Reducing poverty strategy through educational participation, clean water, and sanitation in Indonesia

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A B S T R A K

A B S T R A C T
Addressing the poverty gap is the key to improving economic welfare and improving the structure of purchasing power in society. This paper wants to analyze how increased education participation, access to clean water, and sanitation water reduce poverty disparities. The data analyzed in this study covered 501 districts and cities throughout Indonesia in 2018. The methodology used was an econometric approach with multiple regression equation models with robustness provisions. The calculation results prove that the model has been robust and all variables selected have a significant effect on the degree of freedom of 5% for all districts and cities in Indonesia. This study suggests that education policy priorities, the availability of clean water and adequate distribution, and sanitation facilities are needed to reduce the poverty gap.

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INTRODUCTION

The problem of poverty and income inequality is an inseparable combination of macroeconomic issues. The more unequal the income, the higher the poverty gap in the macro-environment. The increased poverty gap shows more and more individuals meeting their needs under conditions below the poverty line. The problem of poverty has become interesting lately (Smeeding, 2005). Since the great depression of the 1930s, the focus has been on economic growth rather than poverty and economic stability. Since the world economic crisis occurred in 2008, the problem of poverty has become very interesting because poverty and income inequality conditions have triggered the beginning of a severe economic crisis in this modern era (Whelan et al., 2014). Poverty and income inequality have damaged the aggregate purchasing power of society. The quantity of goods and services that can be purchased becomes negligible, so the production of goods and services becomes less. As is the market system, supply must be the same as aggregate demand.

In contrast to the European Economic Region, economic development in developing countries is dualistic, giving birth to two opposing groups of conditions that still exist, namely the high-income and low-income groups. Especially in Indonesia, regimes for governance have improved policies to tackle poverty but did not decline significantly. The complex problem of poverty requires decisive actions related to the method and Indonesia’s conditional and geographical Nature (Smeeding, 2005). This demographic and social complexity helps determine the best solution policy. Public policies must be able to hit the people who need them most and can have a multiplier effect in a state system (Tilak, 2002; Tsui, 1996).

Fulfilling the community’s basic needs is one of the strategic ways to improve the community’s economy. Non-physical needs, namely education, are a non-physical investment that is important to improve human capabilities. Education has become the key to success in building human resources to become more skilled and master knowledge. The most basic need for humans is clean water for various activities (Chaudhuri & Roy, 2017; Komarulzaman et al., 2017). Basic water needs are for drinking, preparing food, bathing, washing, cleaning, and sanitizing need by people every life (Gleick, 2000; Hutton & Chase, 2017; Reese et al., 2019). The fulfillment of clean water has also made the economic development process smooth (Hannah et al., 2020). So, the need for education and fulfillment of clean water not only improves the community’s economic condition but also reduces the poverty gap (Cameron et al., 2021; Musoke et al., 2018).

Economically, the inability of individuals to generate income makes these individuals poor over the country (Helm et al., 2017; Kayser et al., 2019; Reddy et al., 2017; Yu et al., 2016). The causes of this high poverty gap include mastery of knowledge, ownership, and control of productive assets, market forces, and political & legal forces (Fuente et al., 2016; Schoen et al., 2017; Shrestha et al., 2017). Educational systems and knowledge mastery are essential both individually and in groups; knowledge is the basis for people to work more efficiently and productively.
and impacting to economic growth (Eichelberger et al., 2021; Gorham et al., 2017; Rajagukguk et al., 2020). Besides, science helps find new economic and technological resources in the production process (Clasen & Rosa, 2017). Ownership and control of productive assets significantly affect the poverty gap (Eichelberger et al., 2021); individuals who do not have and do not control productive assets or own and control unproductive assets will get low income or no income at all (Garn et al., 2018; Young et al., 2019). In decreasing poverty in this country, the economy in Indonesia is primarily supported by SMEs, such as family businesses, because they provide employment and contribute 57.8 percent of gross domestic product (Omotayo et al., 2021; Purba & Tan, 2018). Then, the market and political systems that are significantly formed affect the poverty gap (Hennessy & Bressler, 2016; Monstadt & Schramm, 2017). Market systems and forms make a difference in the behavior of economic agents in the ability to access income due to the availability of household water in this country (Brewis et al., 2019; Torlesse et al., 2016). The political and legal system creates regulations that regulate every economic agent carrying out its activities to be productive consequences (Daniel et al., 2018; Luh & Bartram, 2016); of course, the existence of regulations makes the difference between economic agents' access income (Herrera, 2019; Miller et al., 2020). Therefore, the regulatory and market system not only determines income for each economic agent but also determines revenue growth and equity in the community (Jepson et al., 2017; Nhamo et al., 2019).

