

Determinants of Human Development Index in West Kalimantan: An Empirical Analysis of Regencies and Cities

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ABSTRACT

The Human Development Index (HDI) achievement in West Kalimantan Province in 2025 remained the lowest on Kalimantan Island. This condition indicates structural barriers in transforming economic wealth into proportional human capital quality. Meanwhile, studies on the determinants of HDI in West Kalimantan remain relatively limited, particularly those exploring the roles of economic factors, education, and public spending on education and health as policy instruments for fostering human development. This study aims to analyze the determinants of HDI across the regencies and cities of West Kalimantan Province, focusing on economic, fiscal, and educational variables. The study utilizes panel data covering 14 regencies and cities in West Kalimantan over the 2020–2024 period. The research methodology employs both descriptive and inferential analysis, specifically panel data regression. The results indicate that human development in West Kalimantan is more strongly influenced by educational attainment, reflected in the Mean Years of Schooling and economic growth, represented by Gross Regional Domestic Product (GRDP) per capita. Conversely, public spending, specifically on education and health, has not yet demonstrated optimal effectiveness in boosting HDI, necessitating further evaluation regarding its efficiency and allocation. This study contributes to addressing the scarcity of empirical research on HDI determinants in West Kalimantan by simultaneously examining the roles of economic factors, education, and public spending on education and health at the regency/city level using panel data. The findings imply that local governments must go beyond merely increasing budget allocations for education and health; they need to enhance spending effectiveness and targeting by improving service quality, infrastructure, and the quality of educators and medical personnel to foster more inclusive and sustainable human development.

Keywords : Human Development Index, Regional Health Expenditure, Regional Education Expenditure, West Kalimantan

ABSTRAK

Indeks Pembangunan Manusia (IPM) di Provinsi Kalimantan Barat pada tahun 2025 tetap yang terendah di Pulau Kalimantan. Kondisi ini mengindikasikan adanya hambatan struktural dalam mentransformasikan kekayaan ekonomi menjadi kualitas modal manusia yang proporsional. Sementara itu, studi tentang determinan IPM di Kalimantan Barat masih relatif terbatas, khususnya yang mengeksplorasi peran faktor ekonomi, pendidikan, dan pengeluaran publik untuk pendidikan dan kesehatan sebagai instrumen kebijakan untuk memupuk pembangunan manusia. Penelitian ini bertujuan untuk menganalisis determinan IPM di seluruh kabupaten dan kota di Provinsi Kalimantan Barat, berfokus pada variabel ekonomi, fiskal, dan pendidikan. Penelitian ini menggunakan data panel yang mencakup 14 kabupaten dan kota di Kalimantan Barat selama periode 2020–2024. Metodologi penelitian menggunakan analisis deskriptif dan inferensial, secara spesifik regresi data panel. Hasil penelitian menunjukkan bahwa pembangunan manusia di Kalimantan Barat lebih kuat dipengaruhi oleh pencapaian pendidikan, yang tercermin dalam Rata-Rata Lama Sekolah dan pertumbuhan ekonomi, yang diwakili oleh Produk Domestik Regional Bruto (PDRB) per kapita. Sebaliknya, pengeluaran publik, khususnya untuk pendidikan dan kesehatan, belum menunjukkan efektivitas yang optimal dalam meningkatkan IPM, sehingga memerlukan evaluasi lebih lanjut mengenai efisiensi dan alokasinya. Penelitian ini berkontribusi untuk mengatasi kelangkaan penelitian empiris tentang determinan IPM di Kalimantan Barat dengan secara simultan memeriksa peran faktor ekonomi, pendidikan, dan pengeluaran publik untuk pendidikan dan kesehatan di tingkat kabupaten/kota menggunakan data panel. Temuan ini mengimplikasikan bahwa pemerintah daerah harus melampaui sekadar meningkatkan alokasi anggaran untuk pendidikan dan kesehatan, mereka perlu meningkatkan efektivitas belanja dan ketepatan sasaran dengan meningkatkan

	kualitas layanan, infrastruktur, dan kualitas tenaga pendidik serta personel medis untuk memupuk pembangunan manusia yang lebih inklusif dan berkelanjutan
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INTRODUCTION

Sustainable development is not only oriented towards accelerating economic growth but also towards improving human capabilities and people's living standards. Nurlina et al. (2023) note that human development in a modern economy contributes significantly to accelerating economic growth. Therefore, the success of a region's development cannot be solely assessed based on increased economic output, it also needs to consider the extent to which this growth improves the quality of life of the community. The Human Development Index (HDI) is one indicator commonly used to assess human development achievements in a region (Sinaga et al., 2025). The HDI places humans as the primary goal of development and demonstrates that the development of a country or region is not solely related to economic growth but also to improving human capacity and quality. The limitations of Gross Domestic Product (GDP) in comprehensively describing human development have been widely documented because GDP tends not to fully capture the social and environmental aspects of the development process (Resce, 2021). The HDI measures three main dimensions of human development, a long and healthy life, knowledge, and a decent standard of living. Arafat and Rindayati (2018) identified indicators representing these three dimensions, including life expectancy at birth, average years of schooling, expected years of schooling, and per capita income. A long and healthy life, access to education, and the ability to meet basic needs are fundamental aspects of human development. The UNDP (1990) emphasized that if these basic needs are not met, people's opportunities to access other life choices are also limited. Therefore, increasing the Human Development Index (HDI) is a crucial indicator in evaluating the success of a region's development because it reflects the quality of human resources and community well-being.

