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Determination of Human Development Index Based on Classification of Indonesian Women in 2015-2023

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ABSTRACT

Gender equality and women's empowerment are key elements in achieving sustainable social, economic and cultural development. This research aims to analyze the factors that influence the Human Development Index (HDI) of women in Indonesia using a multiple regression model. The independent variables used in this research are the percentage of women's poverty (X1) and women's life expectancy (X2), which were chosen based on their relevance to improving women's quality of life. The data used is sourced from the Indonesian Central Statistics Agency and covers the relevant period for analysis. The analysis tool uses multiple regression. This research evaluates the extent to which these two variables influence women's HDI in Indonesia. The results of the analysis show that variables X1 and X2 have different influences on women's HDI. Based on the research results, it is recommended that women's development policies focus more on reducing poverty, increasing access to education for women of productive age, and improving the quality of life to increase women's life expectancy. This research provides insight for policy designers in formulating more effective programs to improve the quality of life of women in Indonesia.

Keywords: *Human Development Index, Gender, Poverty, Education*

1. INTRODUCTION

The Human Development Index (HDI) is an important indicator in measuring the quality of life and welfare of a country's people. Improving the quality of life of women is one of the main goals in social and economic development. However, despite various efforts to improve the quality of life of women, there are still major challenges that affect the welfare of women in various regions. One important factor that affects the quality of life of women is poverty. Women, especially in certain areas, are often more vulnerable to poverty than men, affecting their ability to access education, health, and decent work. The Human Development Index (HDI) is a very important measure to assess success in achieving human development. Both, human development and infrastructure, must run simultaneously so that there is no imbalance between the two. If both support each other, economic development can run faster and be better managed through adequate human resources. However, if these two aspects do not run in harmony, economic development will be hampered. Good infrastructure without being balanced by effective human resource management will result in slower economic growth than desired [1].

Poverty remains one of the biggest challenges in human development in many developing countries, including Indonesia. In general, poverty describes a condition where individuals or groups of people do not have enough resources to meet basic needs such as food, clothing, shelter, and access to health services and education. Poverty can hinder opportunities to develop and improve the quality of life [2].

The number of women below the poverty line (X1) is one of the important variables in describing the extent of the challenges faced by women in terms of economic access and resources. Women's Life Expectancy (X2) is also an important indicator in measuring the success of health development and women's quality of life. Good health quality, reflected in high life expectancy, is

closely related to factors such as access to adequate health services, lifestyle, and policies that support women's welfare [3].

Several studies have shown a positive relationship between life expectancy and HDI. Research conducted by several researchers in developing countries revealed that countries with higher life expectancy usually have higher HDI. Higher life expectancy plays a very important role in improving HDI because it reflects better health quality. Countries that succeed in increasing life expectancy through effective health policies, improving access to medical services, nutrition, and sanitation usually also experience an increase in the quality of life reflected in the HDI [4].

There is something interesting about the data shown by the Central Statistics Agency

Table 1. Indonesia's Open Unemployment Rate in 2023 (%)

Man	5.45
Woman	5.32

The data shows that the open unemployment rate for women is lower than for men. There is a difference of 0.13 percent. One reason why women's unemployment may appear lower is because women's participation rates in the workforce in some countries or regions are lower than those of men. This is due to various factors, such as women's traditional roles in the household, childcare responsibilities, or limited access to jobs.

There is something interesting from the 2023 Central Statistics Agency data regarding the Proportion of Youth Aged 15-24 Years Who Work Based on Gender, as follows:

Table 2. Proportion of Adolescents and Adults Aged 15-24 Years Employment by Gender in 2023 (%)

Man	94.11
Woman	94.52

The data shows that the number of teenage workers is 0.41% more female than male. If the female labor force participation rate is low, then the number of women counted as unemployed is also lower, even though they are not fully involved in formal economic activities. Many women work in the informal sector which is not recorded in open unemployment statistics. This sector includes jobs such as street vendors, domestic workers, or freelancers. Work in the informal sector is often not counted as part of open unemployment, even though the status of the job may be unstable or does not meet adequate work standards.

Technology can be a tool of empowerment for women, giving them greater access to education, information and economic opportunities. Through digital platforms, women can learn new skills, start their own businesses or connect with global communities to share knowledge and experiences. More and more women are involved in software development, artificial intelligence and blockchain technology, and are becoming successful technology entrepreneurs. The development of digital media has brought about changes in various areas of life and accompanied the rate of development of human resources. Digital literacy is carried out as an effort to build human resources. [5]

Technology has great potential to empower women and create economic, social and educational opportunities. However, there are still many challenges to be overcome to ensure

women have equal access to these fields. Supporting education, creating an inclusive environment and raising awareness about gender equality can open up more opportunities for women to contribute to the world of technology and benefit from rapid digital progress.

