
Determinants of The Human Development Index (Case Study of 12 Districts in East Java)

¹ Amalia Elena Putri, Universitas Muhammadiyah Malang, Indonesia

² Dwi Susilowati, Universitas Muhammadiyah Malang, Indonesia

Article Information

Submitted: 1 December 2023

Revision: 16 February 2024

Accepted: 1 April 2024

Keywords:

Poverty, Economic Growth,
Sanitation, Clean Water,
Human Development Index

Abstract

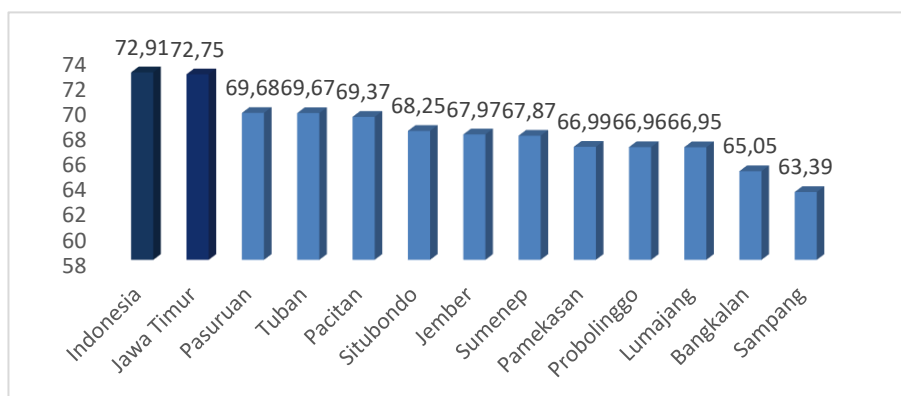
All countries face human development problems. As indicated by the relatively low level of the HDI. The quality of human life is an important factor in the development process. Of the 38 cities/districts in East Java, there are 12 districts that require attention because they are categorized as moderate HDI levels by 2022. Therefore, it is important to make efforts to improve the quality of human development during the development process. This study aims to examine the independent socio-economic variables of poverty, economic growth, sanitation, and clean water on the dependent variable, namely the human development index in 12 districts of East Java Province in 2015-2022. This research uses panel data with the best model selection, namely the fixed effect model, and the test criteria are set at an error rate of 5%. The analysis results in an Adj R-Square value of 93.79%, which indicates a strong correlation between variables. The remaining 6.21% can be attributed to other factors not included in the analysis. Specifically, the results of this study explain the variables that affect and do not affect the human development index.

INTRODUCTION

Development is a multifaceted process or strategy that incorporates different viewpoints and entails significant alterations to national institutions, social structures, and community attitudes (Abidin et al., 2023). In the 1970s, the tool used to measure the success of development in a region was seen from high economic growth. But in reality, the standard of living of the population is not rising in developing countries that are experiencing high economic growth. Therefore, a new concept emerged to measure the success of human-oriented development (*Badan Pusat Statistik, 2022*). Referring to this concept, development success can be evaluated by not only prioritizing economic growth, but also the quality of life in each region or aspects of human development (Sumarsono & Novarinda, 2016).

Human development is the progression that expands opportunity for individuals to make decisions without limitations. This implies that people are allowed to make more choices that will fulfill their basic needs, especially in terms of obtaining development outcomes, such as education, income, and health (*Badan Pusat Statistik, 2022*). The UNDP established the Human Development Index (HDI) as a metric to assess the effectiveness and advancement of human development in a given area. The index includes the dimensions of health, education, and expenditure as its three basic components. Human development can expand the opportunities available to individuals and provide the freedom to improve personal well-being. The HDI highlights how important it is for people to reach their full potential so that they can engage in social and economic life (Suparta & Septian, 2023). HDI can also refer to the classification or level of development of a region (Komariyah et al., 2023). The HDI classification aims to classify human development which is divided into four categories, namely the low (HDI ≤ 60), the medium (HDI $60 \leq 70$), high (HDI $70 \leq 80$), and very high category (HDI ≥ 80) (*Badan Pusat Statistik, 2022*).

