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Inclusive Human Development and Inclusive Green Growth: A Simultaneous Approach

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ABSTRACT

This research analyzes the effect of inclusive green growth and inclusive human development in Indonesia simultaneously. The research time period is from 2011-2019 in 34 provinces in Indonesia. The simultaneous equation method is used to answer the hypotheses that are built. These findings show that inclusive green growth is influenced by inclusive human development, regional financial performance and industrialization. In addition, inclusive human development in Indonesia is influenced by inclusive green growth and democracy. Natural disasters have no effect on inclusive human development. These results provide suggestions for equitable distribution of human development, improvement of regional financial performance, deindustrialization and improvement of democracy.

1. INTRODUCTION

The focus of the problem in this research is inclusive green growth and inclusive human development as explained in the sustainable development goals. This is based on the world's Sustainable Development Agenda in 2030 to achieve equality in gender development and environmentally inclusive development.

The world's Sustainable Development Agenda is expected to be achieved by 2030 includes equality in gender development. In the development, gender development issues are the development of human development issues introduced by United Nations Development Programme (UNDP) since 1990. The Human Develoment Index (HDI) is an indicator used by UNDP to see the development of human development in each country. This HDI is a response to the world's dissatisfaction with Gross Domestic Product (GDP) per capita to describe the level of welfare of the people in a country [1]. However, the dynamics of life that continue to develop issues of equality and justice between men and women in obtaining education, health and income are goals that must be realized by every country. For this reason, the concept of Human Development (HD) was developed into Inclusive HD (IHD) [2], which observes that equality in human develoment must be achieved to eliminate inequality in the achievements of men and women, thus the concept of IHD pays attention to inequality in human development. Inclusive human development is carried out, thus every individual has the right to health and education and the ability to increase consumption as a basic need.

In Indonesia, to express human development based on equality, the Gender Development Index (GDI) is used. GDI is the answer to the inequality of achievement of men and women, whose measurement is the same as the HDI, but implicitly reveals injustice [3]. Justice is increasingly achieved when the GDI is close to 100. Thus, the Inclusive HDI (IHDI) data in Indonesia is described by the GDI data which can be seen in Figure 1.

Figure 1 explained that IHDI of Indonesia during the 2011-2019 period. In aggregate, it has increased every year starting from the initial period of 88.40 to the final period of 90.37. In aggregate, it means that human development in Indonesia is getting closer to equal distribution between men and women every year at a slow rate.

The next agenda that must be achieved is inclusive and sustainable economic growth. This is an answer to the past concept of economic development which only prioritized the process of increasing national income, but often left problems such as poverty, inequality and unemployment, thus this economic development has not been fully enjoyed by everyone. Therefore, economic growth must prioritize quality economic growth [4].

Furthermore, the concept of inclusive growth has developed along with environmental issues that must be considered in achieving economic growth. The studies had developed an inclusive green growth (IGG) concept which is the answer to inclusive growth that takes environmental issues into account [5-7]. The concept of IGG are green growth (GG) inclusive growth (IG).

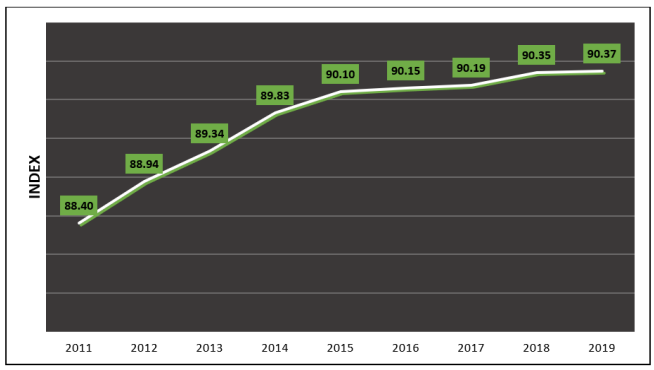

Figure 1. Inclusive Human Development Index (IHDI) of Indonesia from 2011-2019 [3]

Meanwhile, thecombined three concepts show inclusive green growth namely the economic concept (economic growth), the social concept (labor, poverty and inequality) and the environmental concept (consisting of air emissions and environmental pollution) [6]. The environmental concept stated the concept of inclusive green growth as a composite part of the variables of inclusive growth (which includes economic progress, poor condition, disparity and employment) and environmental quality (which consists of water level, air level and forest level) [7].