2. LITERATURE REVIEW

2.1 Human Development Index

The Human Development Index (HDI) is a composite indicator used to measure the level of human well-being and quality of life in a country or region. First introduced by the United Nations Development Programme (UNDP) in 1990, the HDI consists of three main dimensions: life expectancy, education (with indicators of average years of schooling and expected years of schooling), and standard of living as measured by income per capita. The HDI provides a more holistic picture of human well-being than relying solely on economic indicators such as GDP per capita. Studies have shown that a higher HDI is correlated with a better quality of life, including access to education, health services, and employment opportunities. The HDI also reflects a country's efforts to reduce social and economic inequalities. Although the HDI has improved in recent decades, disparities between regions and social groups, including gender, remain a major issue affecting the overall achievement of the HDI.

2.2 Poverty

Poverty is a state of inability of a person or group to meet basic life needs, such as food, clothing, and shelter, which has a negative impact on physical and mental well-being. Poverty not only affects economic conditions, but also on the quality of life, especially in the dimensions of health, education, and access to social services. [6]. Women's poverty, for example, is often more intensive and complex than men's poverty, due to gender discrimination factors that limit women's access to education, health, and decent work.

Poverty reduction through increased access to education and health services plays an important role in improving the overall HDI, especially for women and other marginalized groups. Women are more vulnerable to poverty due to various structural factors, such as limited access to education, employment, and gender roles that often place women in a weaker position in the economy. Women are often trapped in "double poverty" because gender inequality limits them from accessing resources that can improve their welfare [7]. Women's poverty is closely related to the low level of women's participation in formal education and the world of work. Therefore, efforts to improve the HDI must include policies that reduce gender gaps, such as increasing access to education for women and economic empowerment.

2.3 Life Expectancy (AHH)

A statistical indicator that shows the average number of years a person of a given age can expect to live, based on the mortality rate in a given population over a given period of time. Life expectancy is often used to describe the quality of health and well-being of a country or region. Life expectancy is also closely related to social, economic, and environmental factors. Education, income, nutrition, clean water, and sanitation are some of the determinants that affect life expectancy in a country.

Life expectancy is one of the main components of the Human Development Index (HDI) which is used to measure the progress of a country's development. Life expectancy reflects the extent to which a country or region is successful in providing adequate health services to its population [1]. Countries with higher life expectancy tend to have a better quality of life, which in turn has an impact on increasing the HDI. Increasing life expectancy indicates that people are not only able to live longer, but also have a better quality of life, with lower mortality rates, especially among children and women.

2.4 Human Capital

Human capital, which includes education, training, work experience, and other skills, greatly influences the unemployment rate in a country or region. The higher the human capital a person has, the more likely they are to get a job. Conversely, individuals with low human capital (e.g., lack of skills or formal education) tend to be more vulnerable to unemployment. In an effort to reduce unemployment, investment in human capital development is essential. Better education and training can improve the skills of the workforce and increase their competitiveness in the labor market. Technology can serve as a tool to improve the quality of human capital [8], [9]. The existence of technology encourages individuals to have more access to information, training, and learning that can enrich their skills. Technology can help reduce unemployment by providing greater opportunities for training and skills improvement, as well as creating new jobs. The development of technology has created new job opportunities in the technology sector, such as software development, cybersecurity, data analysis, and system design. Workers who have skills in these areas have the opportunity to get better and more profitable jobs. Human capital and technology support each other and play an important role in economic development, job creation, and productivity improvement. Skilled human capital enables the maximum use of technology, while technology provides the tools to accelerate skills development and create new job opportunities. With the right investment in education and training and efficient adoption of technology, we can create a society that is more competitive, innovative and ready to face the challenges of the future.

3. RESEARCH METHODS

This study uses a quantitative design with a multiple regression analysis approach to determine the effect of several independent variables on the dependent variable. Multiple regression was chosen because it allows researchers to analyze more than one factor that can influence a phenomenon simultaneously. In this study, the dependent variable used is the Human Development Index (HDI), while the independent variables tested include the number of women below the poverty line, the number of female population aged 7-23 years, and female life expectancy. The number of women below the poverty line is measured based on the percentage of women living below the poverty line in each province. The number of female population aged 7-23 years is measured based on the percentage of women in that age range in each province. Female life expectancy is measured by the average number of years expected to be lived by women in each province. The type of data used in this study is secondary data from the Central Statistics Agency (BPS). The multiple regression analysis model is used to analyze the relationship between independent and dependent variables.

