of poor households and prevent economic burdens caused by health issues [10].
3) Transportation infrastructure (X3), measured by the number of road segments in each sub-district. Road networks enhance interregional connectivity and facilitate access to basic services for people with low incomes [12].

2.3. Research Stages

This study employed Microsoft Excel for data organization and RStudio for multiple linear regression analysis [26]. The analytical procedures were carried out through the following stages:

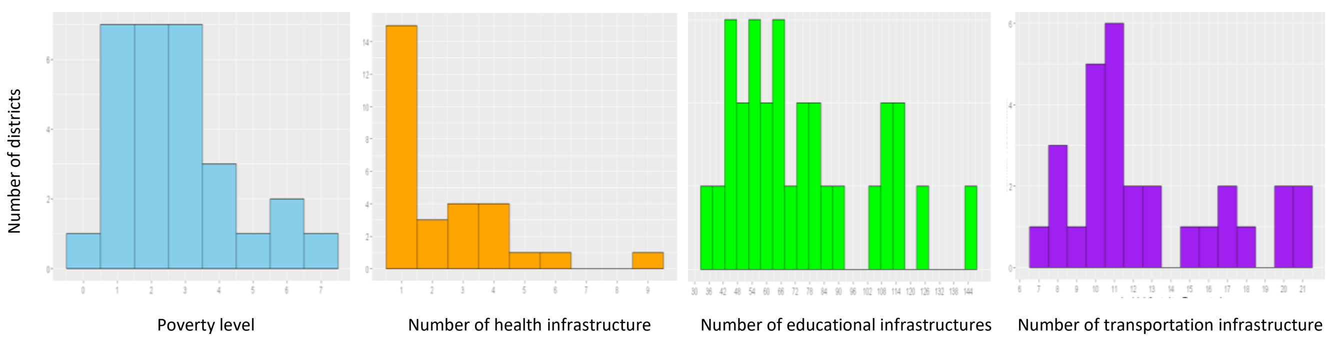
1) Data collection. Raw data were obtained from two official publications: Tangerang Regency in Figures 2025 published by the Central Bureau of Statistics (BPS), and reports from the Tangerang Regency Social Affairs Office. The data, covering each district, included the number of poor households, total population, and the availability of educational, health, and transportation infrastructure. All data were input into Excel for structuring prior to analysis in RStudio.
2) Descriptive statistics and data exploration. Descriptive statistical analysis was conducted to examine the initial characteristics of the variables, including maximum, minimum, mean, median, and standard deviation. This provided a preliminary understanding of both the dependent variable (poverty rate) and the independent variables (educational, health, and transportation infrastructure).
3) Multicollinearity test. The Variance Inflation Factor (VIF) was used to detect multicollinearity among independent variables. A $VIF \geq 10$ indicated strong multicollinearity, requiring potential reduction or exclusion of the variable.
4) Multiple linear regression modeling. A multiple linear regression model was constructed to assess the relationship between poverty and infrastructure indicators.

5) Parameter significance test. Partial (t-test) and simultaneous (F-test) analyses were conducted to evaluate whether each independent variable had a statistically significant impact on poverty.
6) Classical assumption tests. The regression model was tested for normality, autocorrelation, heteroscedasticity, and linearity to ensure reliability.
7) Coefficient of determination. The adjusted R^2 was used to assess the regression model's explanatory power while accounting for the number of independent variables.
8) Conclusion formulation. The final stage involved synthesizing the findings to address the research questions and evaluate the effectiveness of infrastructure development in reducing poverty in Tangerang Regency.

3. RESULTS AND DISCUSSION

3.1. Descriptive Statistics and Data Exploration

The following histogram illustrates the distribution patterns of poverty levels and the development of health, education, and transportation infrastructure across 29 districts in Tangerang Regency.