Indonesia also implements the sketch of sustainable growth to confirm a raise in production output while maintaining environmental sustainability. To describe the incidence of IGG in Indonesia, it is seen from the composite of the inclusive growth index and the environmental quality index. The results are shown in Figure 2 for the period of 2011-2019.

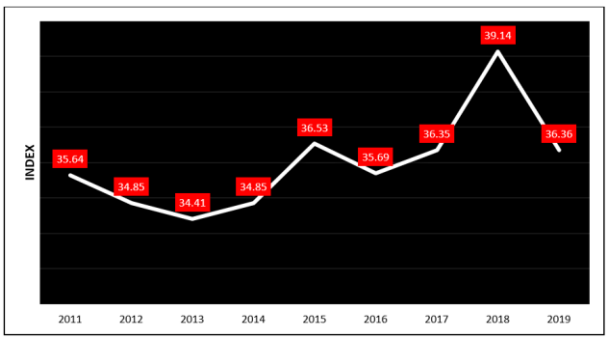

Figure 2. Information on indonesia's index inclusive green growth [3]

Based on Figure 2, it can be seen that in aggregate, the phenomenon of green growth index (GGI) occurred in Indonesia has fluctuated, and was always in the unsatisfactory category based on the criteria set by Indonesian Ministry of National Development Planning. This illustrated that the growth carried out in Indonesia had not achieved all levels of society and was not environmentally friendly.

This condition illustrates that Indonesia faces challenges in realizing the Sustainable Development Goals (SDGs) agenda, especially on equitable distribution of human development and inclusive and environmentally friendly growth. The research [3] explained the development of a healthy life and quality education and followed by an inclusive social life through empowering individuals to obtain justice and equality will provide impetus for inclusive growth and improvement of environmental quality.

The objective of this study was to develop previous research carried out [7]. Previous research has showed that IGG was directly affected by IHD. From other previous studies, conventional economic growth showed a significant positive relationship to human development [8, 9]. Therefore, the authors predicted that the IGG will show a significant effect on IHD. This research has been conducted in West Sumatera, Indonesia, in 2021 and 2022.

2. LITERATURE REVIEW

2.1 Inclusive Green Growth (IGG)

Inclusive and environmentally friendly green growth is an important way to achieve sustainable development. The concept of IGG is an organic combination of two development concepts, namely Green Growth (GG) and Inclusive Growth (IG) [5]. Sun stated that green inclusive growth in China can be stated as a function of the economy (which refers to economic growth), social (which refers to social equity, poverty and employment), and energy and environment (which refers to reducing emissions) [6]. Juniardi inclusive green growth in Indonesia is a composite variable consisting of inclusive growth variables (economic growth, poverty, inequality and employment) and environmental quality (water quality, air quality and forest cover area [7].

In the perspective above, inclusive green growth in this study is explained in the operational definitions of the variables in this study. The value of inclusive growth and green growth is very satisfying when it is close to 100.

To achieve inclusive green growth, many factors influence it, namely the variables forming human development such as education and health have a significant positive effect on inclusive green growth [7, 10-12]. Furthermore, regional financial performance also has a significant positive influence on the variables forming inclusive green growth [7, 13]. Industrialization has an influence on the variables forming inclusive green growth, namely for economic growth [13], but industrialization has a significant negative effect on water, air or environmental quality [7, 10].

From the findings of the researchers above, it appears that inclusive green growth is a function of inclusive human development, regional financial performance and industrialization. Thus the form of the equation is formed:

$$\mathbf{Y_{1it} = \beta_0 + \beta_1 Y_{2it} + \beta_2 X_{1it} + \beta_3 X_{2it} + \mu_1} \quad (1)$$

where,
Y_1 = Inclusive Green Growth
Y_2 = Inclusive Human Development
X_1 = Regional Financial Performance
X_2 = Industrialization.

