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Research Article

Poverty in Aceh Province: The Role of Human Development, Unemployment, and Economic Growth

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Abstract

This study examines the effects of the Human Development Index (HDI), Open Unemployment Rate (OUR), and Gross Regional Domestic Product (GRDP) per capita on poverty in Aceh Province. Despite receiving substantial fiscal support through the Special Autonomy Fund, Aceh continues to record one of the highest poverty rates in Indonesia, indicating persistent structural challenges. This study provides district-level evidence from 23 regencies and municipalities in Aceh during 2020–2024 using panel data regression analysis. Based on the Chow, Hausman, and Lagrange Multiplier tests, the Random Effect Model was identified as the most appropriate specification. The findings reveal that HDI has a significant negative effect on poverty, indicating that improvements in education, health, and living standards contribute to poverty reduction. The Open Unemployment Rate also exhibits a significant negative relationship with poverty, suggesting the importance of regional labor market characteristics and informal employment. Meanwhile, GRDP per capita has no significant effect, implying that economic growth has not been sufficiently inclusive to alleviate poverty. These findings emphasize that strengthening human capital and improving labor market quality are more effective strategies for reducing poverty in Aceh Province.

Keywords: Poverty, Human Development Index, Unemployment, Economic Growth, Panel Data

JEL Classification: I32, J64, O15, O47

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1. Introduction

Poverty remains a multidimensional issue and continues to be one of the major challenges in Indonesia's development process. According to the World Bank (2024), although global poverty rates have shown a declining trend over the last two decades, the COVID-19 pandemic triggered a substantial increase in the number of newly poor populations, particularly in developing countries. Poverty affects not only economic conditions but also educational attainment, health quality, and access to other economic resources. Within the framework of inclusive and sustainable development, poverty alleviation is widely regarded as one of the primary indicators of successful development policies.

Aceh Province is one of the regions in Indonesia with distinctive historical, social, and fiscal characteristics, particularly through the allocation of Special Autonomy Funds. Based on data from Badan Pusat Statistik (BPS, 2025), the poverty rate in Aceh consistently remained higher than the national average during the 2020–2024 period. As illustrated in Figure 1, the poverty rate in Aceh reached approximately 15% in 2020, whereas the national average was around 10%. By 2024, Aceh still recorded a poverty rate of approximately 14.2%, compared to the national figure of 9%. Although both indicators demonstrated a downward trend, the persistent disparity suggests that Aceh faces more complex structural challenges related to human capital quality, economic structure, and the effectiveness of poverty reduction programs.

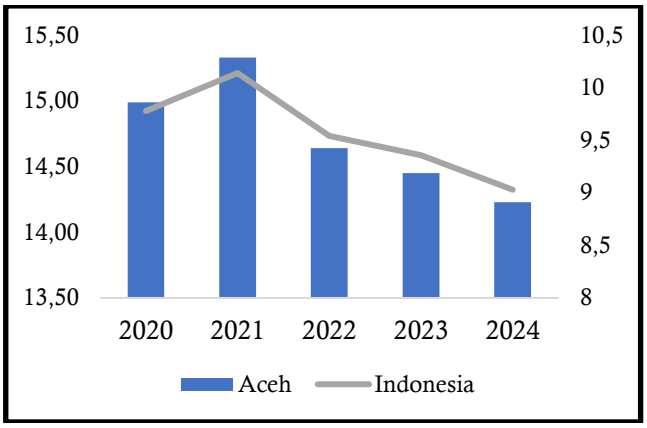

Figure 1. Dynamics of Poverty Rates in Aceh Province and Indonesia, 2020–2024

Differences in poverty levels across Aceh are closely associated with the quality of human development, as reflected in the Human Development Index (HDI). BPS (2024) reported that HDI scores in Aceh varied considerably across regencies and municipalities in 2024, with Banda Aceh City recording the highest HDI score of 82.16, while Subulussalam City recorded the lowest score of 68.04. This disparity indicates unequal human development, which potentially affects the ability of communities in underdeveloped areas to escape poverty. According to Todaro and Smith (2009) emphasized that disparities in human development may become a significant obstacle to equitable poverty reduction.