In assessing the level of HDI, East Java Province has a level of human development that from year to year shows an increased although it tends to be quite slow trend of 0.61 points so that in 2022 it reaches 72,75 percent which is classified as high. On the other hand, in the same year, East Java ranks sixth out of six compared to the HDI value of the provinces on the island of Java. The province has the lowest HDI on the island of Java and is below Indonesia's national HDI value. It was also found that out of 38 cities/districts in East Java, 12 of them have human development index values that are under $\leq 70\%$ less than the national average or below the high category. Pasuruan has the highest HDI at 69.68, while Sampang has the lowest HDI among the 12 districts at 63.39. Figure one below is an illustration of the value of the Human Development Index, a description of the HDI value calculated by the new method.



Source: BPS, 2022.

Figure 1. HDI of 12 Districts In East Java

Poverty in a location can impede human development. Poverty that is not immediately addressed can create a new “vicious cycle of poverty”. The explanation of the vicious cycle of poverty is shown by the existence of lower incomes, causing a lack of demand, low productivity which will have an impact on weak income levels and will ultimately slow down human development. Individuals residing in impoverished circumstances typically exhibit suboptimal productivity. They are usually used as objects rather than subjects of development, and they are rarely encouraged to participate in development activities. According to Korten (1987) theory of people centered development, poverty can be reduced if development is focused on human development. Development that focuses on the knowledge and skills possessed by the community, so that they can become subjects or actors in their own development, not just objects. This is because education and training can increase community productivity (Erlando et al., 2020). Based on the association between poverty and the quality of human development, it can be seen that a rise in the number of poor individuals can lead to lower quality of human development, and vice versa. However, the empirical impact of poverty on human development has different results. Previous research conducted by Harahap et al. (2020) found that the poverty rate has a significant effect on the human development index in Indonesia. Nevertheless, prior studies conducted by Ramadhani (2021) demonstrates that poverty has no impact on the human development index.

Research that has been conducted in the field of economics identifies that economic growth is one aspect that can affect the human development index. When economic growth conditions in a location improve, then, it is expected to increase people's income through UMP (Upah Minimum Provinsi). According to (Husril et al., 2021) economic growth indicates the degree to which an economy's operations will increase overall public revenue over a given time frame. Considering that one aspect of the formation of HDI is expenditure, which is measured by purchasing power through people's income (Muliza et al., 2017). Research conducted by (Anam et al., 2021) found that the gross domestic product has an impact on improving human development.

Another thing that makes it possible to improve human resources as development actors is related to the fulfillment of basic needs. related to the basic characteristics of successful human development, namely the fulfillment of needs in all fields. The most basic needs that must be met to sustain human life are water and sanitation (Hermawan & Sulastri, 2023). Social factors such as environmental sanitation and clear water can affect the human condition. Another thing that makes it possible to improve human resources as development actors is related to the fulfillment of basic needs. related to the basic characteristics of successful human development, namely the fulfillment of needs in all fields. The most basic needs that must be met to sustain human life are water and sanitation (Hermawan & Sulastri, 2023). Given that water is used in various activities, such as consumption, household support, and used in industrial activities (Mulyanti, 2022). The quality of water used is a determinant in human health (Slamet, 2011), so the availability of clean water and good sanitation plays an important role in human health, which ultimately has an impact on human and state development (Rahmizal & Annisa, 2022). It can be said that the development of better sanitation and easy access to clean water will have an impact on the high level of public health, thus causing the HDI to increase. According to previous research conducted by (Sapkota, 2014), the results show that the development of sanitation and drainage infrastructure can increase the Human Development Index.

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human health (Slamet, 2011), thus the availability of clean water and good sanitation plays an important role in human health, which ultimately has an impact on human and state development (Rahmizal & Annisa, 2022). It can be said that the development of better sanitation and easy access to clean water will have an impact on the high level of public health, thus causing the HDI to increase. According to previous research conducted by (Sapkota, 2014), the results show that the development of sanitation and drainage infrastructure can increase the Human Development Index.

This study involves the HDI of 12 districts in East Java Province that have values below ($\leq 70\%$) and includes several socio-economic variables such as poverty, economic growth, sanitation, and clean water as research variables. This topic is urgent to research because it refers to the National Priorities in the Government Work Plan for 2022 which strive to improve personal quality and competitiveness. Thus, based on the description above, it suggests that special attention is needed to human development in 12 districts of East Java Province with under ($\leq 70\%$) OF HDI category. The author conducted this study aims to identify the factors that influence human development in 12 districts of East Java Province using several variables, namely poverty, economic growth, sanitation, and clean water.