The multiple regression equation used in this study is as follows:

$$HDI=\beta0+\beta1(\text{Female Poverty})+\beta2(\text{Female Population Aged 7-23})+\beta3(\text{Female Life Expectancy})+\epsilon$$

Where:

a. IPM = Human Development Index (dependent variable)
b. β0 = Intercept (constant)
c. β1,β2,β3 = Regression coefficients of independent variables
d. ϵ = Error term (measurement error)

This multiple regression analysis will measure how much influence each independent variable has on the dependent variable (HDI) and to determine the relationship between these variables simultaneously.

4. RESULTS AND DISCUSSION

Figure 1. Regression Analysis

Dependent Variable: Y
Method: Least Squares
Date: 12/25/24 Time: 09:49
Sample: 2018 2026
Included observations: 9

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-82.30945	16.51940	-4.982594	0.0025
X1	-0.428207	0.121242	-3.531848	0.0123
X2	2.122075	0.210211	10.09496	0.0001

R-squared	0.991727	Mean dependent var	68.92889
Adjusted R-squared	0.988969	S.D. dependent var	1.295477
S.E. of regression	0.136062	Akaike info criterion	-0.890212
Sum squared resid	0.111077	Schwarz criterion	-0.824470
Log likelihood	7.005952	Hannan-Quinn criter.	-1.032082
F-statistic	359.6154	Durbin-Watson stat	2.304146
Prob(F-statistic)	0.000001		

$$Y = -82.309 – 0.428X1 + 2.122X2 + e$$

Where:

Y = Female Human Development Index (Female HDI)
X1 = Social (measured by the percentage of women living below the poverty line)
X2 = Health (measured by female life expectancy)
E = Error term (measurement error)

Interpretation of Coefficients and Significance:

a. Intercept (C = -82.309): The constant value (intercept) of -82.309 indicates the value of the Female Human Development Index (HDI Perempuan) when both independent variables (X1 and X2) are 0. Although this value does not always have practical meaning (because it is impossible for the values of X1 and X2 to be equal to 0 in reality), technically, the intercept indicates the base or starting point of the model. The p-value for C (0.025) indicates that the intercept is significant at the 5% level (0.05), because the p-value <0.05. This means that there is statistical evidence to support the existence of the intercept in the model.
b. Coefficient of X1 (social, women below poverty line = -0.428): The coefficient for X1 (number of women below poverty line) is -0.428. This means that every 1 unit increase

in the percentage of women living below the poverty line will decrease the HDI for women by 0.428, assuming other variables remain constant. The p-value for X1 (0.0123) shows that X1 is significant at the 5% level (0.05), because the p-value <0.05. This means that there is strong evidence that the number of women below the poverty line has a significant effect on the HDI for women. Women's poverty does have a negative effect on their quality of life.

c. Coefficient of X2 (health, female life expectancy = 2.122): The coefficient for X2 (female life expectancy) is 2.122. This means that every one-year increase in female life expectancy will increase female HDI by 2.122, assuming other variables remain constant. The p-value for X2 (0.0001) shows that X2 is highly significant (p-value is much smaller than 0.05). This means that female life expectancy has a very strong and significant effect on female HDI.

d. Coefficient of Determination
The Adjusted R2 value = 0.988R^2 = 0.988R2 = 0.988 indicates that the regression model is very good at explaining the variability in the Female Human Development Index (HDI). Only 1.2% of the HDI variability cannot be explained by the model, indicating that this model is effective and has very good predictive ability and it can be concluded that the variables used in the model (female poverty and female life expectancy) have a very strong relationship with female HDI, and this model is reliable in analyzing factors that influence female human development.

Discussion

1. Female Human Development Index with Female Poverty

Based on the results of the regression analysis with a p-value = 0.0123 for X_1, we can conclude that the effect of poverty on women's HDI is significant at the 5% level, because the p-value <0.05. This means that poverty does have a statistical effect on women's human development. Every one unit increase in the percentage of women living below the poverty line will reduce women's HDI by 0.428. The poverty variable shows a significant negative relationship with women's HDI. The more women living below the poverty line, the lower the level of women's human development. This may be due to the lack of access to education, health, and economic opportunities for women living in poverty.

2. Female Human Development Index with Female Life Expectancy

Based on the results of the regression analysis with a p-value = 0.0001 for X_2, it shows that the effect of life expectancy on women's HDI is very significant, because the p-value is much smaller than 0.05. This shows that women's life expectancy has a very strong and significant contribution to increasing women's HDI. Every one-year increase in women's life expectancy will increase women's HDI by 2.122, assuming other variables remain constant. Higher life expectancy indicates better health conditions for women, which has a direct impact on improving their quality of life. The higher women's life expectancy, the higher women's HDI. Good health is closely related to greater opportunities to get an education, work, and participate in a more active socio-economic life.