The percentage of poor people in urban areas in September 2018 was 6.89 percent, decreasing to 6.69 percent in March 2019 (Central Bureau of Statistics, 2020; World Health Organization, 2020). The following is a graph of Indonesia's poverty rate development from 1998 to 2019.

![Poverty Rate Decreased in The Last 21 Years, Indonesia](image-url)
The poverty rate in Indonesia has tended to decline in the last 21 years. In 1998 the poverty rate reached 24.2% and fell to only single digits in 2019. It was recorded that the percentage of poor people in September 2019 was 9.22%. This figure decreased by 0.19% against March 2019 and 0.44% against September 2018. The Indonesian Central Statistics Agency (BPS) noted that the poor population until March 2019 was recorded at 9.41 percent of the total population of Indonesia, which decreased compared to the previous year by 9.82 percent (Central Bureau of Statistics, 2020).

Below is the following figured 2 Poverty Gap Index in 501 districts and cities in Indonesia in 2018, which were observed.

Based on Figure 1 above, from 501 regencies and cities in Indonesia, most of the poverty gap index for regencies and cities throughout Indonesia is in the range below 4.0. Therefore, a study was made to improve the income structure of most regencies and cities in the future. So, the Research Question in this study is the following: Will a good education reduce the number of poor people in Indonesia? This question is the main discussion in this research. That is the goal that attracted the authors' attention in this research to the attention of the relevant government agencies to solve it.

Researchers have investigated where studies on the poverty gap index, education participation, clean water, sanitation in Indonesia by using the cross-section data of 501 regencies and cities in 2018 have not been carried out and discussed carefully. Researchers are interested in discussing this topic because it is considered very important for the welfare and benefit of many people in a nation. This case has been proven by previous researchers as described below.

The impact of a high poverty gap results in a decrease in purchasing power both in total and followed by changes in the economic structure; the evidence supports the opinion of Fam & Sofoulis (2017); Kamau & Njiru (2018). Of course, the problematic poverty gap above will always bring recession in a periodic economic
cycle, the similar argumentation by Herrera (2019); Kindangen & Paruntu (2015); Tarabini (2010).

The Research Question, as stated above, will describe the dynamics of the poverty gap for contributing to and improving the community and the nation. This research examines the extent of participation in education and cleans water and sanitation availability to reduce the poverty gap in every district and city throughout Indonesia.

LITERATURE REVIEW AND HYPOTHESES

Market economics often cannot be pro-poor regarding income generation capabilities for poor groups. For this reason, the Government should have protected them because they are a vulnerable economic group that has appropriate access rights to economic resources (Kurniawati et al., 2018). High inequality is dangerous for the poor, impedes economic growth, and often delays economic policy reform. On the contrary, equity is good for the poor because it is suitable for growth. This logic makes us worry about inequality negatively impacting economic growth.

Stock transactions and stock prices are a benchmark for the number of rewards received by investors; the higher the stock price, the higher the economic growth. Furthermore, economic performance growth can be reflected in the shares traded in a country. Thus the attribute factors of stock market activities can contribute to economic growth in terms of the stock transaction being a vital role in economic growth (Kurniawati et al., 2018; Supramsono & Wandita, 2017).

