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Original Article

The Effect of Total Population and Education toward Income Inequality: A Panel Study in Urban Regions, Indonesia

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Abstract: Income inequality is a significant socio-economic issue in urban areas of Aceh Province, despite the region experiencing rapid economic growth. This phenomenon challenges social welfare and equitable access to economic opportunities, particularly amid a rising population and efforts to improve education quality. Previous studies suggest that population and education can influence income distribution; however, the findings remain mixed, and the local context of Aceh has not been thoroughly examined. Consequently, there is a research gap regarding the impact of demographic and educational factors on income inequality in Aceh's urban areas. This study utilizes panel data from 2010 to 2022, encompassing the total population, education, and income inequality. Data were obtained from the Central Bureau of Statistics (BPS) and other secondary sources. The analysis employs Panel Least Squares, selecting a Random Effects model based on Chow, Hausman, and Lagrange Multiplier tests, which is considered the most suitable approach for capturing interregional variations. The results indicate that the total population has a positive and significant impact on income inequality, suggesting that population growth intensifies competition for jobs and resources, thereby widening income disparities. Additionally, education, as represented by the average years of schooling, shows a positive but non-significant coefficient, indicating that improvements in formal education have not yet directly reduced inequality. This study highlights the significance of demographic management and inclusive education policies in mitigating income disparities. The findings carry policy implications for local governments in designing more equitable and sustainable economic development strategies.

Keywords: Income Inequality; Total Population; Education; Panel Data Approach; Aceh Province.

1. Introduction

Income inequality has become an urgent socio-economic issue globally (Riyadi, 2024), including in Indonesia. Although Indonesia has experienced significant economic growth over the past 15 years, its benefits have been distributed unevenly, particularly favoring elite groups (De Silva & Sumarto, 2014). This situation has fostered a strong public perception of unfairness in income distribution. Inequality is reflected not only in the gap between high- and low-income groups (Shinetiara & Adry, 2023) but also exacerbates social problems such as poverty and limited access to education and healthcare services (Arif & Wicaksani, 2017). Aceh Province, endowed with abundant natural and cultural

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resources, also faces serious challenges regarding income inequality, especially in urban areas. Cities such as Banda Aceh and Lhokseumawe show stark disparities between economic growth centers and peripheral regions (Risnasari et al., 2022). Key factors contributing to this inequality include: (1) uneven access to education, (2) rapid population growth, and (3) concentrated investment in urban areas (Violin & Lutfi, 2022).

Significant differences in infrastructure development and public services between cities and rural areas further complicate urban inequality in Aceh. High-income groups tend to have better access to various facilities, while low-income groups are often trapped in cycles of poverty (Banerjee & Duflo, 2007; De Schutter et al., 2023; Satterthwaite, 2004). This study focuses on urban areas because the dynamics of inequality in these regions provide a comprehensive picture of the effectiveness of existing development policies. The study aims to analyze the influence of demographic factors (total population) and human capital quality (educational attainment) on income inequality in Aceh's urban areas. The findings are expected to provide targeted policy recommendations, such as strengthening vocational education, developing micro, small, and medium enterprises (MSMEs), and promoting more equitable investment, to foster more inclusive and sustainable economic growth in Aceh Province.