(a) (b) (c) (d)

Figure 1. The Distribution of Poverty Levels (a) and The Development of Health (b), Education (c), and Transportation (d) Infrastructure Across Districts in Tangerang Regency

The histogram in Figure 1 (a) illustrates the distribution of poverty levels (Y) across 29 districts in Tangerang Regency. The distribution appears to be right-skewed, indicating that most districts experience low to moderate poverty levels, while only a small number of districts face relatively high poverty rates. The histogram further shows that approximately seven districts record poverty levels of around 3%, whereas one district exhibits a poverty rate reaching 7%. The histogram in Figure 1 (b) shows a right-skewed distribution of health infrastructure across districts. This indicates that most districts have a relatively small number of health facilities, while a few districts possess considerably more. Based on the histogram, 14 districts have approximately one health facility, whereas one district, Kelapa Dua, has as many as nine health facilities. The histogram in Figure 1 (c) illustrates a right-skewed distribution of educational infrastructure across districts. This suggests that most districts have a moderate level of educational facilities, while a few districts possess a very high number, pulling the distribution to the right. According to the histogram, approximately 14 districts have between 40 and 70 educational facilities, whereas only one district has the highest number, around 145 units.

Meanwhile, the histogram in Figure 1 (d) shows a right-skewed distribution of transportation infrastructure across districts. This indicates that most districts have a moderate number of road segments, ranging from approximately 9 to 12. According to the histogram, around six districts have 11 road segments. In contrast, a few districts possess a relatively high number of road segments, approximately 18–21. This pattern suggests that, overall, the distribution of transportation infrastructure in Tangerang Regency is uneven, with most districts having a moderate number of roads and only a few districts having a higher concentration.

Furthermore, to provide an overview of the distribution and characteristics of the data, the descriptive statistics of these variables are presented in Table 2.

Table 2. Descriptive Statistics

Descriptive Statistics	Poverty Level	Health Infrastructure	Educational Infrastructure	Transportation Infrastructure
Mean	0.03	2.38	75	12.79
Quartile-1 (Q1)	0.01	1	53	10
Quartile-3 (Q3)	0.03	3	92	16
Minimum value	0.00	1	36	7
Maximum value	0.07	9	144	21
Median	0.02	1	67	11
Skewness	0.98	1.59	0.66	0.68
Kurtosis	0.29	2.47	-0.70	-0.86
Deviation standard	0.02	1.93	28.68	4.20

Table 2 presents the descriptive statistics for all research variables across the 29 districts in Tangerang Regency, including poverty levels and the development of health, education, and transportation infrastructure. The average poverty rate is 3%, with a minimum of 0% and a maximum of 7%, and a median of 2%, indicating that most districts experience relatively low poverty levels. The data are right-skewed (skewness = 0.98), suggesting that a few districts have higher poverty rates, while the standard deviation of 0.02 shows limited variation across districts. Regarding health infrastructure, districts have an average of 2 facilities, ranging from 1 to 9. The median of 1 and right-skewed distribution (skewness = 1.59) indicates that most districts have limited healthcare access, while a few, such as Kelapa Dua, have considerably more facilities. Educational infrastructure averages 75 schools per district, with a minimum of 36 and a maximum of 144. The median of 67 and the right-skewness of 0.66 suggest that most districts have a moderate number of schools, although some districts have substantially more. The standard deviation of 28.68 indicates considerable variation. For transportation infrastructure, the average number of road segments is 12.79, ranging from 7 to 21 segments. The median of 11 and the right-skewed distribution (skewness = 0.68) shows that most districts have a moderate number of roads, while a few districts possess significantly more. The standard deviation of 4.20 reflects moderate variation across districts. Overall, these descriptive statistics indicate that while poverty levels are generally low, infrastructure distribution—particularly health, education, and transportation—is uneven, highlighting disparities in access and availability across districts.

3.2. Multicollinearity Test

To determine the presence of multicollinearity in the regression model, a test was conducted using the Variance Inflation Factor (VIF). The VIF values serve as indicators to detect linear relationships among independent variables, where higher VIF values indicate a stronger likelihood of multicollinearity. This test aims to ensure that the correlations among independent variables are not excessively strong, which could compromise the stability of the regression model. The results of the multicollinearity test using the VIF method are presented in Table 3 below.