In addition to human development, labor market conditions and economic performance also play important roles in influencing poverty. According to BPS (2024), Aceh's Open Unemployment Rate (OUR) fluctuated considerably during the 2020–2024 period. Unemployment increased significantly during the COVID-19 pandemic before gradually declining during the economic recovery phase. Meanwhile, Aceh's GRDP growth showed a positive trend after the pandemic; however, the benefits of growth were not distributed evenly across regencies and municipalities. As a result, economic growth may not automatically translate into poverty reduction, particularly when development outcomes are concentrated in certain regions or sectors.

From a theoretical perspective, Human Capital Theory (Becker, 1964) argues that improvements in education and health increase productivity and income opportunities, thereby reducing poverty. Similarly, Solow's Growth Theory (1956) emphasizes the role of capital accumulation and productivity in improving welfare. However, Kuznets (1955) suggested that economic growth may initially increase inequality before generating widespread welfare improvements. These theoretical perspectives imply that poverty is influenced not only by economic growth but also by the quality of human development and labor market performance.

Previous studies have reported mixed findings regarding the determinants of poverty. Samiani et al. (2024), using a Dynamic Panel Data GMM approach, found that unemployment had a positive and significant effect on poverty, while the impact of HDI was relatively weak in the short run.

Desmawan et al. (2021), employing a Fixed Effect Model (FEM), identified unemployment as a major factor increasing poverty, whereas HDI significantly reduced poverty levels. Meanwhile, Wau (2022) found that human capital played a significant role in poverty reduction in underdeveloped regions of Indonesia, while economic growth alone was insufficient to alleviate poverty effectively. Similarly, Arwani et al. (2023) reported that economic growth had no significant effect on poverty, suggesting that growth outcomes may depend on regional characteristics and development inclusiveness.

Although numerous studies have examined the relationship between human development, unemployment, economic growth, and poverty, empirical findings remain inconsistent. More importantly, evidence focusing specifically on Aceh Province remains relatively limited, particularly at the regency and municipality levels during the post-COVID-19 recovery period. Most previous studies either examined broader national contexts or focused on specific determinants of poverty without explicitly analyzing how HDI, unemployment, and economic growth simultaneously influence poverty during the transition from pandemic-related economic disruption to recovery.

The period 2020–2024 is particularly important because it captures major socioeconomic changes associated with the COVID-19 crisis and subsequent recovery process. During this period, Aceh experienced significant adjustments in labor market conditions, economic activity, and human development outcomes. Consequently, re-examining poverty determinants during this recovery phase is necessary to understand whether conventional poverty drivers continue to operate in the same manner under post-pandemic conditions.

Therefore, this study contributes to the literature by providing updated evidence on poverty determinants in Aceh Province using panel data from 23 regencies and municipalities during the 2020–2024 period. Unlike previous studies, this research specifically focuses on the post-COVID-19 recovery period and simultaneously examines the roles of HDI, unemployment, and GRDP per capita in explaining poverty dynamics. Accordingly, the study aims to analyze the effects of the Human Development Index, Open Unemployment Rate, and GRDP per capita on poverty levels in Aceh Province using panel data regression analysis.

2. Literature Review and Hypothesis

Concepts and Integrated Theoretical Framework

Poverty is a multidimensional phenomenon characterized by the inability of individuals or households to fulfill basic needs, including food, education, health services, housing, and access to economic opportunities (World Bank, 2024). Consequently, poverty cannot be explained solely by income deprivation but must also be understood through broader socioeconomic dimensions. In the context of regional development, poverty is influenced by the interaction between human development, labor market performance, and economic growth.

The Human Development Index (HDI) is a composite indicator measuring achievements in three fundamental dimensions of human welfare, namely health, education, and standard of living (BPS, 2024). According to Human Capital Theory proposed by Becker (1964), investments in education and health increase individual productivity, skills, and earning capacity. Better human capital enables individuals to access productive employment opportunities and generate higher incomes, thereby reducing their vulnerability to poverty. Therefore, HDI serves as an important indicator of a region's capacity to improve welfare and alleviate poverty.