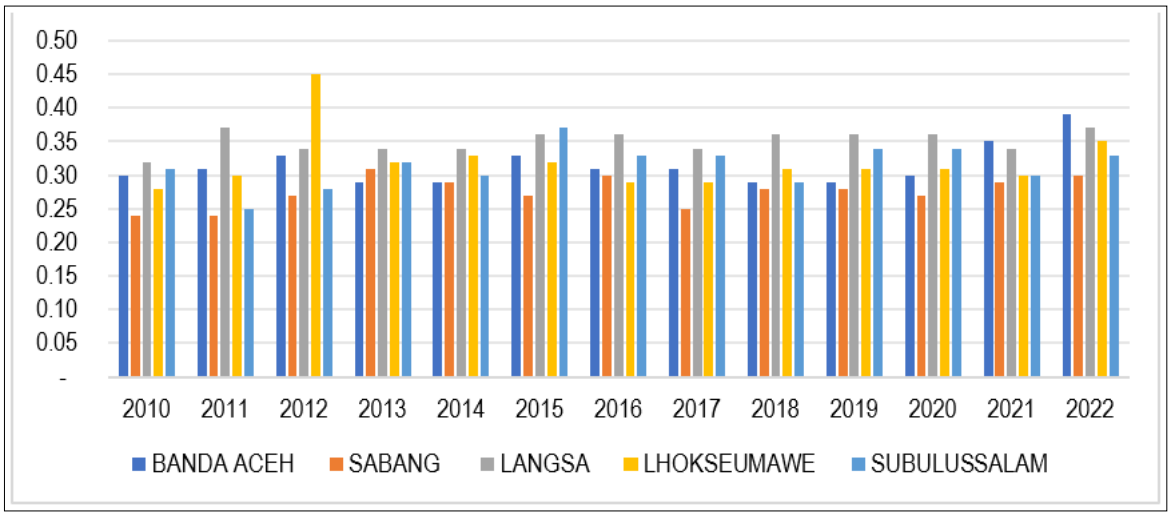

Figure 1. Gini Ratio in Aceh Province, 2010–2022

Source: Badan Pusat Statistik (2024)

Figure 1 illustrates the fluctuations in income inequality in Aceh from 2010 to 2022, with the highest peak observed in Lhokseumawe City in 2012, as reflected by the Gini Ratio. As an indicator of inequality, a Gini Ratio of 0 represents perfect equality, while a value of 1 indicates maximum inequality, with higher values reflecting wider income disparities. This pattern of inequality is closely linked to demographic dynamics in Aceh. The province has experienced stable population growth accompanied by massive urbanization, where the growth rate of urban populations surpasses that of rural areas. This situation pressures limited economic resources, triggering uneven competition for employment opportunities and ultimately widening income gaps. Furthermore, high birth rates among low-income communities, if not accompanied by improvements in living standards, have the potential to exacerbate structural poverty (Suhandi et al., 2018). As Matondang (2018) argues that uncontrolled population growth without corresponding increases in productivity can reduce per capita income and exacerbate inequality.

On the other hand, education emerges as a crucial factor in addressing inequality. Education enhances individual competencies as a form of human capital, making people more adaptable in a competitive labor market (Suaidah & Cahyono, 2013). Educated individuals exhibit higher labor productivity (Deswanti et al., 2023) and possess better problem-solving skills and broader access to basic services. However, the effectiveness of education in reducing inequality heavily depends on the quality and relevance of curricula to labor market needs (Hindun et al., 2019). Fithrian et al. (2015) emphasize the need to improve education quality in conjunction with social protection programs for marginalized groups. In this context, the present study aims to analyze the influence of population and education on income inequality in urban areas of Aceh. The focus on urban regions is chosen because of their complex characteristics and role as a benchmark for the success of regional economic development.

2. Literature Review

2.1. Underlying Theory

Income inequality reflects the uneven distribution of income within society, where certain groups disproportionately control economic resources while others struggle to meet their basic needs (Farahita & Nurhayati, 2025). This phenomenon creates an economic divide between high- and low-income groups, potentially threatening social stability

and economic growth. The theory of income inequality identifies two key factors: population and education. Uneven population growth relative to available employment opportunities can lead to labor surplus, particularly in urban areas that serve as migration destinations. This situation intensifies job competition, suppresses wages, and widens inequality (Kannappan, 1985; Perrons, 2009; Williamson, 1988). Meanwhile, educational disparities directly contribute to skill gaps, as highly educated groups often secure higher-paying jobs, while less-educated groups are frequently trapped in informal employment with minimal wages (Romi et al., 2021).

