Article Type: Research Paper

The Analysis of Inclusive Green Growth In Indonesia

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Abstract: The concept of economic growth that has increased social welfare needs to be expanded in terms of its meaning and benchmarks. It focuses not only on economic activities but also on how they impact all of society in the present and the future. This study aims to analyze Indonesia's inclusive green growth in 2015 and 2019. The method used to obtain the analysis is the Inclusive Green Growth Index (IGGI), conducted by Asian Development Bank (ADB). IGGI is a composite index consisting of three pillars: economic growth, social equity, and environmental sustainability. The study showed that Indonesia's inclusive green growth was getting better where its average score in 2015 was 3.21, increasing to 3.36 in 2019. However, the improvement is not ideal yet because its mainly influenced by the economic growth pillar. In contrast, the average score of the environmental sustainability pillar declined from 4.19 in 2015 to 4.00 in 2019, accompanied by the decreasing social equity pillar score in 15 out of 34 provinces. All Efforts to achieve a better-balanced IGGI are improving and maintaining environmental quality, improving access to economic and political activities, improving public service and infrastructure in various provinces, and increasing superior and potential sectors to pursue economic disparity inter-provincial.
Keywords: Inclusive Growth; Green Growth; Composite Index
JEL Classification: D63; E66; I31; 010

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THIS ARTICLE IS AVALILABLE IN:
http://journal.umy.ac.id/index.php/esp

DOI: 10.18196/jesp.v23i1.13811

CITATION:
Aminata, J., Nusantara, D. I. K., & Susilowati, I. (2022). The Analysis of Inclusive Green Growth In Indonesia. *Jurnal Ekonomi & Studi Pembangunan, 23*(1), 140-156.

ARTICLE HISTORY
Received:
28 Jan 2022
Revised:
21 Mar 2022
28 Mar 2022
Accepted:
14 Apr 2022

Introduction

Economic growth is one of the macro indicators that are very influential for improving social welfare. According to Palmer (2012), economic growth is critical to society because it is reflected in increasing goods and services products that can enhance social living standards. This statement is in line with Yasa and Arka's (2015) statement, which states that economic growth is a phenomenon that aims to increase national income, which will improve social welfare in general. Therefore, every single government must strive for positive and stable economic growth. One of the countries with positive and steady economic growth was Indonesia, as shown in Figure 1.

Based on Figure 1, Indonesia's economic growth has always been positive and very stable, above 5%. It has always been in the top five of the highest economic growth members of the Group of Twenty (G20), even though this growth condition has not reached the planned growth target as written in

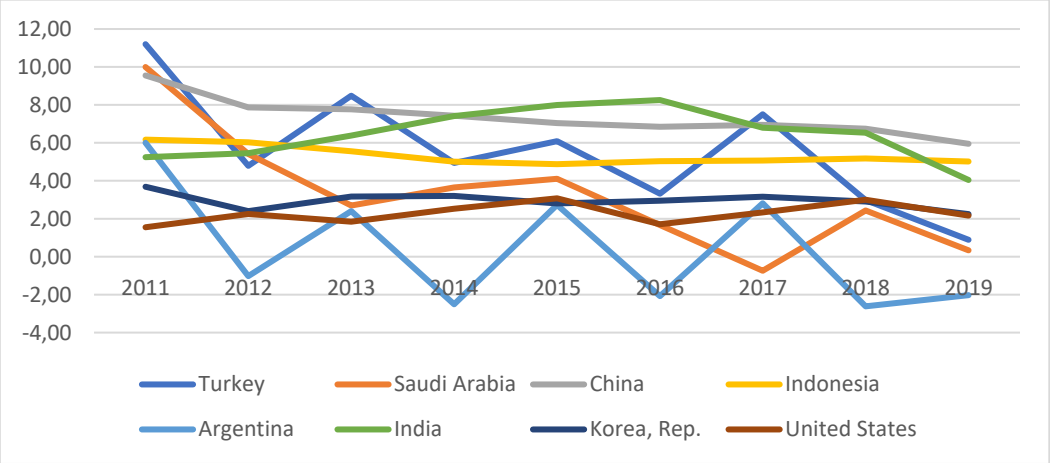

Figure 1 Top five of the highest economic growth by G-20 member in 2011-2019
Source: World Bank