Although human development is a primary development goal, the HDI achievement between regions in Indonesia still shows disparities. Data from the Central Statistics Agency (BPS) in 2024 shows significant differences in HDI achievement between provinces. Some regions have achieved high HDI levels, such as Jakarta with a score of 83.08, while others remain in the lower category, such as Highlands Papua with a score of 53.42. This disparity is also evident on the island of Kalimantan.

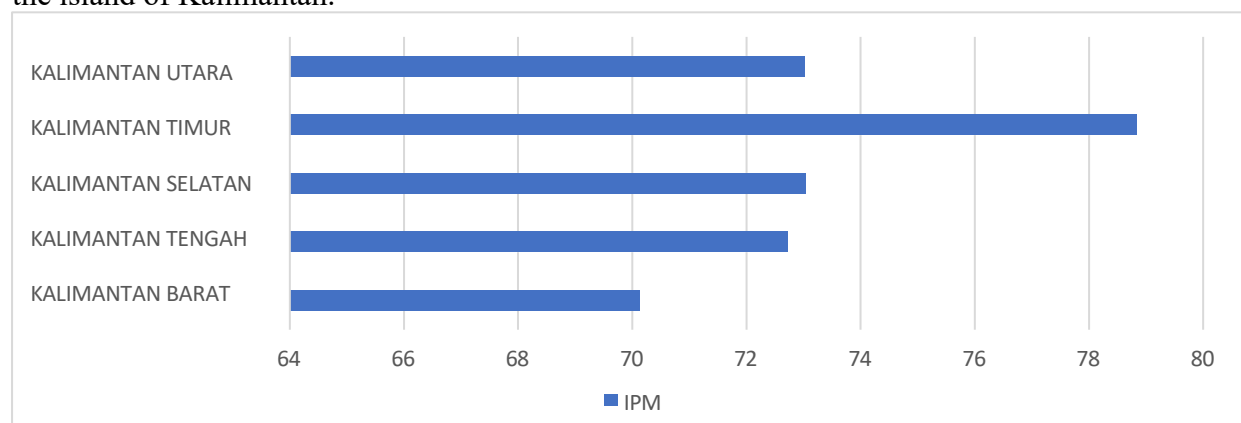


Figure 1. HDI 2024, Source: Bureau of Statistics, processed (2025)

Based on the latest 2025 data from the Central Statistics Agency (BPS), West Kalimantan Province has the lowest HDI achievement compared to other provinces on the island of

Kalimantan. This condition indicates that economic growth and regional resources have not been fully converted into proportional improvements in the quality of human development. This situation is important to examine because differences in HDI achievement not only reflect variations in the socio-economic conditions of the community but also indicate differences in the capacity of local governments to allocate resources to support human development. Therefore, identifying the factors influencing the HDI in West Kalimantan is necessary to understand the determinants of human development and provide an empirical basis for formulating regional development policies.

Several previous studies have examined the factors influencing the HDI in various regions. Nurlina et al. (2023) examined the determinants of the HDI in Indonesia, while Ramadanisa and Triwahyuningtyas (2022) examined the factors influencing the HDI in East Kalimantan. Sinaga et al. (2025) examined the determinants of the HDI in West Java, while Nizhamul et al. (2023) compared human development in Singapore and Hong Kong. The results showed that the determinants of human development can differ across regions. Fradani et al. (2025), for example, found that poverty levels negatively impacted the HDI, while population size, average years of schooling, and life expectancy had a significant positive impact. These findings differ from those of Sapaat et al. (2020), who found that poverty levels did not significantly impact the HDI. Meanwhile, the open unemployment rate, economic growth, and road infrastructure also did not always show a significant influence on the HDI. In addition to economic factors, Fradani et al. (2025) through spatial mapping showed inequality in human development in Riau Province, with HDI achievements tending to be higher in urban areas than in coastal areas. These differences in findings indicate that the determinants of human development are contextual and can be influenced by social, economic, and geographic characteristics, as well as development policies implemented at each region.

In addition to socio-economic factors, public policy and the fiscal capacity of local governments can also play a role in improving human development. Arafat and Rindayati (2018) found that government spending in the health sector and regional characteristics, including urban and district status, contributed to the increase in the Human Development Index (HDI) in Central Kalimantan. Luther et al. (2019) also found that direct government spending had a positive and significant influence on the HDI in West Sulawesi Province. These findings indicate that human development is not solely determined by the economic conditions of the community but can also be influenced by the government's ability to allocate public resources to sectors directly related to improving the quality of life. In this context, education and health spending are important fiscal policy instruments to study because budget allocations to these two sectors can theoretically expand access and improve the quality of basic services that are the foundation of human development. However, large budget allocations do not necessarily automatically result in better human development outcomes if they are not accompanied by effective and targeted use.

In the context of West Kalimantan, research on the determinants of the Human Development Index (HDI) has been conducted, including by Fitriani (2022), who analyzed the influence of the number of poor people and government spending in the education and health sectors on the HDI of districts/cities in West Kalimantan Province. Using panel data for the 2015–2019 period, the study found that government spending in the education and health sectors had a positive and significant effect on the HDI. These findings provide empirical evidence that regional fiscal policy is linked to human development in West Kalimantan. Research by Satyahadewi et al. (2023) also used average years of schooling as an indicator related to human development. However, these studies still leave room for further research, particularly in examining how economic factors, educational attainment, and fiscal policy through education and health spending simultaneously relate to the HDI in more recent periods.