CONCLUSION

Social Influence (Female Poverty): Variable X1 (number of women living below the poverty line) has a significant negative effect on female HDI. Every increase in the percentage of women living below the poverty line will reduce the female HDI. This shows that female poverty is a factor that hinders the improvement of quality of life and human development.

Health Influence (Female Life Expectancy): Variable X2 (female life expectancy) has a significant positive influence on female HDI. Every increase in female life expectancy will increase

female HDI. This shows that women's health, as reflected in life expectancy, has a significant influence on improving the quality of life and human development of women.

The results of this regression analysis show that female poverty and female life expectancy are two factors that have a significant influence on the Female Human Development Index. Female poverty has a negative impact, while higher life expectancy has a positive impact on the female HDI. Policies that focus on reducing poverty and improving women's health are needed to improve the quality of life of women in Indonesia and improve the overall Female Human Development Index.

Policies that need to be implemented to improve the Women's Human Development Index can be through economic empowerment programs such as skills training, access to microcredit, and decent work can help improve women's HDI. Further policies in terms of quality health services and programs to increase women's life expectancy will greatly influence improving the quality of life of women.

REFERENCES

[1] W. Widianningrum and R. A. Harahap, "Pengaruh GDP (Gross Domestic Product) dan Angka Harapan Hidup (AHH) terhadap IPM (Indeks Pembangunan Manusia) di Indonesia dan Brunei Darussalam," *Reslaj Relig. Educ. Soc. Laa Roiba J.*, vol. 6, no. 3, pp. 1940–1951, 2024.

[2] L. N. Aini and S. N. Islamy, "Dampak penganguran, pendidikan, kesehatan, PDRB dan indeks pembangunan manusia terhadap kemiskinan di Indonesia," *J. Econ. Res. Policy Stud.*, vol. 1, no. 3, pp. 132–141, 2021.

[3] E. K. Kiha, S. Seran, and H. T. Lau, "Pengaruh jumlah penduduk, pengangguran, dan kemiskinan terhadap indeks pembangunan manusia (ipm) di kabupaten belu," *J. Ekon. Sos. Hum.*, vol. 2, no. 07, pp. 60–84, 2021.

[4] N. Ramdhani, Y. Anggraeni, and D. Desmawan, "Analisis Pengaruh Indeks Pembangunan Manusia (IPM) Terhadap Kemiskinan di Provinsi DKI Jakarta," *J. Ekon. Bisnis Dan Manaj.*, vol. 1, no. 2, pp. 136–144, 2022.

[5] F. Y. Risdiana, "Analisis Pengaruh Jumlah Penduduk Perempuan Terhadap Indeks Pembangunan Manusia," *ENTITA J. Pendidik. Ilmu Pengetah. Sos. dan Ilmu-Ilmu Sos.*, vol. 2, no. 2, pp. 257–270, 2020.

[6] S. Santika, N. Hanum, S. Safuridar, and A. Asnidar, "Pengaruh Jumlah Penduduk, ANgka Harapan Hidup dan Rata-Rata Lama Sekolah terhadap Indeks Pembangunan Manusia di Kabupaten Aceh Tamiang," *Optim. J. Ekon. dan Manaj.*, vol. 2, no. 4, pp. 250–260, 2022.

[7] T. F. B. Simanjuntak, M. Zuhriadi, J. Habeahan, R. J. Lubis, T. P. U. Hutapea, and M. M. Sirait, "PENGARUH ANGKA HARAPAN HIDUP DAN KEMISKINAN TERHADAP INDEKS PEMBANGUNAN MANUSIA DI INDONESIA," *J. Intelek Dan Cendikiawan Nusant.*, vol. 1, no. 3, pp. 4012–4019, 2024.

[8] U. Giyono and M. Maemunah, "Perempuan Dalam Indeks Pembangunan Manusia (Kajian IPM-IPG Dan IDG Sumber Kemenpp Tahun 2019)," *J. Jendela Huk.*, vol. 8, no. 2, pp. 75–86, 2021.

[9] T. H. Utami and M. Arif, "Partisipasi Perempuan Dalam Pembangunan Manusia Berbasis Gender di Daerah Istimewa Yogyakarta," *Ganaya J. Ilmu Sos. Dan Hum.*, vol. 6, no. 3, pp. 622–630, 2023.