RESEARCH METHODOLOGY

The methodology for this study is quantitative, which is an approach related to numerical data. Research tools used e-views 12 program and panel data regression analysis were used in this study, to seek identify the factors that influence the human development index. Panel data is a type of data that combines cross-sectional information and time series. The time series data spans from 2015 to 2022, while the cross sectional data is limited to 12 districts in East Java Province. This study uses a total of 96 observations and uses secondary data. Secondary data is data obtained from a second source, in other words, the data source is not directly given to the researcher but recorded by another party. In detail for five variables obtained from *Badan Pusat Statistik* East Java.

Table 1.
Operational Variables

No	Variable	Description	Source
1	HDI	Human Development Index in percentage terms in 12 districts of East Java Province using the new method, with life expectancy data calculated using projected SP2010 results.	BPS
2	Poverty (POV)	Poor population at the poverty line in percent (%)	BPS
3	(LOG_GGROWTH)	Gross Regional Domestic Product at Constant Prices by 12 districts in the form of (billion rupiah)	BPS
4	Sanitation (SN)	percentage of homes with access to sanitary facilities that are adequate.	BPS
5	Clean Water (CW)	Percentage of houses with access to facilities that provide clean water.	BPS

Source: BPS, 2022

Using panel data has the advantage of making the data more informative, the variability is more significant, and the collinearity is low and the panel data has the advantage that there is no need to test classical assumptions (Gujarati, Damodar N., 2015). There are several panel data regression modeling, namely CEM, FEM, and REM (Gujarati, Damodar N., 2015). When conducting panel data regression research, it is imperative to identify the appropriate reference

model to interpret the regression results and conduct research tests. This process involves the use of statistical methods such as the Chow, Hausman, and Lagrange Multiplier test where appropriate. The regression equation model is shown as below:

$$HDI_{it} = -\beta_0 - \beta_1POV_{it} + \beta_2LOG_GROWTH_{it} + \beta_3SN_{it} + \beta_4CW_{it} + \varepsilon_{it}$$

Note:

- HDI* = Human Development Index
- POV* = Poverty
- LOG_GROWTH* = Economic Growth
- SN* = Sanitation
- CW* = Clean water
- β_0 = Constant
- β_0, \dots, β_4 = Regression Coefficient
- i* = Entities and Periods
- t* = Year
- ε = Error term

RESULTS AND DISCUSSION

The purpose of this research is to determine which independent variables affect HDI in 12 districts in East Java Province. Poverty, economic growth, access to clean water, and sanitation are among the variables considered. Finding the ideal or best model to use as a reference in research is the first stage in the panel data analysis approach. One of the three models will be selected after obtaining the Chow test results which show that the cross-section prob chi-square value is 0.0000, which is smaller than the 5% significance level ($\alpha = 0.05\%$) which implies that the fixed effect is chosen over the common effect. Hausman test, used to compare the random effect (RE) and the fixed effect model (FEM). The prob value of random cross-sections obtained from the Hausman test is 0.0000, which is smaller than the $\alpha = 0.05\%$. This indicates that the Random Effect Model (REM) is less appropriate to use in this study compared to the Fixed Effect Model (FEM). The LM test is not needed because the two tests have given the result that the fixed effect model is better. So that the fixed effect model is determined as the most appropriate model for this study.

Table 2.
Best Model Used

Test	Effect Test	Probability	Desc
Chow test	Cross-section Chi-Square	0.0000	Selecting a Fixed Effect
Hausman test	Cross-section Random	0.0000	Selecting a Fixed Effect

Source: Processing by researchers with Eviews 12 Software, 2023.

Table 3 presents the test results. The table shows that the probability value (F-statistic) is 0.000000, smaller than the 5% significant value. This indicates that poverty, economic growth, clean water, and sanitation simultaneously impact the HDI variable at the same time. The t-test or partially results in the poverty variable having a negative impact but insignificant

on HDI, the economic growth variable has a positive impact and a significant effect on HDI, sanitation has a positive impact and a significant effect on HDI, and clean water has a positive impact and effect on HDI. The coefficient of determination (adjusted-R2) value of 0.937958, the Human Development Index is primarily influenced by factors such as poverty, economic growth, sanitation, and clean water, accounting for 93.79% of the variation, with just 6.21% attributed to external variables.