Based on previous research, several research gaps warrant attention. First, previous research on the determinants of the HDI indicates inconsistent influences between variables and

regions, necessitating tests that consider specific regional characteristics. Second, although Fitriani (2022) examined government spending on education and health in West Kalimantan, the study used the 2015–2019 period and therefore failed to capture the dynamics of human development and fiscal policy in 2020–2024. This period is particularly relevant because it encompasses the COVID-19 pandemic and the economic recovery period, which can impact the socioeconomic conditions of communities, as well as the priorities and effectiveness of local government spending. Third, studies that integrate economic factors, educational attainment, and government spending on education and health within a single analytical framework at the district/city level in West Kalimantan still need to be strengthened to gain a more comprehensive understanding of the determinants of the HDI.

This research gap is even more relevant given the situation in West Kalimantan, which still has the lowest HDI achievement on the island of Kalimantan. This situation raises empirical questions about whether improvements in human development in West Kalimantan's districts/cities are more related to the economic conditions and educational attainment of the community or to the fiscal capacity of local governments through education and health spending. Thus, more recent empirical evidence is needed to determine which factors are most strongly associated with HDI achievement and whether public spending allocation in the education and health sectors has been aligned with improving human development.

Based on this research gap, the novelty of this study is simultaneous examination of economic factors, educational attainment, and fiscal policy through education and health spending as determinants of HDI in 14 districts/cities in West Kalimantan Province during the 2020–2024 period. This study updates the empirical evidence of Fitriani (2022) by using a more recent observation period and broadens the analytical perspective by placing average years of schooling as a proxy for educational attainment and education and health spending as fiscal instruments within a single panel data regression framework. With this approach, this study not only identifies factors related to HDI variation across districts/cities but also provides a perspective on the relationship between human development outcomes and public resource allocation policies at the local level.

Local government fiscal policy can play a crucial role in improving human development indicators by allocating budgets to factors that contribute to enhancing the community's quality of life (Nurlina et al., 2023). Therefore, this study is expected to make an empirical contribution to the development economics literature by updating the understanding of Human Development Index (HDI) determinants in West Kalimantan, while also offering more specific policy implications for local governments. The research findings can serve as a basis for evaluating whether education and health spending policies have been allocated effectively and targeted appropriately, as well as for determining development intervention priorities that align with the specific characteristics of each regency and city. In particular, the findings are expected to support efforts to strengthen the quality of and access to education and health services, improve basic infrastructure, and develop human resources as part of a more inclusive and sustainable strategy to boost the HDI.

Based on this background, this study aims to analyze the factors influencing the Human Development Index (HDI) across 14 regencies and cities in West Kalimantan Province during the 2020–2024 period, with a particular focus on economic and educational factors, as well as fiscal policies related to government spending in the education and health sector.

RESEARCH METHOD

This study uses a quantitative approach utilizing secondary panel data, which comprises both cross sectional and time series dimensions. The unit of analysis covers 14 regencies/cities in West Kalimantan Province over the 2020–2024 period, resulting in 70 observations. Data were sourced from Statistics Indonesia (BPS) and relevant local government data sources. Data

processing and analysis were conducted using EViews 12 software. The analysis consists of descriptive analysis and inferential analysis via panel data regression. The use of panel data enables the analysis to account for variations across observation units as well as changes over time, thereby allowing regional heterogeneity to be considered in model estimation (Wooldridge, 2010), (Baltagi, 2021).

Descriptive analysis is used to provide an overview of the Human Development Index (HDI) trends in West Kalimantan Province during the study period and to examine variations in HDI achievements across regencies/cities. The results are presented in tables and graphs to illustrate HDI trends and their constituent dimensions. Descriptive analysis also serves to contextualize West Kalimantan's HDI performance relative to the national average prior to conducting the inferential analysis.

The dependent variable in this study is the Human Development Index (HDI). The HDI serves as the primary indicator of human development, as it measures average achievements across three basic dimensions, a long and healthy life, knowledge, and a decent standard of living (UNDP, 2025). Consequently, the HDI is considered a relevant measure of human development outcomes at the regency/city level and acts as the primary outcome variable explained by economic, educational, and fiscal policy factors in this study.

The first independent variable is Gross Regional Domestic Product (GRDP) per capita, serving as a proxy for regional economic conditions. GRDP per capita represents a region's average economic capacity and the community's economic ability to meet basic needs. The selection of this variable also aligns with the decent standard of living dimension within the human development framework. The UNDP uses Gross National Income (GNI) per capita as the indicator for the standard of living dimension in the Human Development Index (HDI) calculation, thus, the income indicator is relevant for analyzing the relationship between economic conditions and human development (UNDP, 2025).

The second independent variable is the Mean Years of Schooling as an indicator of educational attainment. Mean Years of Schooling was selected because it represents the average number of years of formal education completed by the population and directly relates to the knowledge dimension of human development. In the HDI methodology, the UNDP utilizes mean years of schooling as one of the indicators for the education dimension. Therefore, MYS is used in this study to represent the population's educational attainment at the regency/city level (UNDP, 2025).

The third independent variable is government spending in the health sector. This variable represents local government fiscal intervention regarding the provision of services and the improvement of public health quality. The selection of health spending is based on the importance of health as a key dimension of human development. Government investment in health is a crucial component of human capital development because health alongside education and skills forms the foundation for building human capital and enhancing productivity (World Bank, 2026).

The fourth independent variable is government spending in the education sector, representing local government fiscal intervention to support access to and the quality of educational services. Education is a primary dimension of human development and a vital component of human capital formation. The World Bank identifies investment in education, health, and skills as essential elements for human capital development and the expansion of economic opportunities (World Bank, 2026).

The inclusion of education and health spending also addresses a research gap. Fitriani (2022) previously examined the impact of government spending in the education and health sectors on the HDI of regencies/cities in West Kalimantan using panel data from 2015–2019. The present study updates that analysis by covering the 2020–2024 observation period and integrating education and health spending with economic factors and educational attainment into a single

analytical model. Thus, the selection of variables is based not only on their conceptual link to human development but also on the need to expand empirical evidence regarding the determinants of the Human Development Index (HDI) in West Kalimantan.