The relationship between human development and poverty is closely associated with labor market conditions. Individuals with higher levels of education and skills are generally more competitive in the labor market and less likely to experience prolonged unemployment. Conversely, limited human capital may restrict access to productive employment and increase the risk of poverty. From a Keynesian perspective, unemployment reduces aggregate demand, household income, and consumption, which subsequently worsens poverty conditions (Mankiw, 2015). Consequently,

unemployment functions as an important transmission mechanism through which human development influences household welfare.

At the macroeconomic level, Economic Growth Theory developed by Solow (1956) emphasizes that economic growth, driven by capital accumulation and productivity improvements, contributes to higher income levels and welfare. Economic growth expands production capacity, stimulates investment, and creates employment opportunities that may improve living standards. However, Kuznets (1955), through the inverted-U hypothesis, argued that economic growth may initially increase inequality before eventually generating broader welfare improvements. This suggests that economic growth does not automatically reduce poverty unless its benefits are distributed inclusively across society.

Based on these theoretical perspectives, poverty is viewed as the outcome of interactions among human development, labor market performance, and economic growth. Improvements in human development increase productivity and employment opportunities, while inclusive economic growth generates broader income-earning opportunities. Therefore, regions characterized by higher human development, lower unemployment, and more inclusive economic growth are expected to experience lower poverty rates. This integrated framework serves as the theoretical foundation for analyzing poverty determinants in Aceh Province.

The Effect of Human Development Index on Poverty
An increase in HDI reflects improvements in the quality of human development. Individuals with better education, adequate health conditions, and decent incomes possess greater opportunities to improve their welfare and escape poverty (Todaro & Smith, 2009). Human Capital Theory suggests that investments in education and health enhance labor productivity and income-generating capacity, which ultimately contribute to poverty reduction (Becker, 1964).

Empirical evidence supports this argument. Desmawan et al. (2021) found that HDI significantly reduced poverty in Banten Province. Similarly, Wau (2022) reported that human capital was the dominant factor accelerating poverty reduction in underdeveloped regions of Indonesia. Hakim et al. (2025) further demonstrated that villages with lower HDI levels tended to experience higher poverty rates due to limited access to economic opportunities and public services.
Based on the theoretical and empirical evidence, the following hypothesis is proposed:
H1: The Human Development Index has a negative and significant effect on poverty in Aceh Province.

The Effect of Open Unemployment Rate on Poverty
Unemployment is widely recognized as one of the major causes of poverty because it reduces household income and limits access to economic resources. Keynesian theory argues that unemployment weakens aggregate demand and household consumption, thereby increasing poverty levels (Mankiw, 2015). When individuals are unable to secure employment, their capacity to meet basic needs declines, increasing their vulnerability to poverty.

Several empirical studies support this relationship. Samiani et al. (2024) found that unemployment exerted a positive and significant effect on poverty in Indonesia. Desmawan et al. (2021) also identified unemployment as a major contributor to poverty in Banten Province. Furthermore, Mohamed (2024) argued that labor market rigidities can weaken the poverty-reducing effect of economic growth when employment creation remains limited.
Therefore, the following hypothesis is proposed:
H2: The Open Unemployment Rate has a positive and significant effect on poverty in Aceh Province.

The Effect of Economic Growth on Poverty
Economic growth is generally considered an important mechanism for improving welfare and reducing poverty. According to Solow (1956), economic growth increases production capacity,

stimulates investment, and creates employment opportunities. As economic activity expands, household incomes are expected to increase, thereby reducing poverty levels.

Nevertheless, the relationship between economic growth and poverty is not always straightforward. Kuznets (1955) argued that economic growth may initially generate unequal benefits across society, resulting in limited poverty reduction. Consequently, the effectiveness of economic growth in reducing poverty depends on the inclusiveness of growth and the distribution of its benefits among different population groups.