Table 3. Variance Inflation Factor (VIF) Value

Variable	VIF	Information
Health infrastructure	1.731304	No multicollinearity
Educational infrastructure	2.093709	No multicollinearity
Transportation infrastructure	2.218127	No multicollinearity

Based on the multicollinearity test results for the three independent variables, all variables have VIF values below 10. Therefore, there is no multicollinearity problem among the independent variables in this model. This indicates that each independent variable provides distinct information and does not overlap with the others, allowing the analysis to proceed to the next stage.

3.3. Multiple Linear Regression Modeling

Multiple linear regression analysis was conducted to determine the extent to which infrastructure development in the health, education, and transportation sectors affects poverty reduction in Tangerang Regency in 2024. The resulting multiple linear regression model is presented as follows.

Table 4. Multiple Linear Regression Coefficients

Coefficients	Estimate	Std. Error	t-value	Pr (>|t|)
(β_0) Intercept	0.0349653	0.0094217	3.711	0.00104
X_1	-0.0036861	0.0018641	-1.977	0.05912
X_2	-0.0002343	0.0001383	-1.694	0.10267
X_3	0.0013819	0.0009732	1.420	0.16796

Based on the Table 4, the obtained regression equation is as follows [27]:

$$\hat{Y} = 0.0349653 - 0.0036861X_1 - 0.0002343X_2 + 0.0013819X_3 \quad (1)$$

with:

$\hat{Y}$: Predicted poverty level

X_1 : Health infrastucture

X_2 : Educational infrastructure

X_3 : Transportation infrastructure

Equation (1) indicates that each type of infrastructure has a distinct impact on poverty levels while holding other variables constant. The constant value of 0.0349653 suggests that without contributions from health, education, or transportation infrastructure, the estimated poverty level is 3%, providing a baseline for understanding poverty conditions in Tangerang Regency. Health infrastructure has a negative coefficient of -0.0036861, implying that an additional unit of health facility reduces poverty by 0.0036861 units, highlighting its role in alleviating poverty. Educational infrastructure also shows a negative effect, with a coefficient of -0.0002343, indicating a smaller but still positive contribution to poverty reduction.

In contrast, transportation infrastructure has a positive coefficient of 0.0013819, suggesting that an increase in road segments is associated with a slight rise in poverty. This may reflect uneven distribution or concentration of transportation development in certain areas, limiting its effectiveness in reducing poverty. Overall, the regression analysis demonstrates that infrastructure development influences poverty levels differently across sectors. The mixture of positive and negative coefficients underscores the varying effectiveness of each type of infrastructure. Residual analysis indicates minimal deviations around zero, supporting the model's reliability in assessing the infrastructure's role in poverty reduction. These coefficients, along with significance tests, form the basis for interpreting the effectiveness of infrastructure development in reducing poverty across districts in Tangerang Regency.

3.4. Parameter Significance Test (T-Test and F-Test)

The parameter significance test determine whether each independent variable (X_i) has a statistically significant effect on the dependent variable (Y). The test is conducted both partially and simultaneously [28]. T-test based on $Pr\ (> |t|)$ value in Table 4. At the 5% significance level, the t-tests result for individual coefficients reveal that none of the independent variables are statistically significant on their own. Specifically, health infrastructure (β_1), educational infrastructure (β_2), and transportation infrastructure (β_3) each exhibit only a marginal influence on poverty reduction. These results suggest that while infrastructure development contributes to poverty alleviation when considered together, the impact of each sector individually is limited. Factors such as equitable distribution, quality of services, and integration with local economic activities likely influence the effectiveness of infrastructure in reducing poverty. Therefore, comprehensive and coordinated development across all infrastructure sectors is essential to achieve a more substantial, and measurable reduction in poverty levels. Based on the t-test results at the 5% significance level, none of the three analyzed infrastructure variables—health, education, and transportation—show a statistically significant effect on poverty levels. Nevertheless, this does not imply that these variables are entirely ineffective; instead, their contributions are relatively limited compared to other factors beyond the scope of this study.

Furthermore, an F-test was conducted to examine the joint effect of the independent variables on poverty level. The F-test determines whether the independent variables collectively affect the dependent variable. In other words, this test assesses whether all independent variables simultaneously affect the dependent variable. Table 5 presents the F-statistic and p-value obtained from the multiple linear regression model.