Panel data regression is employed because the research data structure encompasses 14 regencies/cities observed over a five-year period. Panel data allows researchers to combine cross-sectional and time-series information while accounting for unobserved heterogeneity among the units of analysis (Wooldridge, 2010 & Baltagi, 2021). In the context of this study, the characteristics of each regency/city may differ in ways that cannot be entirely measured directly, selecting a panel model is necessary to obtain an appropriate estimation specification. The empirical model used is:

$$IPM_{it} = \beta_0 + \beta_1 PDRB_{it} + \beta_2 APBD_{kesehatan_{it}} + \beta_3 APBD_{pendidikan_{it}} + \beta_4 RLS_{it} + \varepsilon_{it} \quad (1)$$

Where, β_0 is the intercept, β_1 – β_4 are the coefficients of the independent variables, IPM is the Human Development Index, PDRB is GRDP per capita, APBD Kesehatan is the Regional Budget for Health, APBD Pendidikan is the Regional Budget for Education, and RLS is the Mean Years of Schooling.

Three primary approaches are considered for panel data regression estimation, the Common Effect Model (CEM) or Pooled Least Squares (PLS), the Fixed Effect Model (FEM), and the Random Effect Model (REM). These three approaches rely on different assumptions regarding the existence and treatment of individual heterogeneity within the panel data (Wooldridge, 2010 & Baltagi, 2021).

The CEM/PLS assumes that there are no specific differences between regency/city units requiring modeling, consequently, all observations are estimated using a common intercept. FEM accounts for unobserved, time-invariant characteristics specific to each regency or city. In contrast, REM treats these individual differences as random components within the model. The choice between FEM and REM depends on assumptions regarding the relationship between unobserved individual effects and the explanatory variables in the model (Wooldridge, 2010).

To determine the most appropriate model, this study employs a series of model specification tests. First, the Chow test is used to compare CEM and FEM. The null hypothesis posits that CEM is more appropriate, while the alternative hypothesis posits that FEM is more appropriate. If the probability value is less than the 5% significance level, the null hypothesis is rejected, and FEM is selected.

Second, the Lagrange Multiplier test is used to compare CEM and REM. The null hypothesis states that there are no significant individual effects making CEM more suitable, whereas the alternative hypothesis states that REM is more suitable. If the probability value is less than 5%, the null hypothesis is rejected, and REM is selected.

Third, the Hausman test is used to choose between FEM and REM. The null hypothesis states that the REM estimator is consistent and more efficient, while the alternative hypothesis states that FEM is more appropriate due to the presence of correlation between individual effects and independent variables. If the probability value is less than 5%, the null hypothesis is rejected, and FEM is selected, conversely, if the probability exceeds 5%, REM is selected (Wooldridge, 2010).

Thus, model selection is based on the results of specification tests rather than the researcher's preference for a particular model. This procedure ensures that the final model accounts for the heterogeneity in characteristics among the regencies and cities present in the research data.

The appropriate panel model is determined, statistical tests are conducted to evaluate the relationship between the independent variables and the HDI (Human Development Index). Partial tests are used to assess the significance of each independent variable, while simultaneous tests are used to evaluate the collective significance of the independent variables. The coefficient of determination is used to measure the proportion of HDI variation explained by the variables in

the model. A significance level of 5% was employed. The test decision was based on the probability value (p-value), a p-value of less than 0.05 indicates the rejection of the null hypothesis at the 5% significance level. Regression coefficients were then used to interpret the direction and magnitude of the relationship between each independent variable and the Human Development Index (HDI).

RESULTS AND DISCUSSION

Table 1. West Kalimantan Human Development Index Value and Growth, 2020-2024

Year	2020	2021	2022	2023	2024
HDI	68,76	68,99	69,71	70,47	71,19
Growth	-	0,33	1,03	1,08	1,01

Source: Bureau of Statistics, processed (2025)

From 2020 to 2024, the Human Development Index (HDI) in West Kalimantan demonstrated a consistent positive growth trend. The highest HDI achievement was recorded in 2023, with a growth rate of 1.03%. Improvements in overall quality of life were reflected across all HDI dimensions and their constituent sectors. This trend indicates that human development in West Kalimantan is moving in a positive direction in the aggregate. However, the general rise in the HDI does not fully explain which factors played the most significant role in driving these results. Therefore, an analysis of HDI determinants is necessary to identify whether the improvement in human development is more closely linked to economic conditions, educational achievements, or local government fiscal interventions.

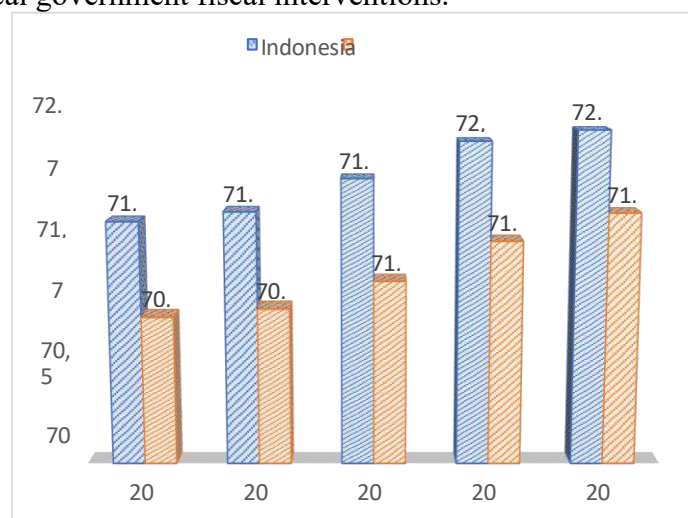


Figure 2. Life Expectancy (AHH) in West Kalimantan and Indonesia, 2020-2024

Source: Bureau of Statistics, processed (2025)

The dimension of longevity and healthy living is represented by the Life Expectancy at Birth (LEB) indicator. From 2020 to 2024, LEB trends showed continuous improvement, both nationally and in West Kalimantan. In West Kalimantan, LEB rose from 70.74 years in 2020 to 71.6 years in 2024. Nevertheless, this figure remains below the national average, indicating that the life expectancy of West Kalimantan's population is lower than the overall average for Indonesia's population.