Thus good education is the basis of the right strategy to reduce poverty; in this case, education plays a multi-purpose in the global agenda and introduces effective policies to address inequality (Setiawan, 2020). These policies should achieve new ideal goals for a current hierarchy of educational priorities as well as reliable leaders, at least putting secondary school completion at the forefront and support by strong leaders (Huda et al., 2020; Jones & Pratomo, 2016). It reduces the difference between the length of private and public schools, making severe commitments to improving public networks; they should take the conditions of the teacher, etc (Mas’ud et al., 2019; Papilaya et al., 2019). Poverty reduction is the basis of a nation's development; it has proven to be a necessity more than a vision to fight poverty due to lack of income (Kindangen & Paruntu, 2015). At the same time, those needs are outside the individualistic concept of poverty which is related to the lack of capacity or disability the high school learners' participation (Haris et al., 2018; Michie, 2017; Mukminin et al., 2017). The lack of income is an expression of poverty and inequality. Lack of capacity and ability can reflect the lack of opportunity in both social realism and education (Suharno et al., 2020). However, poverty is also associated with uneven power relations in social, economic, and political contexts (Retnawati et al., 2016; Tarabini, 2010).
The research results conducted by Gylfason & Zoega (2003) show that greater quantity and better quality of education financed by the public budget can encourage economic growth and significantly reduce the unequal distribution of income in 87 countries in the world. These countries show that, first, economic growth varies with income inequality in reverse; secondly, there are three different education measures that are intended to reflect input, outcomes, and education participation which are all related to income inequality; thirdly, economic growth varies with education measures directly (Purba et al., 2020).

In the advanced statistical calculation approach, seemingly uncorrelated regression shows that education and income inequality affect economic growth independently. Furthermore, education and economic disparities are closely correlated (Gylfason & Zoega, 2003). The results of Gylfason & Zoega (2003)'s research show a close relationship between education and the problem of the poverty gap in several countries. It appears that education increases economic growth not only by increasing and improving physical capital and social capital, namely by decreasing income inequality. The association which is inversely proportional between economic growth and income inequality can be very clearly done with educational programs. In this study, the education variable used was years of schooling at the junior high school level. Because this variable is the result of research that proves that year of schooling at the junior high school level has a tremendous impact on the growth of a country. Likewise, the role of Junior High School can reduce the poverty gap index effectively and efficiently. So, the beneficial impact of better education on both economic growth and social equality (Gylfason & Zoega, 2006). Then the research hypothesis is stated as follows:

**H1**: Education participation affects the poverty gap significantly.

Overall, humans need fresh water every day for three widespread uses, domestic use, namely drinking, washing, preparing food, hygiene, using agriculture to produce food, and industrial use (Chenoweth, 2008). The primary and central principle of water needs makes the fulfilment of water a basic right for every human being (Gleick, 2000). The basic needs of clean water for drinking must be met availability. Therefore economic principles must be applied more intensively and reliably for water use and management (Budiono & Purba, 2019; Purba & Budiono, 2019). Water supply and use systems must be flexible and efficient; however, they must still consider adequacy. Government and non-government organizations, individuals, independent organizations, and other users must be included in the clean water management decision. A sound water cycle management system will improve the health and hygiene environment.

An excellent clean water management system has improved the quality of water used for drinking water by allocating high-quality water dams to the drinking
water demand system (Lim et al., 2010). Better hygiene and health conditions in the community will undoubtedly reduce the costs of care and treatment so that the allocation of community income can be allocated to be saved in savings or allocations for more productive economic activities (Hannah et al., 2020). The integrated water supply cycle management system has reduced the environmental impact associated with electricity consumption for water distribution (Lim et al., 2010). A decrease in electricity consumption for moving water from one place to another result in lower costs so that the impact of less electricity supply will reduce pollution from the power station.

Furthermore, the cost of electricity consumption is making a significant efficient condition. In line with that, previous research states that to reduce the poverty gap, the quality of human life through education, clean water, and health is poverty alleviation is considered one of the right ways. Education and health have proven to be intangible and invisible assets that play an essential role in shaping skilled human resources (Budiono & Purba, 2019).