Previous empirical findings remain mixed. Purwanti (2024) found that economic growth contributed significantly to poverty reduction in East Java. Conversely, Arwani et al. (2023) reported that economic growth had no significant effect on poverty in Central Java, whereas HDI and unemployment were more influential determinants. Bhaskara et al. (2023) similarly found that economic growth reduced poverty only when accompanied by improvements in human development and employment absorption.
Based on these arguments, the following hypothesis is formulated:
H3: Economic growth has a negative and significant effect on poverty in Aceh Province.

Research Framework
Based on the theoretical framework and previous empirical findings, poverty in Aceh Province is assumed to be influenced by human development, unemployment, and economic growth. Human development is expected to reduce poverty through improvements in productivity and welfare. Conversely, unemployment is expected to increase poverty due to reduced income and economic participation. Economic growth is expected to reduce poverty when its benefits are distributed inclusively across society. Therefore, this study examines the simultaneous effects of HDI, Open Unemployment Rate, and GRDP per capita on poverty levels in Aceh Province.

3. Data and Method
Research Method
This study employed a quantitative approach using panel data regression analysis. Panel data were selected because they combine time-series and cross-sectional data, enabling the simultaneous observation of temporal and regional dynamics. Moreover, panel data analysis is considered superior in addressing unobserved heterogeneity that cannot be adequately captured by either cross-sectional or time-series regression models independently (Baltagi, 2005).

The study utilized secondary data obtained from official publications of the Central Bureau of Statistics (BPS), including the Central Bureau of Statistics of Indonesia and the Central Bureau of Statistics of Aceh Province. Data were collected from annual statistical reports such as *Aceh in Figures*, *Poverty Profile in Indonesia*, and other socioeconomic publications issued by BPS. The dataset covers 23 regencies and municipalities in Aceh Province during the period 2020–2024, resulting in a balanced panel dataset consisting of 115 observations (23 cross-sectional units × 5 years). The selection of the 2020–2024 period was intended to capture poverty dynamics during and after the COVID-19 pandemic, a period characterized by significant economic disruption and subsequent recovery.

The use of official government statistics ensures data consistency, comparability, and reliability across regions and years. Nevertheless, several limitations should be acknowledged. First, the analysis relies on aggregated regional-level data, which may not fully reflect household-level poverty conditions. Second, several factors potentially affecting poverty, such as income inequality, social assistance effectiveness, institutional quality, and demographic characteristics, are not included in the model due to data availability constraints. Third, the relatively short observation period may limit the ability to capture long-term structural changes in poverty. Therefore, the findings should be interpreted within the scope of the available data and research design.
The operational definitions of the research variables are presented in Table 1.

Table 1. Operational Definitions of Research Variables

Variable	Definition	Indicator/Unit
Poverty (POV)	Percentage of population living below the poverty line	% of poor population
Human Development Index (HDI)	Composite index measuring education, health, and income quality	Index score (0–100)
Open Unemployment Rate (OUR)	Percentage of labor force unemployed	% of labor force
Economic Growth (GRDP)	Gross Regional Domestic Product per capita at constant prices	Rupiah per capita

Source: Processed data (2026)

Prior to model estimation, descriptive statistical analysis was conducted to examine the characteristics and distribution of the data. The descriptive statistics include the mean, maximum value, minimum value, and standard deviation of each variable.

The panel regression analysis considered three estimation approaches: The Common Effect Model (CEM) or Pooled Least Squares (PLS), the Fixed Effect Model (FEM), and the Random Effect Model (REM). The CEM assumes no individual or temporal differences among observational units, implying that all data are homogeneous and estimated using Ordinary Least Squares (OLS). In contrast, FEM accommodates specific characteristics of each unit by allowing different intercepts across units while maintaining constant slopes. Meanwhile, REM assumes that individual differences are random effects uncorrelated with the independent variables, making the model more efficient when these assumptions are satisfied and typically estimated using the Generalized Least Squares (GLS) method.

To determine the most appropriate estimation model, several statistical tests were conducted. First, the Chow test was employed to select between the CEM and FEM models. A probability value below 0.05 indicates rejection of the null hypothesis, suggesting that FEM is more appropriate. Second, the Hausman test was conducted to determine whether FEM or REM was more suitable. If the probability value is below 0.05, the null hypothesis supporting REM is rejected, indicating that FEM is preferable. Conversely, an insignificant result implies that REM is more efficient. Finally, the Lagrange Multiplier (LM) test was performed to determine whether REM is more appropriate than CEM. Consequently, the selection of the panel regression model in this study was based on statistical testing to ensure compatibility with the data characteristics.