Consequently, income inequality is not only an economic issue but also a source of social dissatisfaction, necessitating integrated policies such as equitable access to education and the creation of quality employment opportunities. The specific context of urban Aceh exhibits a similar pattern, where income inequality is reflected in stark differences in access to economic opportunities (Nurlina & Chaira, 2017). Uncontrolled urbanization exacerbates the situation, as migration flows into cities are not matched by an expansion of labor market capacity. As a result, residents with limited skills, primarily from low-income groups, struggle to compete and are often confined to low-wage jobs. Meliza & Murtala (2020) highlight that low human capital quality is a root cause of inequality in Aceh. Investment in education and vocational training is crucial to breaking this cycle while promoting inclusive economic growth. Thus, the literature emphasizes that addressing income inequality in Aceh requires a multidimensional approach that simultaneously targets demographic factors and the quality of human capital.

2.2. Total Population

The total population refers to the number of individuals residing in a specific area, whether at the national, regional, or local level. Demographic dynamics have a significant impact on public policy, resource allocation, and economic growth. Simon (as cited in Masniadi, 2012) emphasizes that the population should not merely be seen as a burden but as a potential resource capable of driving innovation and economic development. According to Simon, population growth can stimulate creativity and lead to innovative solutions for socio-economic challenges. However, Simon also warns that population growth may exacerbate income inequality if there is inadequate job creation. Conversely, several studies highlight the risks associated with uncontrolled population growth. Azulaidin (2021) points out that a high population growth rate can hinder economic development without expanded employment opportunities. This situation places pressure on the labor market and widens income gaps. Uneven urbanization further aggravates the issue, as migration to urban areas often does not match sufficient job absorption (Matondang, 2018). Consequently, unemployment becomes concentrated in urban areas, while income disparities between rural and urban regions widen.

2.3. Educational

Human Capital theory posits that increasing education enhances individuals' work skills and income potential. Each additional year of schooling contributes to higher productivity, albeit at the cost of delayed short-term earnings. Therefore, education is a crucial investment for both individuals and society, as it shapes the quality of the workforce and influences income distribution. Education imparts knowledge and skills, serving as a form of capital that enables individuals to compete in the labor market. Income inequality tends to decrease when access to education is managed fairly and equitably. Conversely, uneven distribution of educational opportunities can exacerbate disparities. Several studies indicate that, while education is generally expected to reduce inequality, increases in educational attainment in some regions have been positively correlated with income disparity. Furthermore, formal education is regarded as a long-term investment. Highly educated graduates typically enjoy broader employment opportunities due to their relatively limited numbers, giving them more substantial competitiveness in the labor market. This results in lower unemployment rates among highly educated groups than those with lower education levels. However, as the number of university graduates rises, job competition becomes increasingly intense. Arifin & Firmansyah (2017) found that education has a positive impact on income, with individuals possessing higher education earning higher revenues. Nonetheless, high income is not solely the outcome of educational investment; other complex factors also influence it. The importance of high-quality education aligned with labor market needs is further emphasized by Purba et al. (2024). Relevant education produces skilled, innovative, and productive human capital, ultimately fostering economic growth, expanding employment opportunities, and increasing societal income. Thus, equitable and inclusive education plays a crucial role in enhancing the quality of life, reducing poverty, and bolstering national competitiveness.

2.4. Relationship among the studied variables

2.4.1. Total Population and Income Inequality

Empirical research shows that population growth can have a dual impact on income inequality. On the positive side, an increasing population can expand the labor market, broaden the market for goods and services, and stimulate economic growth. Bigsten & Levin (2004) emphasized that a growing population, if managed effectively, can create new employment opportunities and boost consumption, thereby contributing to income distribution (Bergström, 1997).

Similarly, Wahyuni & Andriyani (2022) highlighted that a larger population can expand markets and attract new investment, which may reduce disparities if accompanied by equitable economic policies. Bloom & Freeman (1986) add that population growth can act as a balancing factor when coupled with improvements in productivity and equal access to employment. However, many other studies point to negative effects. Gersbach (1999) found that population increases intensify competition in the labor market, widening income gaps. Kentor (2001) also warned that population growth will exacerbate income distribution issues unless improvements in economic quality are made. Likewise, Wahyuni & Andriyani (2022) emphasized the strain on local resources caused by population surges, which worsens inequality when economic growth cannot absorb additional labor. Telaumbanua et al. (2024) even show that the total population in Sumbawa Regency has no direct significant effect but can potentially increase inequality in the long term. Castles (2011) further noted that labor surpluses, particularly those resulting from migration, can exacerbate inequality as more individuals compete for limited job opportunities. Thus, the effect of total population on inequality is highly contextual. If accompanied by job creation and inclusive economic policies, population growth can have positive effects. Conversely, without proper management, an increasing population can exacerbate income disparities.