Table 5. Model Fit Test (F-Test)

F-statistic	Degree of Freedom (DF)	P-value
3.572	3;25	0.02813

Table 5, at the 5% significance level, indicates that the regression model is adequate, as the independent variables are statistically significantly related to the dependent variable. This result implies that the three independent variables simultaneously have a significant effect on poverty levels. Therefore, the regression model employed is considered appropriate to explain the relationship between infrastructure development and poverty levels in Tangerang Regency.

3.5. Classical Assumption Tests

The next stage is the classical assumption testing. This procedure is essential to ensure that the regression model satisfies the fundamental criteria, thereby producing valid and unbiased estimation results. In this study, the classical assumption tests conducted include the normality test, autocorrelation test, heteroskedasticity test, and linearity test.

The normality test was conducted to determine whether the residuals of the regression model are normally distributed. In this study, the Shapiro-Wilk (W) test was employed, supported by the normal QQ plot for visual assessment. The results of the normality test of residuals using the Shapiro-Wilk test are presented in Table 6.

Table 6. Normality Test

Test Statistics (W)	P-value	Information
0.9366	0.08169	residuals are normally distributed

Table 6 shows that the W test statistic is 0.9366, which is close to 1. This result indicates that the residuals approximate a normal distribution, thereby fulfilling the normality assumption of the regression model. Furthermore, Figure 2 presents a normal QQ plot, which is used as supporting evidence for testing the normality of the residuals. The points in the plot are generally aligned with the diagonal reference line, indicating that the residuals follow an approximately normal distribution. This visual inspection reinforces the results of the Shapiro–Wilk test, thereby confirming that the normality assumption is satisfied.

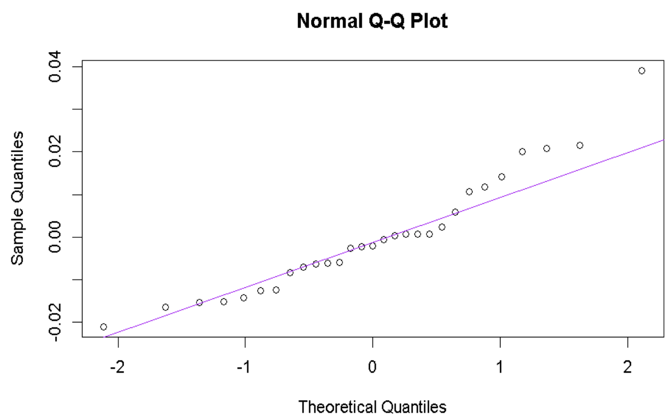


Figure 2. Normal QQ Plot

Figure 2 illustrates that the points in the normal Q–Q plot are dispersed around the diagonal line and largely follow its direction. This indicates that the distribution of the residuals approximates a normal distribution. Although minor deviations appear at the tails, these remain within an acceptable tolerance range and do not exhibit any discernible systematic pattern. Therefore, this visual evidence reinforces the results of the Shapiro–Wilk test, confirming that the residuals of the multiple linear regression model are normally distributed. Consequently, the normality assumption in this study is considered to be satisfied. Subsequently, an autocorrelation test was conducted to ensure that the residuals in the regression model are not correlated with one another. The test was performed using the Durbin–Watson (DW) statistic. The results of the DW test are presented as follows.

Table 7. Autocorrelation Test

Test Statistics (DW)	P-value	Information
2.2383	0.7253	Free autocorrelation

The DW test yielded a value of 2.2383. Since this value is close to 2, the model residuals are free of autocorrelation. To support the autocorrelation test, the following figure is presented.