The panel regression model used in this study is formulated as follows:

$$\boldsymbol{POV\_it = \alpha + \beta_1 HDI\_it + \beta_2 OUR\_it + \beta_3 GRDP\_it + \mu\_it} \quad (1)$$

Where:
POV_it = Poverty level in regency/municipality i during year t
HDI_it = Human Development Index
OUR_it = Open Unemployment Rate
$GRDP\_it$ = Gross Regional Domestic Product per capita
μ_it = Error term
α = Constant
$\beta_1, \beta_2, \beta_3$ = Regression coefficients

4. Results

Descriptive Statistics

Descriptive statistics provide an overview of the distribution and characteristics of the research variables. Table 2 presents the mean, standard deviation, minimum value, and maximum value of poverty, Human Development Index (HDI), Open Unemployment Rate (OUR), and Gross Regional Domestic Product (GRDP) per capita across 23 regencies/municipalities in Aceh Province during 2020–2024.

Table 2. Descriptive Statistics of Research Variables (2020–2024)

Variable	Mean	Std. Deviation	Min	Max
Poverty (%)	15.0887	3.301	6.90	20.36
HDI	72.2033	4.533	64.93	87.17
Unemployment (%)	5.7567	2.140	1.24	11.99
GRDP (%)	3.0004	1.991	-3.39	7.50

Source: Processed data (2026)

The results indicate considerable variation among regencies and municipalities in Aceh Province. Poverty rates ranged from 6.90% to 20.36%, while HDI scores varied from 64.93 to 87.17. The unemployment rate ranged between 1.24% and 11.99%, reflecting differences in labor market conditions across regions. Meanwhile, GRDP growth varied substantially, from -3.39% to 7.50%, indicating heterogeneous economic performance during the study period. These variations justify the use of panel data analysis, which is capable of capturing both cross-sectional and temporal dynamics.

Model Selection Test Results

To determine the most appropriate panel data model, the Chow Test, Hausman Test, and Lagrange Multiplier (LM) Test were conducted. The results are presented in Table 3.

Table 3. Results of Model Selection Tests

Test	Probability	Model Comparison	Selected Model
Chow Test	0.000	CE vs FE	FE
Hausman Test	0.439	FE vs RE	RE
LM Test	0.000	CE vs RE	RE

Source: Processed data (2026)

The Chow Test indicates that the Fixed Effect Model is preferred to the Common Effect Model. However, the Hausman Test suggests that the Random Effect Model is more appropriate than the Fixed Effect Model. Furthermore, the LM Test confirms that the Random Effect Model is superior to the Common Effect Model. Therefore, the Random Effect Model (REM) was selected as the final estimation model.

Panel Regression Results

The Random Effect Model estimation results are presented in Table 4.

Table 4. Random Effect Model Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.	95% Confidence Interval
C	50.93077	8.076983	6.305667	0.0000	[35.10; 66.76]
HDI	-0.494110	0.093424	-5.288892	0.0000	[-0.6772; -0.3110]
OUR	-0.050237	0.007361	-6.825031	0.0000	[-0.0647; -0.0358]
GRDP	0.041164	0.031714	1.297969	0.1970	[-0.0210; 0.1033]

Source: Processed data (2026)

Based on the estimation results, the regression equation can be expressed as:

$$\boldsymbol{POV = 50.93077 - 0.494110HDI - 0.050237OUR + 0.041164GRDP + \mu} \quad (2)$$

The results show that HDI has a negative and statistically significant effect on poverty. A one-point increase in HDI is associated with a reduction of approximately 0.49 percentage points in poverty, holding other variables constant. The confidence interval does not include zero, confirming the robustness of the estimated effect.