2.4.2. Education and Income Inequality

Similar to the total population, education also has a strong influence on income inequality. On the positive side, education is believed to reduce disparities by providing individuals with the skills, knowledge, and better employment opportunities. Sari et al. (2021) found that higher educational levels increase individuals' chances of earning an income independently, thereby narrowing the gaps. Hindun et al. (2019) also emphasized the role of education in expanding skills, enhancing earnings, and promoting long-term income distribution. Similar findings by Nuraini (2017) and Walker et al. (2019) suggest that investment in education can increase productivity and reduce inequality when implemented equitably. However, several studies highlight the potential negative effects of education. Istikharoh et al. (2020) demonstrate that higher educational attainment may be correlated with increased inequality, as many middle- and high-level graduates remain unemployed due to mismatches between their skills and labor market needs. Jamison et al. (2007) even found that average years of schooling have no significant effect, indicating that educational improvements do not necessarily translate directly into better income distribution. Hindun et al. (2019) also note that the high cost of education can pose a barrier for low-income groups, widening the inequality gap. Nuraini (2017) notes that the low proportion of the population with secondary or higher education reflects limited access, which further contributes to income disparities. Thus, education has a dual role in influencing income inequality. When access to quality education is equitable and aligned with labor market needs, education can serve as an important instrument to reduce disparities. Conversely, if access is limited or education is misaligned with economic demands, it may exacerbate income inequality.

3. Materials and Methods

This study focuses on analyzing income inequality in the urban areas of Aceh Province, namely Banda Aceh, Sabang, Langsa, Lhokseumawe, and Subulussalam. These locations were selected due to their pronounced income disparities amid rapid but uneven economic growth. Examining this phenomenon is crucial, as inequality poses economic challenges and has implications for social welfare. The study utilizes secondary data spanning the period from 2010 to 2022. Data were obtained from various official agencies, particularly the Aceh Provincial Statistics Bureau (BPS), as well as from supporting sources, including relevant journals. The information collected includes total population, education, and income inequality. The dataset is structured as panel data, combining cross-sectional data (multiple units observed at a single point in time) and time-series data (a single unit observed over multiple periods). To analyze the relationships among variables, this study employs multiple linear regression. This approach aims to measure the extent to which independent variables, such as total population and education (average years of schooling), influence the dependent variable, namely income inequality. Using multiple linear regression enables the analysis to identify the simultaneous contributions of each factor and predict the value of the dependent variable. The basic regression model used in this study is expressed as follows:

$$KP_{it} = \alpha + \beta_1 JP_{it} + \beta_2 RLS_{it} + \varepsilon_{it} \quad (1)$$

Whereas, KP = Income Inequality; JP = Total Population; RLS = Average Years of Schooling; α = Constant; β = Regression Coefficient; i = Cross-section; t = Time Series; ε = Error Term.

A series of model selection tests was conducted to obtain the most appropriate panel data model. First, the Chow Test is used to determine whether to choose between the Common Effect Model (CEM) and the Fixed Effects Model (FEM). If the F-test probability is greater than 0.05, the CEM is selected; otherwise, if it is less than 0.05, the FEM is chosen, followed by the Hausman Test. Second, the Hausman Test compares the FEM and the Random Effect Model (REM). If the p-value is greater than 0.05, the REM is more appropriate; if it is less than 0.05, the FEM is selected. Third, the Lagrange Multiplier (LM) Test determines whether the CEM or REM is more suitable. If the LM statistic is smaller than the critical chi-square value, the CEM is used; if larger, the REM is chosen.