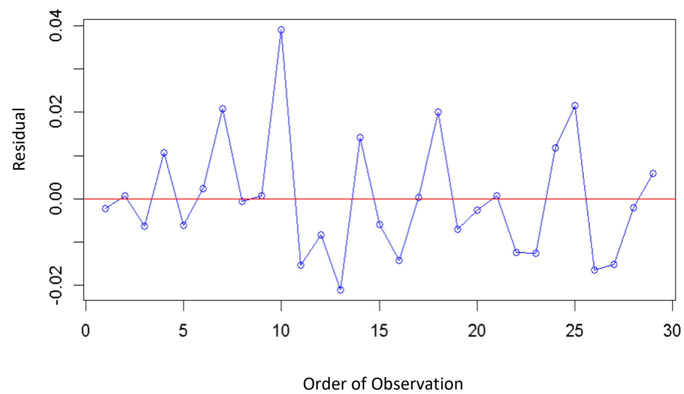


Figure 3. Autocorrelation Test

Figure 3 presents the autocorrelation test by plotting the residuals against the order of observations. The residuals are randomly scattered around the horizontal zero line without forming any systematic pattern. This indicates that there is no autocorrelation present in the regression model. The visual inspection is consistent with the Durbin–Watson test result (DW = 2.2383), which also confirms that the residuals are not correlated.

In linear regression, one essential assumption is homoscedasticity, which means the variance of the error terms (residuals) remains constant across all levels of the predicted values. Conversely, when the variance of the residuals differs across observations, the condition is referred to as heteroscedasticity. To verify this assumption, heteroscedasticity is typically tested by examining the residual scatterplot and using formal statistical procedures such as the Breusch–Pagan (BP) test. The results of the BP test are presented in the following table.

Table 8. Heteroscedasticity Test

Test Statistics (BP)	Degree of Freedom (DF)	P-value
5.9794	3	0.1126

Table 7 indicates that the variance of the residuals in the regression model can be considered constant across all predicted values. This suggests that the regression model satisfies the homoscedasticity assumption and does not exhibit heteroscedasticity. Consequently, the estimated coefficients can be regarded as efficient, and the resulting statistical tests remain valid for analytical purposes. To further support the heteroscedasticity assessment, the following figure is presented.

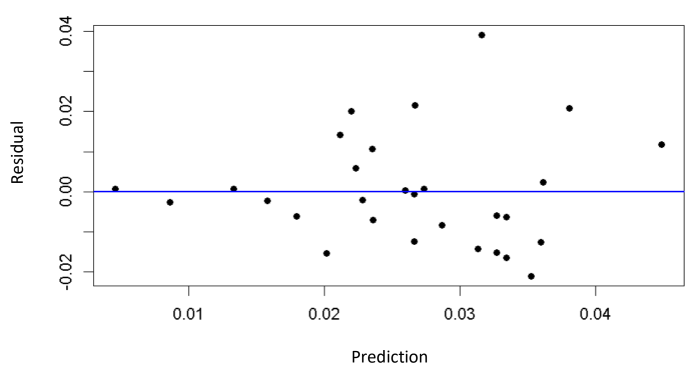


Figure 4. Heteroscedasticity Test

The residuals versus predicted values plot shows that the residuals are scattered around the horizontal zero line in a relatively random pattern. No discernible trend is observed, such as a funnel shape indicating decreasing variance or a widening pattern suggesting increasing variance with higher predicted values. Moreover, the residuals are distributed both above and below the zero line without dominance on either side, indicating no imbalance in variance. This pattern supports the fulfillment of the homoscedasticity assumption, meaning that the variance of the residuals remains constant across all levels of predicted values. Consequently, the regression coefficient estimates are consistent, and the associated statistical tests are more reliable.

The linearity test was conducted to determine whether a linear relationship exists between the independent variables (health, education, and transportation infrastructure) and the dependent variable (poverty level). This test is necessary because the multiple linear regression model requires a linear relationship among the variables. The results of the test using the Ramsey RESET procedure are presented as follows.

Table 9. Linearity Test

RESET	P-value
0,63088	0,5411

Based on Table 9, the linearity assumption is satisfied at the 5% significance level. Thus, the relationship between the independent and dependent variables can be considered linear. To further support the linearity assessment, the following figure is presented.