The increase in LEB reflects an improvement in the population's capacity to live longer, healthier lives. From a human capital perspective, health is a crucial component of productive capital, as better health enables individuals to learn, work, and participate in economic activities more optimally. The World Bank (2026) identifies health, knowledge, and skills as key components of human capital that contribute to productivity and economic development. Thus, the rise in LEB in West Kalimantan can be viewed as a process of gradual human capital

accumulation. However, the fact that the figure remains below the national average indicates that health development in West Kalimantan still faces disparities that require attention.

Conversely, the knowledge dimension measured by a combination of the Expected Years of Schooling (HLS) and Mean Years of Schooling (RLS) indicators showed consistent growth from 2020 to 2024. The growth rate of RLS was slower than that of HLS. This disparity stems from the nature of RLS as a long-term output indicator, whereas HLS reflects a short-term process indicator within educational programs. Together, these two variables reflect the stock and enhancement of a region's human resources.

The difference in growth rates between RLS and HLS indicates that improvements in educational attainment are not always immediately reflected in the RLS indicator. RLS represents the accumulated education completed by the population, consequently, changes in this indicator require a relatively long time to manifest. From the perspective of Human Capital Theory, education constitutes an investment in human capital that enhances an individual's knowledge, skills, and productive capacity. Becker (1964) explains that education is an investment yielding long-term benefits through increased productivity and income. Therefore, the gradual rise in RLS can be understood as a process of human capital accumulation, the benefits of which do not necessarily appear immediately within the same period.

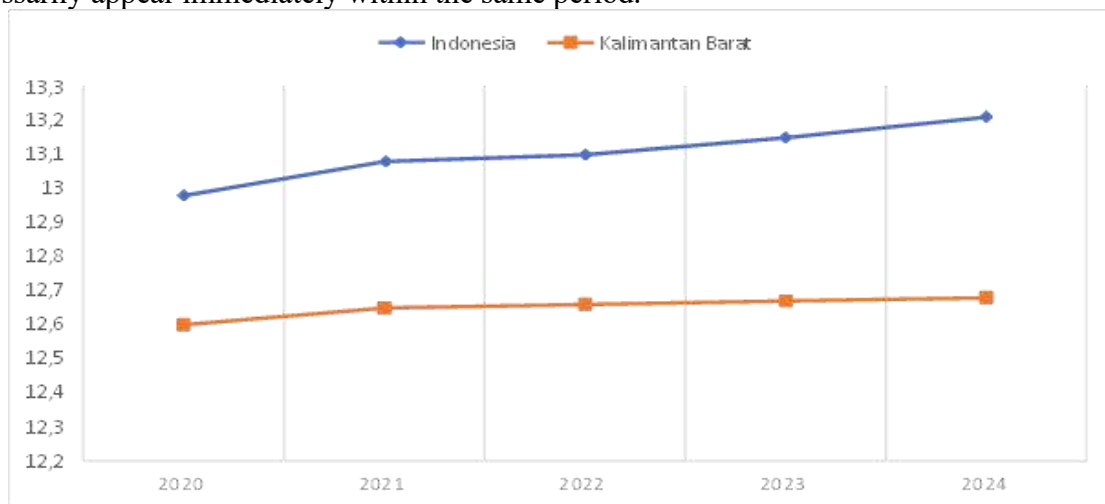


Figure 3. Expected Years of Schooling in West Kalimantan and Indonesia, 2020-2024

Source: Bureau of Statistics, processed (2025)

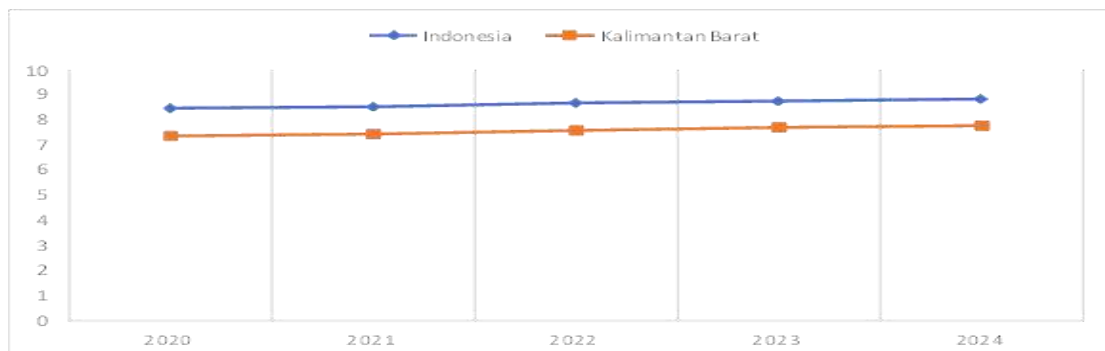


Figure 4. Mean Years of Schooling in West Kalimantan and Indonesia, 2020-2024

Source: Bureau of Statistics, processed (2025)

Standard of living is measured by per capita expenditure. Per capita expenditure in West Kalimantan reached Rp39,622,240 in 2020 and has shown a consistent upward trend over the past five years. While the growth trend of per capita expenditure in West Kalimantan mirrors the national level, significant nominal differences have persisted over this five-year period. A substantial nominal gap remains between the regional figure and the national average despite the

upward trend aligning with national per capita expenditure growth relative to the 2020 national figure of Rp57,154,140.