4. Results

Descriptive statistics are used to present and explain data in a clear and understandable manner. The primary purpose is to provide an overview of the characteristics of a particular dataset. Methods such as tables, graphs, and statistical measures, including the mean, median, and mode, can be employed to make complex information more comprehensible. According to Leão et al. (2024) mentioned that descriptive statistics play a crucial role in data analysis by providing context and structure to the data, aiding in planning and decision-making.

Table 1. Result of Descriptive Statistics

Statistics	Total Population	Average Years of Schooling	Income Inequality
Mean	134.727	10.304	0.315
Median	156.505	10.530	0.310
Maximum	270.321	13.030	0.450
Minimum	16.589	6.300	0.240
Std. Dev.	83.917	1.804	0.037
Skewness	0.038	-0.869	0.596
Kurtosis	1.533	2.913	4.347

Table 1 shows that the population has a mean of 134,727 individuals, with a median of 156,505. It indicates that half of the study areas have a population below 156,505, while the other half have a population above this figure. The maximum population reaches 270,321, whereas the minimum is only 16,589, reflecting a substantial regional disparity. The standard deviation of 83,917 indicates a relatively high variation in the total population. The population data distribution has a positive skewness of 0.038, suggesting a fairly symmetrical distribution with a slight right skew. At the same time, the kurtosis of 1.533 is lower than the normal value (3), indicating a flatter (platykurtic) distribution compared to a normal distribution. The average years of schooling show a mean of 10.304 years with a median of 10.530 years. It implies that most of the population has completed more than 10 years of education, equivalent to lower- to upper-secondary schooling. The maximum years of schooling reach 13.030, while the minimum is 6.300, indicating a fairly wide educational disparity among the study areas. The standard deviation of 1.804 suggests a moderate level of variation.

The schooling distribution has a negative skewness of -0.869, indicating a leftward skew, where most values are higher than the mean. The kurtosis value of 2.913 is close to the normal value (3), suggesting that the distribution of schooling is approximately normal. Meanwhile, income inequality, measured by the index, has a mean of 0.315 with a median of 0.310, indicating a moderate level of inequality. The maximum value reaches 0.450, and the minimum value is 0.240, indicating variation in inequality across regions, ranging from relatively low to fairly high. The standard deviation of 0.037 indicates that the variation in inequality between regions is relatively small. The income inequality distribution exhibits a positive skewness of 0.596, indicating a rightward skew, with some areas displaying relatively high levels of inequality. The kurtosis value of 4.347 is greater than 3, indicating a leptokurtic distribution that is sharper than a normal distribution. This means that most values are concentrated around the mean, with some outliers at higher levels of inequality.

Table 2. Result of Model Selection for the Best Model

		Statistics	df	Prob
Chow Test	Cross-section F	4.997	5.57	0.001
	Cross-section Chi-Square	23.627	5	0.000
Hausman Test	Cross-section random	1.921	2	0.382
LM Test (Breusch-Pagan)	Cross-section	14.208		0.000
	Test Hypothesis	0.010		0.918

Table 2 presents the results of the panel data model selection tests, revealing several key findings. First, the Chow Test, conducted to compare the Common Effect Model (CEM) with the Fixed Effect Model (FEM), yielded an F-value of 4.997 with a probability of 0.001 and a Chi-square value of 23.627 with a probability of 0.000. Since these probabilities are less than the 5% significance level (0.05), the null hypothesis that the CEM is more appropriate was rejected. Thus, the Chow Test results indicate that the FEM is more suitable than the CEM. Next, the Hausman Test was used to determine which model, FEM or the Random Effect Model (REM), was better. The test produced a statistic of 1.921

with 2 degrees of freedom (df) and a probability of 0.382. Because the probability exceeds 0.05, the null hypothesis cannot be rejected, indicating that the REM is more appropriate than the FEM.