From a review of some of the results of these studies, the provision of clean water for domestic and sanitary needs will improve the health and hygiene of individuals and overall conditions. The reduction in costs resulted in an economic increase in the standard of living, further reducing the number of poor people met with clean water (Admasie & Debebe, 2016; Budiono & Purba, 2019). Then the research hypothesis is stated as follows:

**H2:** The availability of clean water affects the poverty gap significantly.

**H3:** The existence of sanitation affects the poverty gap significantly.

Poverty is defined as the individual living in a household with no more than US $1 per day per person which is valued at international prices. The poverty Gap Index (PGI) is an average measure of the expenditure gap of each poor population against the poverty line. The higher the index value, the higher the average population expenditure from the poverty line (Ziliak, 2005). The general PGI formula in this study is as follows:

\[ PGI = \alpha: the degree of aversion to poverty such that as \alpha increases, increasing weight is given to the poorest households 1. \\
\alpha \sum_{i=1}^{q} \left( \frac{y_i}{z} \right)^{\alpha} \]  

\[ \frac{y_i}{z} < 1 \]

α: the degree of aversion to poverty such that as α increases, increasing weight is given to the poorest households 1.

z: poverty line

q: the number of low-income families

y_i: average monthly expenditure per capita of the population below the poverty line, where the form of the mathematical equation is a person is poor if \( y_i < z \).

n: total population
As described above, poverty is a multidimensional concept in social life. Income is not sufficient to be a good enough indicator to measure poverty but is also supported by other sources such as energy and water availability (Armah et al., 2018; Hutton & Chase, 2016). To measure poverty, income may need to be supplemented with attributes such as health conditions attributes and education achievements (Gon et al., 2016). Multidimensional analogues with the growth and equity composition are solved (Tsui, 1996).

**METHODOLOGY**

**Basic Framework**

Next, the analysis tools used are the econometrics and statistical methods to test the model and their respective parameters (Greene, 2018). The unknown parameters of the stochastic relation \( y_i = x_i' \beta + \varepsilon_i \) are the objects of estimation. It is necessary to distinguish between population quantities, such as \( \beta \) and \( \varepsilon_i \), and sample estimates, denoted \( b \) and \( e_i \). The population regression is \( E[y_i|x_i] = x_i' \beta \), whereas authors estimate of \( E[y_i|x_i] \) denoted

\[
\hat{y}_i = x_i' \beta 
\]

The disturbance associated with the \( i \)-th data point is

\[
\varepsilon_i = y_i - x_i' \beta 
\]

For any value of \( b \), we shall estimate \( \varepsilon_i \) with the residual

\[
e_i = y_i - x_i' \beta 
\]

From the above definitions, so The basic framework for analysing cross section data is a regression model of the form (Greene, 2018)

\[
y_i = x_i' \beta + \varepsilon_i = x_i' \beta + e_i 
\]

This study uses crosssection data that includes 501 districts & cities in Indonesia Territory. The purpose of this study is to analyze the impact of Junior High School Enrolment (JHS_En), Household Water Access (HH_W), and Household Sanitation Access (HH_S) on Poverty Gap Index (PGI).

**Robust Least Squares Estimation**

In the generalized regression model, the disturbances may be heteroscedastic, autocorrelated, or both. The least-squares estimator is

\[
b = \beta + (X'X)^{-1} \sum_{i=1}^{n} X_i \varepsilon_i
\]
X is the independent variable matrix, and n is the number of observations.

We seek an estimator of \( \ast = \lim \left( \frac{1}{n} \right) \sum_{i=1}^{n} \sigma_{i}^{2} X_{i} X_{i}' \). Greene states in Sakata & White (2001); White (1980) shows that, under very general conditions, the estimator 
\[
S_{0} = \frac{1}{n} \sum_{i=1}^{n} e_{i}^{2} X_{i} X_{i}'
\]
has \( \lim S_{0} = Q^{\ast} \). The result is that White heteroscedasticity consistent estimator.

\[
\text{Est. Asy. Var}[b] = \frac{1}{n} \left( \frac{1}{n} X' X \right)^{-1} \left( \sum_{i=1}^{n} e_{i}^{2} X_{i} X_{i}' \right) \left( \frac{1}{n} X' X \right)^{-1} = n(X'X)^{-1}S_{0}(X'X)^{-1}
\]