These conditions indicate that while the standard of living in West Kalimantan is improving, it has not yet fully caught up to national levels. This gap is crucial for interpreting the regression results regarding per capita Gross Regional Domestic Product (GRDP), as economic growth does not always translate proportionally into improved public welfare. In other words, increased economic activity needs to be accompanied by distribution mechanisms and public policies capable of translating economic growth into improved access to education and healthcare, as well as a better standard of living.

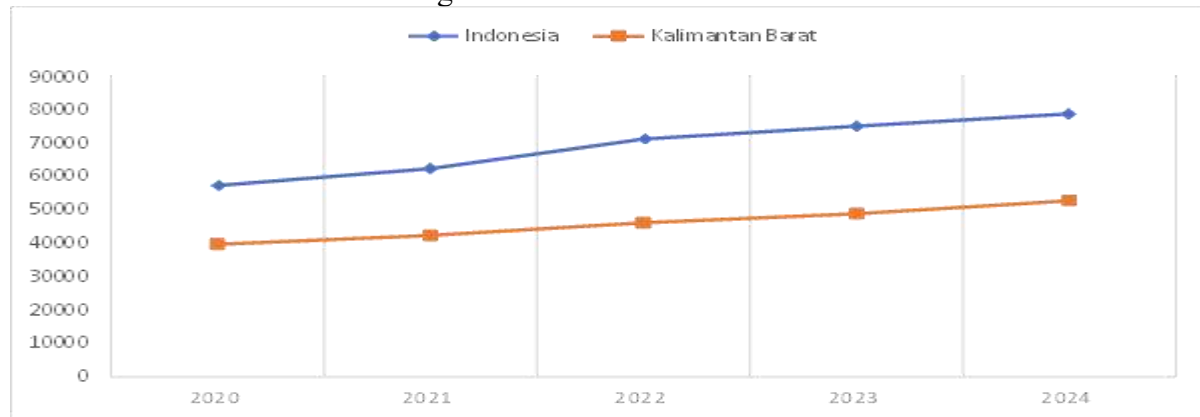


Figure 5. GRDP per capita in West Kalimantan and Indonesia, 2020-2024

Source: Bureau of Statistics, processed (2025)

The selection of the most efficient panel data regression model is based on the test results, and the following steps are proposed. The determination is made by comparing the outcomes from pooled least squares, a fixed effect model, and a random-effects model. The testing process commences with the Chow Test to compare PLS and FEM, followed by the Hausman Test to verify consistency between FEM and REM, and the Lagrange Multiplier (LM) Test to confirm the validity of the chosen model. The test results are summarised in the table below.

Table 2. Model Test Results

Best Model Test	Probability Chi-Sq	Best Model Test
Chow Test	0.0000	Chow Test
Hausman Test	0.2511	Hausman Test

Source: Bureau of Statistics, processed (2025)

The Hausman test probability value of 0.2511 suggests that the REM model is superior to the FEM model. No further testing was therefore necessary. The estimation model utilised in this study employed REM. The selection of the REM indicates that unobserved specific characteristics across regencies/cities are more appropriately treated as random effects within the model. This is relevant because the regencies/cities in West Kalimantan possess distinct geographical, demographic, and socio-economic characteristics. These differing characteristics potentially influence human development outcomes but cannot be fully represented by the variables included in the model. By using the REM, such individual variations are accounted for during the estimation process, allowing the model to capture heterogeneity across regencies/cities.

Table 3. Random Effects Model (REM) Estimation Results

Variable	Coefficient	Probability
GRDP per capita	0.000148	0.0000***
APBD Education	-7.11395	0.0075***
APBD Health	4.267173	0.1956
Mean Years of Schooling	2.624674	0.0000***

Note : The *** and ** symbols indicate significance at the 1 percent and 5 percent levels, respectively.

Source: Processed results from E-views 12

Statistical assessment of the research model includes the coefficient of determination (R^2) and the F-statistic test. The model's coefficient of determination (R^2) is 0.864726, indicating that the independent variables contribute 86% to explaining the dependent variable. Meanwhile, the F-statistics probability result falling below the 5% significance level confirms that, collectively, all independent variables in this study possess significant explanatory power regarding the dependent variable. An R^2 value of 0.864726 indicates that approximately 86.47% of the variation in the Human Development Index (HDI) within the study sample can be jointly explained by GRDP per capita, education expenditure, health expenditure, and the average years of schooling. The model's high explanatory power demonstrates that economic conditions, educational attainment, and fiscal policies constitute a relevant set of factors for explaining variations in human development across regencies and cities in West Kalimantan. Meanwhile, approximately 13.53% of the HDI variation is explained by factors outside the model. Thus, human development cannot be fully explained solely by the economic, educational, and government expenditure variables used in this study.