Finally, the Breusch-Pagan Lagrange Multiplier (LM) Test was performed to compare the REM with the CEM. The test yielded a statistic of 14.208 with a probability of 0.000, which is significant at the 5% level. Consequently, the null hypothesis that the CEM is more appropriate was rejected, confirming that the REM is the better model. Overall, the results of these three tests consistently indicate that the Random Effect Model is the most suitable for analyzing the panel data in this study. It implies that the variations across cross-sectional units in the dataset are largely random and uncorrelated with the independent variables, making the REM the most efficient approach.

Table 3. Hypothesis Testing

Variable(s)	Coefficient	Std. Error	t-statistics	Prob.
C	0.266134	0.051117	5.206	0.000
Total Population	2.50E-07	8.44E-08	2.968	0.004
Average Years of Schooling	0.001486	0.005513	0.269	0.789
R-squared	0.396		Mean dependent var	0.315
Adjusted R-squared	0.322		S.D. dependent var	0.037
S.E. of regression	0.031		Akaike info criterion	-4.007
Sum squared resid	0.054		Schwarz criterion	-3.739
Log Likelihood	138.211		Hannan-Quinn criterion	-3.901
F-statistics	5.336		Durbin-Watson stat	2.045
Prob.	0.000			

Dependent Variable: Income Inequality

Table 3 presents the results of hypothesis testing using the Panel Least Squares method, with income inequality as the dependent variable, revealing several significant findings. The constant (C) has a coefficient of 0.266, a t-statistic of 5.206, and a probability of 0.000, indicating that the baseline model contributes positively and significantly to variations in income inequality. The population variable has a coefficient of 2.50E-07, a t-statistic of 2.968, and a p-value of 0.004, indicating a positive and statistically significant effect on income inequality at the 1% significance level. It indicates that the larger the population, the higher the level of income inequality in the study areas. Conversely, the average years of schooling variable shows a positive coefficient of 0.001486, a t-statistic of 0.269, and a probability of 0.789. Since the probability is much greater than 0.05, this variable is not statistically significant in affecting income inequality. In other words, despite increases in formal education, in the context of this study, higher average years of schooling have not directly reduced or influenced income distribution disparities.

Regarding model fit, the R-squared value of 0.396 indicates that approximately 39.6% of the variation in income inequality can be explained by the total population and average years of schooling, while other factors outside the model account for the remaining 60.4%. The Adjusted R-squared value of 0.322 reinforces that the model has a moderate explanatory power. The overall model significance, indicated by an F-statistic of 5.336 with a probability of 0.000, shows that the model is significant at the 1% level, meaning the independent variables collectively explain variations in income inequality. Additionally, the Durbin-Watson value of 2.045 suggests that there are no serious autocorrelation issues in the model, supporting the reliability of the estimates. Information criteria, such as Akaike (-4.007), Schwarz (-3.739), and Hannan-Quinn (-3.901), all of which are negative, also indicate that the model is relatively efficient. Overall, these findings suggest that the total population is a significant factor in increasing income inequality, whereas the average number of years of schooling has no substantial effect. It suggests that the dynamics of inequality are more influenced by demographic and structural factors than by improvements in formal education..

5. Discussion

5.1. The Effect of Total Population and Income Inequality

This study found that the total population has a significant impact on income inequality in the urban areas of Aceh Province from 2010 to 2022. This finding aligns with Kuznets' theory, which posits that in the early stages of economic growth, population and economic activity increases tend to be accompanied by rising income inequality. It occurs because income distribution is inequitable, and the labor market is still in its early stages of development. As a result, growing demand and competition for employment cannot be managed optimally. The effect of total population on income inequality is positive, meaning that the larger the population, the higher the level of income inequality. A high population indicates that a substantial segment of the population cannot meet their basic needs with their income. This condition is a significant factor contributing to the widening of income disparities. In other words, the higher the number of people living in poverty, the greater the regional income inequality. These results are consistent with Firdaus &

Hasmarini (2023), who found that populations unable to meet their living needs contribute to broader economic gaps. Therefore, population growth not accompanied by equitable employment opportunities and income improvements will exacerbate income inequality in urban areas.