2.2 Inclusive human development

The role of human development is important for increasing the ability of a developing country to absorb modern technology and capacity building for the realization of sustainable growth and development [2]. UNDP UNDP explained that the assessment of human capabilities is determined through the Human Development Index (HDI). HDI is understood by combining health, education and income into a composite index [10].

However, over time, especially in the implementation of sustainable development goals within the framework of the SDGs, the use of HDI does not pay attention to the equality of human development between men and women as people who are often forgotten. The proportion of education, health and purchasing power in general is still dominated by men in large numbers compared to women.

Equality in human development must be achieved to eliminate this injustice, so that the concept of inclusive human development by taking into account inequality in human development needs to be developed [2, 7]. In the SDGs agenda, equality is an agenda that must be realized. In order to reveal the inequity in the achievement of men and women, the Gender Development Index (GDI) is used, which measures the achievement of the dimensions and variables the same as the HDI, but reveals injustice [3]. Empirical evidence shows that

educational discrimination against women not only hinders economic growth but also widens social inequality. Education that women have also plays an important role in improving family nutrition [2].

In this research, the authors are guided by the concept of human development, namely human development which pays attention to equality between men's development and women's development (in the framework of gender development which is a composite index) which is expressed in the Gender Development Index (GDI). Meanwhile, the purpose of inclusive human development in this study is as explained in the operational definitions of research variables. Justice is increasingly achieved when the GDI value is close to 100.

To achieve inclusive human development, many factors influence it, namely the variables forming inclusive green growth affect inclusive human development. Economic growth shows a significant positive relationship to human development [8, 9]. Environmental pollution or energy emissions have a significant negative relationship to human development [14-15]. In addition, natural disasters in an area have a significant negative effect on health as described in previous studies [12, 16]. And in the end, the quality of democracy in a region has a significant positive influence on the growth of human development in that region, as explained in previous research [17, 18].

From the explanations of previous researchers, inclusive human development is a function of inclusive green growth, natural disasters and democracy. Thus, the form of the equation is formed:

$$\mathbf{Y_{2it} = \beta_4 + \beta_5 Y_{1it} + \beta_6 X_{3it} + \beta_7 X_{4it} + \mu_2} \quad (2)$$

where,
Y_1 = Inclusive Human Development
Y_2 = Inclusive Green Growth
X_3 = Natural Disaster
X_4 = Democracy.

3. MATERIAL AND METHODOLOGY

3.1 Research method

This research uses a quantitative descriptive method. This descriptive method is used to investigate the value of a variable independently, either one or more variables, without create comparisons or linking between variables [19].

3.2 Research types and variables

The data used in this research is secondary data published by the Government of Indonesia, namely the Indonesian Central Statistics Agency, the Ministry of Forestry and Environment, National Planning Agency, and the National Disaster Management Agency. The focus of the research is 34 provinces in Indonesia during the period 2011-2019. The endogenous variables are inclusive green growth and inclusive human development. While exogenous variables include regional independence, industrialization, democracy, and natural disasters.

3.3 Variable operational definition

To clarify the definitions, measurements, and units of the variables in this study, they can be seen in Table 1.

Table 1. Variable operational definition

Variable	Operational definition	Measurement	Unit
Inclusive Green Growth (Y_1)	growth followed by the economy by descent number poverty , numbers unemployment and number inequality as well as happening enhancement quality environment life	$\frac{IGI + EQI}{2}$	Index
Inclusive Human Development (Y_2)	development adapted human _ with gender equality	Gender Development Index	Index
Performance Regional Finance (X_1)	Ability finance area in use budget	average of results distribution Solvability Budget , Independence Finance and Solvability Service	Index
Industrialization (X_2)	Enhancement activity production sector industry	sector GDP industry	Billion rupiahs
Natural Disasters(X_3)	Incident natural disaster	Amount overall incident disaster natural	Time
Democracy (X_4)	development to freedom civil, rights political and institution	Index democracy	Index

3.4 Model specification

The variables mentioned above have a relationship as described in Figure 3.