The purpose of this study is to determine the extent to which the poverty gap is influenced by Junior High School Enrolment (JHS_En), Household Water Access (HH_W), and Household Sanitation Access (HH_S), so that the dependent variable is the Poverty Gap Index (PGI). The following explains the Junior High School Enrolment, Household Water Access, Household Sanitation Access, and Poverty Gap Index variables used in the economic model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>Description</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty</td>
<td>Poverty Gap Index</td>
<td>the average size of the expenditure gap of each poor population group against the poverty line</td>
<td>PGI</td>
</tr>
<tr>
<td>Education</td>
<td>Junior High School Enrolment</td>
<td>Years of schooling, the individual has received the education in junior high school</td>
<td>JHS_En</td>
</tr>
<tr>
<td>Clean Water</td>
<td>Household Water Access</td>
<td>Percentage of household access to drinking water, bathing, and cleaning</td>
<td>HH_W</td>
</tr>
<tr>
<td>Sanitation</td>
<td>Household Sanitation Access</td>
<td>Percentage of household access to sanitation water</td>
<td>HH_S</td>
</tr>
</tbody>
</table>


This study uses data that includes cross sections in 501 residences & municipalities in 2018 in the whole area of Indonesia. There are 514 districts and cities throughout Indonesia, but not all districts and cities can be analyzed. This happened because 13 regencies/cities did not have complete data, so they could not fulfill the statistical and econometric calculations (not available) used in this study.

**Empirical Model**

Based on the problems and possible causal relationships between Junior High School Enrolment \((JHS_{En})\), Household Water Access \((HH_{W})\), and Household Sanitation Access \((HH_{S})\) with Poverty Gap Index \((PGI)\), then the output of the compilation can be a research model \((Chang et al., 2015; Dumitrescu & Hurlin, 2012; Narayan et al., 2010)\).
There are a few arguments for this model which are similar (Cullen et al., 2012; Danish et al., 2019; Karanfil & Li, 2015; Popescu et al., 2018).

Through several econometric equations, namely equations 2, 3, 4, 5, and supported by the application of robust least squares, namely equations 6, 7, and 8, researchers can rearrange the studied model into reduced form in equation 9. Therefore, the basic framework for analyzing the data is a regression model of the formula derived from; Emran et al. (2015); Greene (2008, 2018).

\[ PGI_i = \text{constant} + \beta_1 JHS\_En_i + \beta_2 HH\_W_i + \beta_3 HH\_S_i + e_i \] ........................................... 9

Based on the theoretical estimates for each parameter to achieve the desired model conditions in mathematical equations are as follows.

\[ \beta_1 = \frac{\partial PGI}{\partial JHS\_En_i} < 0, \quad \beta_2 = \frac{\partial PGI}{\partial HH\_W_i} < 0, \quad \text{and} \quad \beta_3 = \frac{\partial PGI}{\partial HH\_S_i} < 0 \] ........................................... 10

Based on the calculus equation, the partial test of each independent variable is one way. Junior High School Enrolment (JHS\_En) affects the Poverty Gap Index in the reverse direction, Household Water Access (HH\_W) affects Poverty Gap Index (PGI) in the reverse direction, and Household Sanitation Access (HH\_S) affects the Poverty Gap Index (PGI) in the reverse direction. Thus, the value of each parameter \( \beta \) is expected to be negative.

While the partial testing of each independent variable on the dependent variable is carried out by t-test with a significance level in this study amounting to 5\%. Then, by using the null hypothesis (H_0) and alternative hypothesis (H_1) for partial testing on the \( \beta_1 \) parameter as follows:

H_0: \( \beta_1 = 0 \), the Junior High School Enrolment does not affect poverty.
H_1: \( \beta_1 < 0 \), the Junior High School Enrolment affects income Poverty negatively.

The null hypothesis (H_0) and the alternative hypothesis (H_1) for partial testing on the
\( \beta_2 \) parameter are as follows

- **H\( \text{\textsubscript{0}} \):** \( \beta_2 = 0 \), the Household Water Access does not affect poverty.
- **H\( \text{\textsubscript{1}} \):** \( \beta_2 < 0 \), the Household Water Access influences poverty negatively.