The Open Unemployment Rate also exhibits a negative and statistically significant relationship with poverty. The estimated coefficient indicates that a one-percentage-point increase in unemployment is associated with a reduction of approximately 0.05 percentage points in poverty. Although statistically significant, the magnitude of this effect is relatively small compared with that of HDI.

Meanwhile, GRDP per capita displays a positive but statistically insignificant coefficient. The confidence interval includes zero, indicating that economic growth does not exert a statistically significant effect on poverty during the observation period.

Goodness-of-Fit Results
The goodness-of-fit statistics are presented in Table 5.

Table 5. Goodness-of-Fit Statistics

Statistic	Value
R-squared	0.726519
Adjusted R-squared	0.719128
Prob(F-statistic)	0.000000

Source: Processed data (2026)

The R-squared value of 0.7265 indicates that approximately 72.65% of the variation in poverty levels across regencies and municipalities in Aceh Province can be explained by HDI, unemployment, and GRDP per capita. The Adjusted R-squared value remains close to the R-squared value, suggesting that the model provides a stable fit. Furthermore, the Prob(F-statistic) value of 0.0000 confirms that the explanatory variables jointly exert a statistically significant effect on poverty.

Overall, the results indicate that human development and unemployment are significant determinants of poverty in Aceh Province, whereas economic growth does not exhibit a statistically significant effect during the 2020–2024 period.

5. Discussion

The findings of this study suggest that poverty dynamics in Aceh Province cannot be understood solely through the lens of economic growth. Instead, poverty appears to be more strongly influenced by human development and the specific characteristics of the regional labor market. The results reveal that HDI has a significant negative effect on poverty, unemployment exhibits a negative and significant relationship with poverty, while GRDP per capita has no statistically significant effect. Taken together, these findings indicate that improvements in human capabilities may be more important for poverty reduction than increases in aggregate economic output.

The strong role of HDI supports Human Capital Theory (Becker, 1964), which argues that investments in education and health enhance productivity, employability, and income-generating capacity. Beyond statistical significance, the economic magnitude of the HDI coefficient is substantial. A one-point increase in HDI is associated with a reduction of approximately 0.49

percentage points in poverty. Considering that the average poverty rate in Aceh during the study period was approximately 15%, this effect represents a meaningful improvement in welfare. The finding is consistent with Desmawan et al. (2021), Wau (2022), and Hakim et al. (2025), who similarly found that improvements in human development contribute significantly to poverty reduction. In the context of Aceh, where substantial disparities in education and health services remain across regencies and municipalities, strengthening human development appears to be one of the most effective long-term strategies for reducing poverty.

The negative relationship between unemployment and poverty represents the most unexpected finding of this study and requires careful interpretation. Conventional economic theory predicts that unemployment increases poverty by reducing income and consumption opportunities (Mankiw, 2015). Similarly, Samiani et al. (2024) and Desmawan et al. (2021) reported a positive relationship between unemployment and poverty. However, the present findings suggest that the relationship may operate differently in Aceh due to specific labor market conditions and socioeconomic characteristics.

One possible explanation is the prevalence of frictional unemployment among educated job seekers. Individuals who are temporarily unemployed while searching for employment may not necessarily belong to poor households. Many recent graduates continue to receive financial support from their families during the job-search process, allowing them to remain above the poverty line despite being classified as unemployed. This interpretation is particularly relevant in Aceh, where family networks and social support systems remain strong. Consequently, unemployment statistics may partly reflect labor market transition processes rather than severe economic deprivation.

Another explanation relates to the dominance of the informal sector in Aceh's economy. Many individuals classified as unemployed may still participate in informal economic activities that generate income but are not fully captured by official labor market statistics. Therefore, unemployment does not necessarily imply a complete absence of income. Similar observations have been reported in studies of developing regions, where informal employment often functions as a buffer against poverty during periods of labor market adjustment.

The post-COVID-19 context may also contribute to this result. During the pandemic and recovery period, various government social protection programs, including cash transfers, food assistance, and other welfare interventions, were implemented to support vulnerable households. Such programs may have weakened the direct relationship between unemployment and poverty by providing temporary income support. Consequently, households experiencing unemployment may not have immediately fallen below the poverty line. This interpretation highlights the importance of considering institutional and policy factors when analyzing poverty determinants.