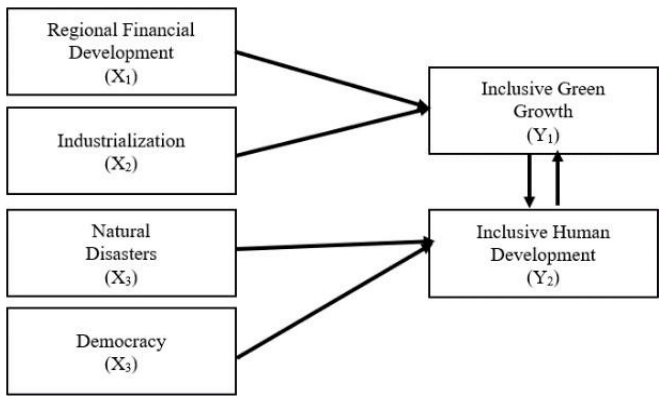

Figure 3. Conceptual framework

Based on Figure 3, by using the econometric approach, the mathematical equations for the above simultaneous equations can be written as follows:

First, the basic model for an inclusive green growth equation

$$Y_{1it} = \beta_0 + \beta_1 Y_{2it} + \beta_2 X_{1it} + \beta_3 X_{2it} + \mu_{it} \quad (3)$$

Second, the basic model for inclusive human development equality

$$Y_{2it} = \beta_4 + \beta_5 Y_{1it} + \beta_6 X_{3it} + \beta_7 X_{4it} + \mu_{it} \quad (4)$$

3.5 Simultaneous analysis techniques

3.5.1 Granger causality test

This research uses the Granger causality test. In terms of looking at the relationship between endogenous variables in a research model, the Granger causality test can be used. If the test results show a probability value less than = 0.05 (t-statistic is greater than t-table) then Ho is rejected or Ha is accepted. Thus, Y_1 affects Y_2. On the other hand, the same method can also be used to see if Y_2 has an effect on Y_1.

3.5.2 Identification test

This research uses a model that considers a two-way relationship as well as an indirect relationship between one variable and another. This happens if in one case the Y variable is influenced by the X variable, and in the other case the X variable is influenced by the Y variable. The analysis used is a simultaneous equation, which first performs an identification test. The results of the order conditions in this study are stated as follows:

Equation 3: K-k = 4-2 > m-1 = 2-1 → 2 > 1 (overidentified)

Equation 4: K-k = 4-2 > m-1 = 2-1 → 2 > 1 (overidentified)

From the results of the identification test using the order condition for the two equations, it can be concluded that all existing equations were overidentified. Thus, the Two Stages Least Squared (TSLS) method was used to estimate the parameters of the existing equations. The estimation of the coefficients will still be unbiased due to the advantage of the TSLS method.

4. RESULTS AND DISCUSSIONS

Before estimating the endogenous variables, the Granger Causality test is first carried out. Table 2 shows the probability value of each variable from the results of the Granger Causality Test. Here there is a two-way relationship or mutual influence between the variables of inclusive green economic growth (Y_1) and inclusive human development (Y_2). This is because the respective probability values are 0.0171 and 0.0236 or less than 0.05.

Table 2. Granger causality tests results

Null Hypothesis:	Obs	F-Statistics	Prob.
Y2 did not Granger Cause Y1	231	3.84962	0.0171
Y1 did not Granger Cause Y2		3.57959	0.0236

Source: Estimated Results, 2022

The estimation results of the IGG equation are shown in the following equation:

$$Y_1 = 34{,}72581 + 0{,}875436Y_2^{**} + 0{,}049131X_1^{**} - 0{,}020257X_2^{**} \quad (5)$$

$$R^2 = 0.633127$$
$$\text{Probability F} = 0.000000$$

Eq. (5) states that partially inclusive human development and regional financial performance affect inclusive green growth positively and significantly. Meanwhile, industrialization has a significant negative effect on inclusive green growth. Simultaneously inclusive human development, regional financial performance, and industrialization affect inclusive green growth in a significant positive way, because it has a probability value of f-statistic (0.000000) less than 0.05.

The estimation results of the IHD equation are shown in the following equation:

$$Y_2 = 93.61646 + 0.375086Y_1 - 0.025296X_3 + 0.146580X_4 \quad (6)$$

$$R^2 = 0.622973$$
$$\text{Probability F} = 0.000000$$

Based on Eq. (6), it can be seen that partially inclusive green growth and democracy have a significant positive influence on inclusive human development. Meanwhile, natural disasters have no significant effect on inclusive human development. Simultaneously, inclusive green growth, natural disasters and democracy have a significant positive effect on inclusive human development, due to the f-statistical probability value (0.000000) which is smaller than 0.05.