Last, the null hypothesis (H\( \text{\textsubscript{0}} \)) and the alternative hypothesis (H\( \text{\textsubscript{1}} \)) for partial testing on the \( \beta_2 \) parameter are as follows

- **H\( \text{\textsubscript{0}} \):** \( \beta_3 = 0 \), the Household Sanitation Access does not affect poverty.
- **H\( \text{\textsubscript{1}} \):** \( \beta_3 < 0 \), the Household Sanitation Access influences poverty negatively.

Thus, it is evident in practical econometrics that there are always outlier data which means the data do not follow general patterns. This problem becomes severe and complex. A model is considered robust if it meets the requirements of basic assumptions. A method for estimating parameters is needed to meet the best linear unbiased estimator (BLUE) in regression analysis. One popular method used is Ordinary Least Square (OLS).

The classic assumption that must be fulfilled in OLS so that the estimation results are robust is homoscedasticity. Violation of the assumption of homoscedasticity is called heteroscedasticity, which means that the error is not constant. The consequence of heteroscedasticity can result in the OLS estimator obtained still meeting the unbiased requirements, but the resulting variant becomes inefficient, which means the variant tends to enlarge so that it is no longer the smallest variant. Therefore, the best traits will not be fulfilled (Greene, 2018).

This assumption is very important in the regression analysis because it relates to the estimated standard error of the regression coefficient. Standard error regression has a role in the formation of t-counts, and F-counts will be overestimated, which may subsequently produce conclusions that appear to be significant but not significant. Therefore, if the assumption of homoscedasticity is not fulfilled, the t-test is uncertain (Greene, 2018).

As Greene (2018) suggests, the regression method is done by weighting the data with an appropriate multiplier factor. Using the Stata Software application version 15, the selected weighting is automatically the proper weighting so that robustness is met the requirements. The results of the t-test and F-test will show the actual value and are significant. Data analysis followed the ordinary least square (OLS) econometric model framework.

**DATA ANALYSIS & DISCUSSION**

**Classical Assumption Test: Multicollinearity Test and Heteroscedasticity.**

Multicollinearity testing can be done by calculating the variance inflation factors with the following results:
Based on the results of the Multicollinearity test in Table 2 that all the Variance Inflation Factors values are below 10, it can be concluded that there is no multicollinearity between the independent variables. Because the regression data processing uses robustness (robust cluster) techniques, the heteroscedasticity test is not appropriate; this follows the opinion of Greene (2018); White (1980). Thus, the data used in this study has met the requirements for further processing.

**Robustness Linear Regression Test**

Because there are more than 2 in the independent variable, robustness regression testing is needed to ensure that the coefficient is unbiased (Gujarati, 2012; Rousseeuw & Leroy, 1987). Based on the econometrics model chosen in this study, the calculation results of poverty gap analysis in districts and cities throughout Indonesia are listed in the following Table 3.

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Coefficient</th>
<th>Robust Standard Error</th>
<th>t-test</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>JHS_En</td>
<td>-0.040</td>
<td>0.012</td>
<td>-3.37</td>
<td>0.001</td>
</tr>
<tr>
<td>HH_W</td>
<td>-0.019</td>
<td>0.006</td>
<td>-3.16</td>
<td>0.002</td>
</tr>
<tr>
<td>HH_S</td>
<td>-0.029</td>
<td>0.008</td>
<td>-3.65</td>
<td>0.000</td>
</tr>
<tr>
<td>Constant</td>
<td>8.110</td>
<td>0.872</td>
<td>9.29</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Source: Data processing (2020)

The results of this study indicate that partially all variables are significant. There is no guarantee that a high r-squared is a good econometric equation, as well as a low r-squared value, does not always indicate a bad equation (Greene, 2018). Based on the table, the results of the analysis above can be summarized in the following equation:

\[ PGI_t = 8.11 - 0.040 \times JHS\_En_t - 0.019 \times HH\_W_t - 0.029 \times HH\_S_t \]

Regarding the results, the F-test with a figure of the probability of 0.000 states that all independent variables together affect the Poverty Gap Index non-independent
variable in this econometrics model. All coefficient parameters displayed in table 2 show -0.04, -0.19, and -0.029. Those coefficient values are negative, which means that all independent variables affect in the opposite direction are significant with the t-test results of variables: -3.37, -3.16, and -3.65, and all probabilities are at a value of below 0.05.