The insignificant effect of GRDP per capita further reinforces the argument that economic growth alone is insufficient to reduce poverty. Although economic growth is theoretically expected to improve welfare through higher income and employment opportunities (Solow, 1956), the results suggest that growth in Aceh has not been sufficiently inclusive. The estimated coefficient indicates that increases in GRDP per capita are associated with only a small change in poverty and that the relationship is statistically insignificant. This finding is consistent with Arwani et al. (2023) and partially supports Kuznets' (1955) argument that economic growth does not automatically benefit all population groups equally.

Several contextual factors may explain this result. First, economic activity in Aceh remains unevenly distributed across regions. Urban areas such as Banda Aceh, Langsa, and Lhokseumawe tend to experience stronger economic performance than more remote regions such as Gayo Lues, Aceh Singkil, and Subulussalam. Second, economic growth may be concentrated in sectors with limited labor absorption, reducing its capacity to improve the welfare of poor households. Third, despite substantial fiscal transfers through the Special Autonomy Fund, poverty levels in Aceh remain among the highest in Indonesia, suggesting that economic resources have not been translated fully into inclusive development outcomes.

Taken together, the findings reveal an important pattern. Poverty reduction in Aceh appears to depend less on the pace of economic growth and more on the quality of human development and the effectiveness of labor market inclusion. The results imply that policies focusing exclusively on increasing regional output may have limited impacts on poverty unless accompanied by improvements in education, health, employment quality, and equitable access to economic opportunities. Therefore, a more integrated development strategy that combines human capital development, labor market strengthening, and inclusive growth policies is essential for achieving sustainable poverty reduction in Aceh Province.

6. Conclusion

This study examined the effects of the Human Development Index (HDI), Open Unemployment Rate (OUR), and Gross Regional Domestic Product (GRDP) per capita on poverty across 23 regencies and municipalities in Aceh Province during the 2020–2024 period using panel data regression analysis. The findings reveal that HDI has a significant negative effect on poverty, confirming that improvements in education, health, and living standards remain essential for poverty reduction. Unexpectedly, the Open Unemployment Rate also exhibits a significant negative relationship with poverty, indicating that labor market conditions in Aceh may differ from conventional theoretical expectations and warrant further investigation. Meanwhile, GRDP per capita has no significant effect on poverty, suggesting that economic growth alone has not been sufficiently inclusive to improve the welfare of poor households. Overall, the findings demonstrate that strengthening human capital plays a more substantial role in poverty alleviation than relying solely on economic growth. This study contributes to the literature by providing updated district-level empirical evidence on poverty determinants in Aceh and highlighting the importance of integrating human development with labor market and regional development policies to achieve sustainable poverty reduction.

The findings offer several practical implications for policymakers and regional development stakeholders in Aceh Province. First, poverty alleviation policies should prioritize investments in education, healthcare, and human capital development, particularly in regencies and municipalities with relatively low HDI levels. Second, labor market policies should focus not only on reducing unemployment but also on improving employment quality through vocational training, skills development, and stronger job matching mechanisms to better address the characteristics of unemployment in Aceh. Third, regional economic policies should promote more inclusive growth by strengthening labor-intensive industries, supporting micro, small, and medium enterprises (MSMEs), and improving the governance and effectiveness of the Special Autonomy Fund to ensure that the benefits of economic development are distributed more equitably. An integrated policy approach combining human development, labor market improvement, and inclusive economic growth is expected to generate more sustainable and equitable poverty reduction across Aceh Province.

Limitations and avenue for future research

This study has several limitations. First, it focuses only on the effects of HDI, unemployment, and GRDP per capita on poverty in Aceh Province during 2020–2024, thereby excluding other relevant determinants such as income inequality, government expenditure, and social assistance programs. Second, the analysis relies on secondary data at the regency/municipality level, which may not fully capture household-level poverty dynamics. Future research is encouraged to incorporate additional variables, longer observation periods, and spatial or dynamic panel approaches to provide a more comprehensive understanding of poverty determinants.

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