Partially, the results of the analysis above can be seen, Inclusive Human Development (IHD) affects Inclusive Green Growth (IGG) in Indonesia positively and significantly This is because education and health as a composite part of gender development provided knowledge and strength to every human being, both male and female, thus this knowledge and power can be utilized to carry out and increase the production of environmentally friendly goods and services. The knowledge possessed by an individual will give birth to new methods and innovations to produce output of goods and services without damaging the environment to realize sustainable growth. This phenomenon is in accordance with the explanation in the theory of endogenous growth pioneered by [20, 21], The theory explains that the main key to increasing economic productivity is human resources. The desire to learn and share knowledge by humans encourages the transfer of knowledge to share knowledge and skills as well as new things in the economy, thus, it can be a driving force in increasing economic productivity and new discoveries that can be used as the main source for increasing economic productivity [22]. The concept of human development also stated that the role of education is important to increase the ability of a developing country to absorb modern technology and develop capacity for the realization of sustainable growth and development [23]. The results of this research are identical to the results of research that has been done previously, namely human development contributes to encouraging future economic growth that can continue to grow and lead to equitable achievement or inclusiveness [10-12].

Furthermore, partially IGG in Indonesia is positively and significantly influenced by local financial performance by local governments. If it is effective in managing regional finances, then IGG can be maximized. This is because effective government spending for development must be able to touch the layers of society and open people's access to jobs that provide opportunities to earn income so that people can

get rid of the cycle of poverty and also eliminate income inequality in the community. In addition, regional financial allocations for environmental preservation and better environmental management efforts can protect the environment from any damage. This is relevant to Keynes's Classical Theory and Rostow and Musgrave's Theory of Government Expenditure. Keynes's Classical Theory mentions government intervention in the economy, one of which is through fiscal policy in the form of government spending, can determine optimal economic development. In addition, Rostow and Musgrave's Theory of Government Expenditure, mentions that government spending continues to grow based on the stages of economic development, namely in the early, intermediate, and advanced stages [23]. In the early stages of economic development, the percentage of investment made by the government must be greater than the total value of the investment. This is because the government must provide facilities and services such as education, health, transportation in the initial conditions before carrying out development in the next stage [22]. The results of this research are also identical with the results of previous research, namely that good financial management by the government will encourage regional progress towards being better economically, effectively and efficiently, thus, it also has an impact on equitable economic growth, which can be enjoyed by the community so that they can control the use of money. natural resources available in the environment [13, 24].

Then, partially, IGG in Indonesia is negatively and significantly affected by industrialization. If the industrial sector continues to grow in Indonesia, IGG cannot develop. Industrial growth will indeed increase economic growth, expand opportunities and access to jobs so that people can earn income that can keep people from the cycle of poverty and reduce income inequality, but industrial growth can trigger environmental degradation. On the other hand, if the growth of the industrial sector decreased, inclusive green growth will increase. This is because negative industrial growth will be followed by delays in the opening of new job opportunities for people who have the potential to become workers, so that people will lose the opportunity to earn income and only certain people will earn income resulting in income inequality which in the end many people are trapped in poverty. The results of this research further confirm the Environmental Kuznets Curve (EKC) hypothesis, namely in the early stages, economic growth causes high emissions that cause environmental damage, but at a later stage, economic growth achieved by using more advanced technology can reduce environmental damage and is also followed by a change from the industrial sector to the service sector [23]. The shift in the economic structure from agriculture to industry or in the industrialization process, in the early stages followed by environmental damage, as a result of the behavior and needs of the community in the use of natural resources to improve their standard of living without considering the impact on sustainability in the future, thereby increasing emissions. quickly because for some people are more concerned with work and income than clean air and water. Another Kuznet curve explains that there is a relationship between economic growth and income inequality in the form of an "inverted U-shaped" curve, namely the growth process through the development of the industrial sector which initially results in an increase in income inequality among households, then reaches a certain level of average income and finally starting to decline [23]. Thus, it is clear that the growth of the industrial sector will have an impact on decreasing environmental quality and increasing income inequality, decreasing the unemployment rate and followed by a decrease in poverty, or in other words, the growth of the industrial sector will reduce inclusive green growth in the early stages of the industrial process. This research is not in line with previous research, namely if the industry increases it will increase economic growth. In other words, industrialization with economic growth has a positive and significant relationship [7, 25]. This is due to industrial growth to achieve a high level of economic growth but not environmentally friendly will result in increased emissions which have an impact on air pollution, causing a decrease in water quality and opening new land in the traditional way through burning, thus industrial growth had an impact on the deterioration of environmental quality as a result of environmental degradation produced by the industrial process.