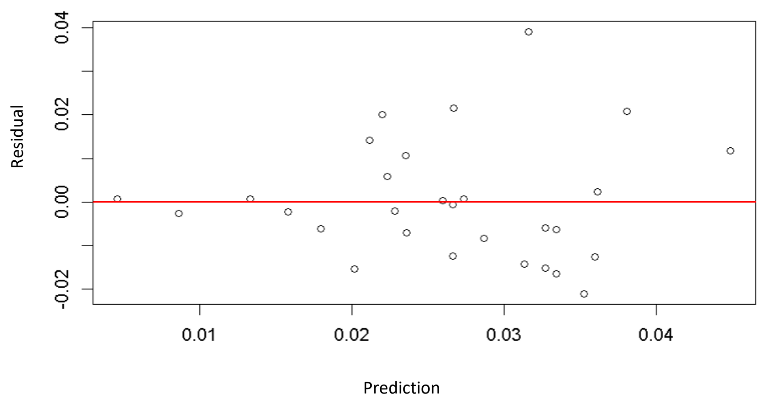


Figure 5. Linearity Test

3.6. Coefficient of Determination

The coefficient of determination test aims to assess how effectively the regression model explains the combined influence of the independent variables on the dependent variable. In simple linear regression, this is indicated by the multiple R-squared value, while in multiple linear regression, it is represented by the adjusted R-squared value. The results of the coefficient of determination test for the regression model used are presented in Table 10.

Table 9. Coefficient of Determination

Multiple R-Squared	Adjusted R-Squared	Std. Error of the Estimate
0.3001	0.2161	0.01451

The coefficient of determination (R^2) obtained is 0.3001, or approximately 30.01%, indicating that variations in poverty levels can be explained by the health, education, and transportation infrastructure variables by 30.01%. Other factors beyond the scope of this study account for the remaining 69.99%. In multiple linear regression, the R^2 value tends to increase with the addition of independent variables, even if the added variables are not statistically significant. Therefore, the adjusted R^2 is used, which accounts for the number of independent variables to provide a more accurate representation of their contribution to the dependent variable. In this study, the adjusted R^2 value of 0.2161 indicates that, after adjustment, the three independent variables collectively explain 21.61% of the variation in poverty levels. In contrast, the remaining 78.39% is affected by other variables not captured in this study. Thus, the coefficient of determination results show that the infrastructure development variables under investigation do influence poverty levels, although their contribution, as reflected by the R^2 value, remains relatively limited.

While the statistical results have been explained, this study's contribution to existing literature also deserves emphasis. Previous studies on the relationship between infrastructure and poverty, such as those examining the impact of infrastructure and economic growth at the national or provincial levels, have generally emphasized macro-scale trends without capturing regional disparities. In contrast, this study contributes by focusing on the regency level, offering a more localized empirical perspective that reflects the specific socioeconomic context of Tangerang Regency.

4. CONCLUSION

This study aims to assess the effectiveness of education, health, and transportation infrastructure development on poverty levels in Tangerang Regency in 2024. Based on the analysis and statistical tests, the conclusions are as follows:

1) The F-test ($p = 0.02813 < 0.05$) shows that education, health, and transportation infrastructure jointly affect poverty levels in Tangerang Regency. The R^2 value of 0.2161 indicates that these variables explain 21.61% of the variation in poverty, while other factors influence 78.39%. This suggests that infrastructure development contributes to poverty reduction, although its effect is relatively limited.
2) The regression coefficient for education infrastructure is –0.0002343 with a p-value of 0.10267, indicating a negative but statistically insignificant relationship. Although an increase in the number of schools tends to reduce poverty, disparities in access and quality limit its effectiveness.
3) Health infrastructure has a regression coefficient of –0.0036861 and a p-value of 0.05912. The negative sign implies a potential poverty-reducing effect, but it is not significant at the 5% level. Unequal distribution of health facilities reduces access to services, diminishing their overall impact.
4) The regression coefficient for transportation infrastructure is 0.0013819 with a p-value of 0.16769, showing no significant effect. The positive coefficient does not imply that poverty increases; instead, it suggests that road development in 2024 has not yet produced measurable short-term benefits.
5) Infrastructure development plays a supportive, rather than dominant, role in reducing poverty in Tangerang Regency. Its effects may take longer to become significant. Future studies should include broader socioeconomic variables and longitudinal data to capture the long-term impact of infrastructure investments better.

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