5.2. The Effect of Education and Income Inequality

This study found that education level affects income inequality in the urban areas of Aceh Province during the period 2010–2022. Theoretically, education plays a crucial role in human capital development. However, in the early stages of development, increased access to education does not automatically reduce inequality because its distribution is uneven and may not yet align with labor market needs. Inequality theory suggests that as quality education becomes more widely accessible and skills improve, income distribution tends to improve, reducing inequality (Becker, 1964). Barro (2000) highlights that the expansion of secondary and tertiary education in developing countries contributes to a reduction in income inequality over time. This finding suggests that higher levels of education, beyond primary schooling, play a crucial role in fostering more equitable income distribution by enabling broader access to skilled employment opportunities.

However, Hanushek & Woessmann (2007) argue that the quality of education carries greater significance than the mere number of years spent in school. They emphasize that improvements in cognitive skills and learning outcomes exert a stronger and more direct impact on reducing inequality compared to simple increases in enrollment rates. Taken together, these perspectives imply that policies aimed at reducing income disparities should not only focus on expanding access to higher levels of education but also ensure that the quality of instruction and learning outcomes are sufficiently high to equip individuals with the skills demanded by modern labor markets. Nevertheless, the results of this study show that increases in education level have not had a significant impact on income equality. Although education has a positive correlation with inequality, this effect is not statistically significant.

In other words, education as a variable does not have a clear or consistent impact on reducing inequality in the study areas. These findings are consistent with Fatsabit & Yusran (2019), who found that average years of schooling, as an indicator of education, does not strongly affect income inequality. In addition, Mayer (2010) noted that while more education is correlated with higher earnings, inequality in schooling does not account for a significant portion of the variance in adult income. In other words, even if schooling becomes more equal, income disparities remain largely unchanged. One contributing factor is the tendency of highly educated individuals to migrate abroad in search of better employment opportunities. As a result, their contribution to reducing domestic inequality becomes minimal or insignificant. Therefore, although education is recognized as an important instrument for economic development, its role in reducing inequality remains suboptimal if it is not accompanied by equitable quality and alignment with labor market demands.

6. Conclusions

6.1 Conclusion

Several key findings emerge from the results of the multiple linear regression analysis, which examines the effects of education level and population on income inequality in the urban areas of Aceh Province from 2010 to 2022. First, the total population has a positive and significant effect on income inequality. It means that an increase in population tends to accompany a rise in inequality. It occurs because a larger population intensifies competition for limited economic resources, such as employment opportunities and income. Those with better skills, capital, and access can benefit more, while less advantaged groups fall further behind. Consequently, this widens the income gap in urban communities. Second, education level exhibits a positive but statistically insignificant effect on income inequality. Although theoretically, higher education is expected to increase income and improve economic distribution, the increase in average years of schooling in Aceh has not effectively reduced inequality. One contributing factor is the mismatch between graduates' skills and labor market demands, leaving some highly educated individuals struggling to secure suitable employment. Therefore, education alone cannot reduce inequality without adequate and inclusive employment opportunities.

6.2 Policy Implications and Recommendations for Future Research

Based on the conclusions above, several policy recommendations can be proposed: (i) Managing Population Growth: To mitigate the effect of total population on income inequality, the government should strengthen sustainable population planning policies. Family management should be intensified on public campaigns, family planning programs, and education to control population growth. Simultaneously, investing in basic infrastructure and promoting economic development in underdeveloped areas is crucial to ensure a more equitable distribution of economic opportunities across regions. (ii) Improving Education Access and Quality: To reduce inequality related to education, improving access to and quality of education for all societal groups should be prioritized. The government can expand scholarship

programs for underprivileged families, enhance teacher quality through continuous training, and improve educational infrastructure in remote areas. Additionally, curricula should be better aligned with labor market needs, ensuring graduates acquire relevant and competitive skills. In this way, education can be a tool for social mobility and a mechanism to reduce income disparities. (iii) Future Research Directions: Subsequent studies can analyze other factors influencing inequality, such as economic growth, industrial structure, fiscal policies, and urbanization levels. A more comprehensive examination will provide a fuller understanding of the causes and solutions to income inequality in Aceh, thereby enriching policy recommendations for equitable regional development.

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