Partially the results of the study explain that IGG has a positive and significant effect on IHD in Indonesia. If IGG increases, it will encourage an increase in IHD. This is due to an increase in production results from economic growth that can create jobs for the community and have the opportunity to provide wages for people who work. Sufficient wages can get people out of poverty and encourage purchasing power to meet basic needs, fulfill food nutrition and improve environmental quality which contributes to supporting the health of both men and women, as well as financing education for men and women and ultimately improving the quality of human development evenly distributed. This research is identical to the welfare function as explained by Todaro that welfare is a function of income, inequality and poverty or W = f (Y,I,P), where Y is per capita income, I is inequality and P is absolute poverty. Based on this function, it is explained that social welfare is positively related to per capita income, but negatively related to inequality and absolute poverty [23]. In this research, income, poverty and inequality are composite variables of the IGG. The results of this research were also relevant to previous studies, namely the variables forming the composite of inclusive green growth affect human development including increase in carbondioxide (CO_2) emissions and environmental pollution which illustrates a decrease in environmental quality had a negative impact on human development [15] and there was also a significant positive relationship between inclusive growth and human development [8, 9].

And then partially, natural disasters have no significant effect on inclusive human development in Indonesia. This means that an increase or decrease in the incidence of natural disasters does not have a significant impact on increasing or decreasing inclusive human development, that is, it does not significantly affect educational conditions, health conditions and people's purchasing power. The results of this study are irrelevant to previous research, namely that large disasters that occur in the long term can affect human development, especially the mental health of the community [16]. In general, shocks that occur in nature have a significant impact on losses and decrease in human development and poverty indicators [26]. In addition, earthquakes also affect the educational outcomes of children in rural areas and can contribute to lowering the quality of human resources in developing countries [27]. In the long term, children from high socio-economic groups can reduce the negative impact of environmental disasters. However, it is difficult for children who belong to a lower socio-economic group to reduce the

impact of environmental disasters, especially to finish junior high school, so they are less likely to finish senior high school. Earthquakes cause changes in livelihoods to restore human well-being [28]. Most people have received a negative impact on changes in livelihoods so that the recovery of human welfare after the earthquake is difficult to realize, because humans need new skills to work in these new sectors.

Based on previous findings, it can be concluded that natural disasters affect human development, especially in people who are at a low level of welfare. Meanwhile, the results of this study state that natural disasters have no significant effect on IHD in Indonesia. This irrelevant result, in the opinion of the authors, is that natural disasters affect IHD indirectly. This is caused by natural disasters that occur, causing the greatest damage to natural resources as raw materials for production, thus hampering the rate of production and can have an impact on reducing income for humans. In addition, damage to natural resources as basic human needs such as water and forest damage can have a negative impact on human health. Thus, natural disasters will affect natural resources (environment) first before affecting IHD. Adam Smith's classical economic growth theory states that economic growth can be achieved by increasing total output growth. Factors increasing the growth of total output is the availability of natural resources in addition to human resources and capital stock. Natural resources available in the environment are a limiting factor, if all these natural resources have been fully utilized, output growth will stop. Therefore, the increasing incidence of natural disasters has an impact on increasing environmental damage so that it can hamper the rate of output growth, and ultimately lead to an increase in unemployment, an increase in poverty and income inequality [23].