Determinants of the Human Development Index

The Random Effects Model results obtained using EViews 12 software, as presented in Table 3, indicate that GRDP per capita, regional budget (APBD) allocations for education, and average years of schooling are significant predictors of the Human Development Index (HDI) in West Kalimantan Province at the 1% significance level. APBD allocations for the health sector in West Kalimantan do not have a significant impact on the region's HDI achievement. The Human Development Index (HDI) is partially influenced by Gross Regional Domestic Product (GRDP) per capita. Significance is evident from the t-statistics probability value of 0.0000, however, the coefficient value is only 0.000148. This implies that a 1% increase in GRDP per capita results in an HDI increase of 0.000148 points, an impact considered very small. These findings indicate that while economic conditions do share a positive and significant relationship with human development, the magnitude of the coefficient suggests that increased economic capacity has not yet fully translated into substantial improvements in the HDI. Substantively, economic growth supports human development but is not the sole mechanism determining improvements in the quality of life. The human development approach views income as a means to expand human choices and capabilities, rather than as the goal of development itself. This limited impact reflects the fact that economic growth in West Kalimantan has not yet served as a primary driver for a proportional improvement in the quality of human capital.

The region's economic structure dominated by extractive commodities such as palm oil plantations explains this phenomenon. This sector tends to be capital-intensive, resulting in wealth being concentrated among capital owners rather than distributed inclusively to the local community. This situation indicates that GDP growth does not automatically translate into a direct improvement in living standards or an increase in the purchasing power of the general public. Research by Nduru et al. (2025) found that the high economic value of the CPO (Crude Palm Oil) sector in Riau Province has not yet resulted in significant welfare improvements for local villages. This disparity arises because the majority of corporate profits are channeled out of the region rather than being reinvested to drive the local economy.

Thus, the findings regarding per capita GRDP in this study demonstrate that economic growth and human development are interconnected yet distinct concepts. Economic growth exerts a greater impact on the Human Development Index (HDI) when increased economic activity translates into improved access to education and healthcare services, as well as broader economic opportunities. These findings underscore the importance of policies that focus not only on increasing economic output but also on mechanisms for distributing the benefits of growth to the community.

This study also highlights the role of fiscal policy, specifically spending on health and education in the context of human development in West Kalimantan. The coefficient for the education allocation within the Regional Budget (APBD) is -7.11395, with a t-statistics probability value of 0.0075. Statistically, the APBD allocation for education has a significant negative impact on the Human Development Index (HDI) in West Kalimantan. This finding warrants close attention, as it indicates that the increase in education budget allocations in West Kalimantan during the observation period did not lead to an improvement in the HDI. The primary causes are likely inefficient allocation and distribution that failed to effectively target the intended beneficiaries.

However, this negative coefficient cannot be immediately interpreted to mean that education spending hinders human development. A more cautious interpretation is that a nominal increase in education spending did not automatically result in improved educational outcomes during the observation period. From the perspective of Human Capital Theory, education constitutes an investment in human capital that yields benefits through enhanced knowledge, skills, and productive capacity. Therefore, the effectiveness of such investment is determined not merely by the size of the budget, but by the budget's ability to generate tangible educational achievements (Becker, 1964).

This negative relationship may also be attributed to the time lag between government spending (as an input) and human development (as an outcome). A budget allocated in one period does not necessarily produce changes in the Average Years of Schooling (RLS) or Human Development Index (HDI) components within that same period. Furthermore, the size of the budget does not directly reveal information regarding program quality, the efficiency of budget utilization, targeting accuracy, or the equitable distribution of benefits. The World Bank (2020) emphasizes that the quality of public spending in Indonesia should be assessed based on the government's ability to deliver services and development outcomes, rather than solely on the magnitude of the budget.

Although seemingly paradoxical, this finding is corroborated by a study conducted in a comparable region East Kalimantan by Oktafiyana (2024), which reached a similar conclusion. The regional education budget variable showed a negative relationship, whereas the average years of schooling variable exerted a strong positive influence on the HDI, with a coefficient of 2.624674, this indicates that a 1% increase in the average years of schooling is predicted to result in a 2.624674 point rise in the HDI. This variable demonstrated the highest level of significance in influencing the HDI in West Kalimantan, supporting the findings of an earlier study by Raffi (2025).

The divergent directions of influence observed between education spending and the average years of schooling constitute a key finding of this research. Education spending represents resources or inputs allocated by the government, whereas the average years of schooling represents educational achievements accumulated within the population. The results indicate that actual educational attainment bears a stronger relationship to the HDI than the mere size of the education budget. These findings support the human capital perspective that the benefits of education for human development emerge when such investments are successfully converted into knowledge, skills, and the accumulated education of the population (Becker, 1964).

These findings align with research by Dwipatna (2025), which indicates that government education spending is linked to educational outcomes in Indonesia, yet the efficiency of budget utilization varies across regions. This demonstrates that the size of the budget and development achievements do not always correspond directly, as the effectiveness of public resource utilization plays a crucial role in determining final outcomes.

Consequently, the policy implication of these findings is not to reduce education spending, but rather to improve the quality and effectiveness of its utilization. Education policy in West Kalimantan should be directed toward enhancing outcomes such as increasing the duration of schooling, ensuring educational continuity, improving learning quality and access, and ensuring the equitable distribution of program benefits. Such an orientation is essential to ensure that increased fiscal inputs can truly be converted into enhanced human capital.

The health variable within the regional budget (APBD) shows a positive coefficient of 4.267173 with a probability value of 0.1956, however, it is not statistically significant. Based on this model, health budget allocations do not have a statistically significant impact on the HDI in West Kalimantan. The positive yet insignificant coefficient indicates that while the direction of the relationship between health spending and the HDI aligns with theoretical expectations, the statistical evidence is insufficient to conclude that changes in health spending during the study period were consistently accompanied by changes in the HDI. This may occur because health spending requires time to yield changes in health indicators. Furthermore, the HDI is an aggregate indicator encompassing dimensions of health, education, and standard of living, consequently, the impact of health spending on the overall index may be indirect.