Table 3.
Best Model Selected

Variables	Coefficient	t-Statistic	Prob.
C	-47.43663	-2.774836	0.0069
POV	-0.041230	-0.448136	0.6553
LOG_GROWTH	10.46661	6.191514	0.0000
SN	0.061076	4.581895	0.0000
CW	0.058765	2.794170	0.0065
Diagnostic Tools			
Adjusted R-squared	0.937958		
Prob (F-statistic)	0.000000		

Source: Processing by researchers with Eviews 12 Software, 2023.

Following the panel regression analysis, the equation below shows:

$$HDI = -47.43663 - 0.041230POV + 10.46661LOG_GROWTH + 0.061076SN + 0.058765CW + \varepsilon_{it}$$

According to the aforementioned equation, Poverty regression coefficient values is -0.0412. This suggests that in the 12 districts, the measure of HDI will decline by 0.0412 for every one percentage point rise in the poverty rate and conversely. The number that shows 10.4666 is the coefficient value of economic growth observed through the Gross Regional Product (GRDP). This indicates that the human development index rises by 10.4666 for every 1% increase in economic growth. Furthermore, the variables related to sanitation and clean water have coefficient values of 0.0610 and 0.0587, respectively. An increase of one percentage in sanitation will result in a 0.0610 an improvement in the indicator of human development index Likewise, a 1% rise in clean water will result in a 0.0587 rise in the human development index.

The poverty variable has a negative but insignificant effect on the HDI in this study. The findings of this study contradict theory and research (Kusuma & Faridatussalam, 2022; Komariyah et al., 2023) which found that poverty has a significant effect on HDI. The poverty rate in the 12 districts of East Java Province is still relatively high, which reflects that people have not been able to fulfill their basic needs, such as fulfilling the necessities of life, maintaining human dignity, and carrying out daily life. Nurkse (1971) concept of vicious circle of poverty postulates that an individual experiencing poverty is likely to be low-productivity, which leads to little revenue earned. As a result, they are unlikely to have savings or investments and will continue to live in impoverished socioeconomic circumstances (Siti Rohima, 2013).

However, in this study, the poverty variable does not automatically affect the achievement of the HDI in the 12 districts of East Java province. It does not mean that a poor person cannot do something, small things done such as the desire to go to school can

support humans in improving the quality of resources that can ultimately improve human development. This can be illustrated in the data on school expectancy, which is included in the basic components of HDI formation. The data on the expected years of schooling in the 12 districts on average experienced an improvement or increase each year. This shows that the population aged seven years and over has the opportunity to attend school until they graduate from senior high school (*Badan Pusat Statistik, 2022*). The East Java government has also developed a number of policies, including various types of programs distributed through educational institutions and free health services for those in need. This means that, while poverty in East Java fluctuates and remains generally high, people can still sense their basic necessities. This can boost human development. The results of this study are supported by (Khikmah et al., 2020; Senewe et al., 2021; Pratiwi Herman & Muljaningsih, 2022) who found that poverty has a negative but insignificant effect on human development.

The economic growth variable has a positive and significant effect on the human development index. GRDP is one of the indicators used to see the level of economic growth in a region, and is used in this study as an economic aspect. Looking at the economic growth data through GDP in 12 districts in East Java Province each year that fluctuates towards an increase, this should reflect the socio-economic conditions of the region. However, it transpires that the value of the human development index is still in the medium category when 2022.. High economic growth reflects that people are productive and causes changes in high consumption patterns. The high purchasing power of the community indicates that they are able to meet their needs in terms of health, education, food, which will affect the improvement of the quality of human development. The fulfillment of people's needs by the income spent on the economic sector will have an impact on the rotation of the economy in a region.