The next variable that affects partially inclusive human development in Indonesia was democracy. If the quality of democracy increases, it will encourage the improvement of inclusive human development in Indonesia. This is because the implementation of democracy has increasingly opened the participation of all members of the community to get involved in the agenda of stages of human development programs such as education programs, health programs and community economic strengthening programs. Improving the quality of democracy will trigger an increase in freedom, because every community is given the freedom to determine their own destiny, then trigger an increase in equality to get fair treatment for every community and trigger a strengthening of power control to ensure the ability of people to defend their rights [17]. This means that if this increase in freedom is given to the community, the community has the right to make choices about quality education, health services that support better conditions and choices of employment opportunities to increase their purchasing power in accordance with the conditions experienced. Likewise, increasing equality will encourage people to have equal opportunities to choose quality education, better health services and employment opportunities that are in accordance with their respective conditions. When supervision is also carried out by the community, the community has the opportunity to ensure that they get the opportunity and make a choice in their destiny for quality education. better health services and job opportunities to increase their purchasing power. Thus democracy provides people with opportunities to improve their education, health and purchasing power to lead to inclusive human development. This phenomenon further emphasizes Sens' Theory, namely a consolidated democratic political system will expand the space to increase people's abilities. Democracy can be considered as the last step in the political process that allows the participation of different social classes between government and society. In addition, democracy will encourage the improvement of people's welfare [18]. The IHD index in this study was the development of the HDI published by UNDP. In addition, this phenomenon was relevant to Participation Theory. Thus, if democracy is improved, then every community can make better life decisions to improve quality education, better health and increase the ability to meet the needs of their families without being dependent on other parties. This finding was also relevant to previous research which stated that democracy contributes to the improvement of human development [18], democracy increased educational participation and the length of time for the community to attend school [29]. Democracy enhanced human development at every level of economic growth in developed countries but the effect will be maximal when economic growth is at its highest [30] and democracy can improve social welfare, using infant mortality as a core measure of human development [31].

5. CONCLUSIONS

IHD, regional financial performance and industrialization significantly affect IGG in Indonesia. Meanwhile , partially IHD and regional financial performance of IGG in Indonesia are positively and significantly affected. Then, the industrialization of IGG in Indonesia is negatively and significantly affected.

IGG, natural disasters and democracy have a significant impact on IHD in Indonesia. Partially, IGG and democracy have a significant positive effect on IHD in Indonesia. However, natural disasters have no significant effect on IHD in Indonesia. Meanwhile, to increase the distribution of human development, it is suggested that the government should improve the performance of inclusive green growth and democracy.

To increase IGG in Indonesia, it is suggested that the government should increase the distribution of human development and regional financial performance and reduce industrialization. Improving human development equity programs to ensure that people have access to education and health, including by organizing activities to send young teachers (graduates of education) to teach in underdeveloped and remote areas as well as health workers, such as increasing the number of village midwives to bring health services closer to society. Government spending is also encouraged to synergize with investment plans made by the private sector to provide a stimulus for the private sector to invest in their areas, such as building basic infrastructure in areas that have investment opportunities and potential, making it easier for the private sector to accelerate investment in the intended areas. This increase in investment will have an impact on the creation of new jobs for the local community. Stabilization function through the issuance and implementation of regulations to guarantee economic stability such as licensing regulations that support ease of doing business and provide tax holidays (tax incentives) for businesses that are just growing and developing to ensure that people can continue to produce in order to increase output to obtain increased income and absorb labor employment through the creation of new jobs. However, regulations on the ease of doing business and tax holidays (tax incentives) must be followed by setting thresholds for water

pollution and air pollution to ensure environmental sustainability and efficient production for the community as business actors and a healthy environment for the whole community.

The limitation of this study lies in the use of a few exogenous variables. That is, only 4 exogenous variables with 2 exogenous variables for each of the endogenous variables. In the future, this research can be developed using the Panel Vector Autoregressive/Panel Vector Error Correction Model method to see how a variable responds to shock from other variables. For example, if industrialization is increasing rapidly, does the inclusion of green growth respond at the beginning of the period by increasing or decreasing.

For further research, it is recommended to make other variables of Sustainable Development a determinant of IGG and IHD variables, namely variables that are proven to affect economic growth and the environment are thought to affect IGG, such as taxes, investment, exports and others. Likewise with the variables that are proven to affect human development are thought to affect IHD such as crime, technology and others.

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