Every year, increasing 1 unit of variable education participation for the Junior High School level will significantly reduce the Poverty Gap Index by 0.04 at the district and city levels throughout Indonesia. The findings demonstrate that education participation at the junior high school (SMP) level greatly determines national economic growth, thus reducing Poverty (PGI) by 0.04 for students. The effect of assessing clean water for each unit will reduce the poverty gap index for every accessing household member. Furthermore, the availability of clean water in the household will significantly decrease the poverty gap index by a value of 0.019 at the district and city levels throughout the country. So, it is clear that clean water in households has significantly reduced the poverty gap index. Researchers worldwide have proved that clean water is very influential in increasing economic growth at the district and national levels.

Although most people underestimate the existence of sanitation in both rural and urban communities, this research proves that sanitation is very decisive in reducing poverty. Lastly, the poverty gap index figure for each unit accessing household sanitation is 0.029 for all the district and city levels throughout Indonesia. This is caused by a clean and healthy environment that can contribute to the community's health to be more productive.

Influence on poverty reduction. In line with Syaifullah & Malik (2017), the human development index (HDI) and gross domestic product (GDP) have an effect on poverty levels in Southeast Asian countries. Our research results are also in line with the findings from (Kindangen & Paruntu, 2015). Their conclusion is that household income increases, poverty reduces. It means that entrepreneurship has positive. In a macroeconomic view, increased income of households causes increased economic growth. So, economic growth reduces poverty, and entrepreneurship has a positive influence on economic growth as well as poverty reduction.

However proposed strategy, as the significant improvements to secondary education (Junior High School), access to clean water, and sanitation can be achieved by directly impacting poverty reduction; thus, the poverty gap can be narrowed. This is already proven in several countries that have succeeded in improving the quality of life or reducing the poverty gap by increasing access to the three variables above. Furthermore, given the significant influence of the three variables on reducing the poverty gap, the results of this proof can be used by Joko Widodo's government/regime as one of the strategies to develop the nation in next future.
CONCLUSION, IMPLICATION, AND SUGGESTION

The results of the analysis of this study proved that the role of education and access to clean water significantly reduces poverty disparities. The higher individual participation in taking education with good quality will improve the individual's condition from poverty, both overall standard of living and structurally equality. The more increased access to clean water for domestic activities will reduce the poverty gap index and automatically increase living standards significantly.

Clean water can be obtained cheaply so that people's income can be allocated to other needs more precisely, which automatically increases purchasing power for those needs. Thus, clean water for domestic needs provided by the Government has a dual role: reducing inequality and improving welfare. Identical to clean water for domestic activities, the Poverty Gap Index can be reduced by achieving the people on water sanitation needs. The higher the availability of clean waters for sanitation and the lower the gap between the populations. The availability of sanitation water will improve the quality of the environment and health so that the cost of health care can drop significantly; ultimately, the welfare of people is higher. According to the findings of the discussion above, it is clear that secondary education (Junior High School) availability of access to clean water and good sanitation has been proven to reduce the poverty gap in Indonesia. However, we recommend that further research be carried out related to other related variables.

Thus, the sanitation development target in Indonesia must be a priority to align the 2015–2019 RPJMN (National Medium-Term Development Plan) and 2020–2024 RPJMN with the 2030 SDGs target to be in line with the Jokowi Government's program in building good human resources.

This study only discusses the variables of junior high school level education, household access to water and sanitation, and poverty. The objects of this study are limited geographically by oceans and islands throughout the territory of Indonesia. They have widely spread the regency with cross-section data from BPS in 2018. Using the panel data for future research in broadening perspectives is suggested.

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