Theoretically when the economy grows, the quality of human development will also improve. According to the new economic growth theory of (Todaro, M. P., & Smith, 2015), public and private investments in resources or human capital can generate positive external economies and increase human productivity. In addition, these findings are also supported by Lonni who states that a high economy seen from the economic growth of a region can improve the quality of human resources, the source of improving human quality can be obtained from government spending in the health sector, spending in education, and facilities that can support the improvement of the quality of human resources (Lonni et al., 2012). Then (widani & Erawati, 2016) in Bali, (Zumaeroh et al., 2023) in Papua, (Muslikhati, 2018) in Indonesia showed the same results that economic growth seen through GRDP had an effect on increasing the Human Development Index (HDI). This research is not in line with (Regina et al., 2020) who found that economic growth has no significant effect on HDI.

Sanitation has a favorable and considerable impact on the human development index. Social factors such as environmental sanitation can affect the human condition. proportional to the sanitation coverage rate among households, which is still low Good sanitation will automatically benefit its users by preventing the spread of diseases caused by human feces or waste. Infections caused by poor sanitation can lead to lost productivity as infected people cannot contribute productively to the economy. It can be seen that the composite indicator of life expectancy, which is part of the HDI calculation, can be achieved by providing basic infrastructure for people. However inversely proportional to the sanitation coverage rate among households, data Badan Pusat Indonesia reveals that there are still numerous locations in Bondowoso, Situbondo, Probolinggo, Bangkalan, Pamekasan, and Andumenep districts that do not have their own toilets, as evidenced by low sanitation values. Districts with poor sanitation tend to have lower HDI values. This is consistent with Human Capital

theory which asserts that development in the health sector will improve quality and productivity through community welfare, thus improving development in terms of human quality, a statement supported by Hariani & Ekaria (2023). The findings of this study are in line with Purwaningsih et al. (2021) Melliana & Zain (2013) which state that sanitation affects human development, but these findings contradict the findings of (Lal & I., 2019), which found that sanitation does not affect human development.

The clean water variable has a significant and positive influence. Access to clean water is the most basic human need that must be met to support human productivity. Statistics on homes in 12 districts in the province of East Java that have access to clean drinking water shows that the number of households with access to safe drinking water is high (*Badan Pusat Statistik, 2022*). People can carry out various activities that benefit them if clean water is available, but conversely, if there is a lack of access to clean water, it can cause disease and have a negative impact on economic conditions (Daulay et al., 2021). Using poor quality water can have health implications as it can be a conduit for the spread of disease. (Slamet, 2011). In the long term, the availability of clean water can reduce the risk of diseases such as indigestion, diarrhea, cholera, and other diseases caused by poor water quality. The greater the availability of clean water, the better the environment and improved disease prevention, lower health care costs and ultimately improved human development. An important point is that clean water does have an impact on people, especially human health (Li & Wu, 2019)

Clean water plays an important role in the sustainability of daily economic activities (Sukartini & Saleh, 2016). This is in accordance with the Human Capital theory, which states that development that can support health will improve quality and productivity through community welfare, thereby increasing development in terms of human quality. Meeting basic needs is one way to improve the human development index. This study contradicts the findings of (Purwaningsih et al., 2021), who found that in Central Java, clean water had no effect on human development between 2015 and 2018 due to adequate access to clean water. Without public awareness of a healthy lifestyle, access to clean water will not function properly and will not affect human development.

CONCLUSIONS AND RECOMMENDATION

Conclusion

This study aims to find out the correlation between the human development index and the following factors: poverty, economic growth, sanitation, and clean water in twelve districts of East Java Province. This study shows that poverty has a negative and non-significant effect on the Human Development Index. In addition, economic growth has a significant and positive influence on the Human Development Index. Furthermore, access to sanitation and clean water significantly and positively influences HDI in the twelve districts of East Java Province. Consequently, HDI is simultaneously influenced by the independent variables.

Recommendation

This research can serve as a reference for the East Java Provincial government to emphasize the importance of improving human development in the 12 districts of East Java Province. The government is expected to continue to reduce the poverty rate, provide assistance to the underprivileged, and educate the public, especially in the Bondowoso, Situbondo, Probolinggo, Bangkalan, Pamekasan, and Sumenep districts about the importance of sanitation and clean water because there are still households that do not have toilets or good sanitation. The results showed that economic growth is a variable that has a major influence on

the Human Development Index in 12 districts in East Java Province. With the high economic growth that can affect government activities, it is expected that the government will help facilitate education, health infrastructure which includes sanitation and clean water so as to increase the value of the Human Development Index.

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