These findings differ from previous studies such as those by Arafat & Rindayati (2018) and Ulya & Imtikhanah (2023) which identified a significant positive relationship between regional health budgets and the HDI in Central Kalimantan.

Increased health budgets have not yet significantly contributed to HDI improvement in West Kalimantan in the short term. This is primarily due to accessibility and distribution issues stemming from geographical challenges such as a vast territory with low population density which hinder access to health facilities for communities in remote areas (Perbendaharaan, 2020). These findings also support earlier research (Damayanti & Suryaningrum, 2023) indicating that government spending in the health sector does not affect the HDI.

In the context of West Kalimantan, these geographical characteristics provide a crucial empirical explanation. Additional health funding does not necessarily lead to improved health outcomes if increased spending is not accompanied by the equitable distribution of facilities, healthcare personnel, and service access in remote regions.

These findings align with the perspective that improvements in the quality of public spending must be assessed based on the government's ability to transform fiscal resources into public services and development outcomes (World Bank, 2020). In the context of health, a larger budget yields human development benefits only if it succeeds in improving the access to and quality of services actually received by the public. Therefore, the lack of statistical significance regarding health expenditure in this study suggests that the effectiveness and equitable distribution of spending remain policy challenges in West Kalimantan.

The study results reveal a disparity between government-allocated resources and the resulting human development outcomes. Per capita GRDP exerts a positive and significant influence, albeit with a relatively small coefficient. Mean Years of Schooling (RLS) shows a strong positive influence, conversely, education expenditure exhibits a negative relationship, and health expenditure shows no statistically significant effect. This pattern indicates that human development in West Kalimantan is more closely linked to accumulated human capital than to the sheer magnitude of allocated fiscal resources. With this approach, improvements in the Human Development Index (HDI) in West Kalimantan are measured not merely by budget increases or

economic growth, but by the extent to which these resources successfully enhance the community's capabilities and quality of life in tangible ways.

CONCLUSIONS

The study finds that per capita GRDP, regional budget allocations for education, and average years of schooling are key factors that significantly impact the Human Development Index in West Kalimantan Province, whereas APBD allocations for health did not have a significant effect during the 2020–2024 period. The per capita GRDP has a significant positive impact on the HDI, albeit with a relatively small effect size. The data suggests that economic growth in West Kalimantan has not yet translated into a corresponding enhancement in human capital standards. An economic structure that still relies on commodity-based and capital-intensive sectors may hinder the optimal distribution of economic growth benefits among the population.

The average years of schooling is the most significant factor in explaining improvements in HDI. The actual education received by the community has a more significant relationship with human development than the amount of fiscal resources allocated to the education sector. APBD allocations for education demonstrated a significant and negative impact on the HDI. This finding does not suggest that education spending is unwarranted, instead, it suggests that nominal budget increases do not inevitably result in improved human development outcomes. The disparity between the direction of education spending's influence and average years of schooling implies potential problems with effectiveness, targeting precision, expenditure composition, and the delay between budget allocation and educational results.

The APBD allocations for health had a positive correlation, although the outcome was not statistically significant. The direction of health spending policy is aligned with the goal of advancing human development, but its impact has been insufficient to produce noticeable changes in the Human Development Index (HDI) over the study period. West Kalimantan's vast geography, low population density, and limited access to healthcare facilities and personnel may be factors hindering the translation of health spending into public health outcomes. A large health budget is insufficient on its own unless it is accompanied by the equitable distribution of facilities, health personnel, and access to services in remote areas.

This study contributes by integrating economic factors, educational attainment, and fiscal instruments for education and health to examine the determinants of HDI at the regency/city level in West Kalimantan. This approach provides a more comprehensive perspective than studies which rely solely on educational attainment indicators or economic conditions as determinants of human development. The results also show a distinction between government spending and human development outcomes, indicating that increased government spending does not automatically result in improved HDI without effective and precise allocation. Empirical evidence supports the notion that human development policies should be outcome-driven, rather than solely focused on expanding budget allocations.

This study suggests that local governments should move their focus away from simply raising budget numbers and instead concentrate on making their spending more effective and achieving better human development results. Education policies should focus on initiatives that boost the average years of schooling, guarantee continuous learning, lower dropout rates, broaden access for underprivileged groups and areas, and enhance the quality of education. Evaluations of budgets are also necessary to ensure that increased spending on education genuinely leads to improved educational outcomes rather than simply increasing fiscal inputs.

Budget policies in the health sector should prioritise equitable access to services over merely increasing overall expenditure.

Local governments must improve the distribution of healthcare facilities and medical staff, especially in remote and inaccessible regions, and adjust resource allocation according to the unique geographical features of each regency or city. Local governments should encourage

commodity-based economic growth, thereby generating greater spillover benefits for local communities by expanding employment opportunities, strengthening linkages with local businesses, and investing in education and basic services. Economic growth can be more effectively translated into improved quality of life and human development in this manner.

Future research could expand the analysis by incorporating dimensions of government spending quality and efficiency, rather than solely relying on the nominal value of regional budgets (APBD). Investments in education and health typically yield impacts over the medium to long term, suggesting that future studies should consider the time lag between government expenditure and human development outcomes. Subsequent research could also conduct a spatial analysis at the regency or city level to identify the influence of location, accessibility, and spatial spillover effects across different regions. Using more specific indicators, including per capita spending, direct expenditure on basic services, the ratio of health workers, the availability of healthcare facilities, school dropout rates, and education quality, could also offer a deeper understanding of the mechanisms behind the variations in human development across West Kalimantan.

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