the law of state budget. Unfortunately, with positive and stable economic growth, that growth is indicated to have not had a positive impact on the people who live in the present and the future. Indications showing the unequal and comprehensive effects of economic growth can be seen from the increasing Gini index from 0.36 in 2010 to 0.38 in 2021, as published by Central Bureau Statistics, Jakarta, Indonesia. Inequality is also shown from the results of the PISA's survey, which shows that the segregation rate of Indonesia's education based on the socio-economic status of students is still low, and the survey results show a deterioration in the segregation rate from 45% to 39% from 2015 to 2018 (Suprayitno, 2019). Improving education equality is vital as one of the efforts to enhance human capital that can play a role in the convergence of economic conditions in Indonesia (Anwar, 2018).

All Indications of economic growth impact that has not been spread widely and equally are also shown by several studies that have been carried out. Warsito (2020) says that the Williamson Index of Indonesia was increasing from 0.72 in 2011 to 0.76 in 2019. Another indication was also presented by Ilham and Pangaribowo (2017), who stated that Indonesia's Entropy Theil Index confirmed the existence of high inequality between provinces in Indonesia. Indications also showed by international publications from Credit Suisse (2021) that show inequality in Indonesia, where 10% of the wealthiest people in Indonesia control at least 75% of the total adult wealth. Based on this, the previous economic growth is indicated to have not yet provided an equitable positive impact for everyone or is not yet inclusive. This argument aligns with Klasen's view quoted in Kusumaningrum and Yuhan's (2019) research, which states that growth can be categorised as inclusive growth only if the process involves everyone and its results can be felt as a whole without inequality.

The impact of economic growth also needs to be measured for society in the future. As reported in the Brundtland Report, economic growth will place an excessive burden on earth in the future (Visser & Brundtland, 2013; Hamori & Kume, 2018; Hajian & Kashani, 2021). Meadows et al. convey a similar view that the current pattern of natural resource

consumption to enhance economic growth will drain out the natural resources available, and its impact will stop economic growth globally (Herrington, 2021). It is essential to measure the economic impact on the environment, considering that the environment has provided various resources that can support the production of goods and services for multiple needs of living things (Harris & Roach, 2017; Tseng et al, 2019). One way to measure and evaluate the impact of economic growth on society in the future is to internalise the concept of green growth. The idea of "green growth" is appropriate because it refers to increasing economic activity while maintaining the efficiency of natural resource consumption and minimising the harmful effects of economic activity on the environment (World Bank, 2012).

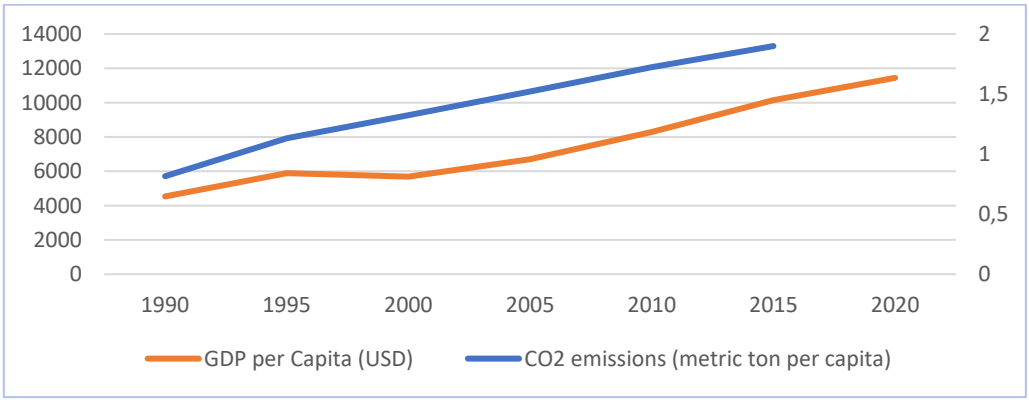

Figure 2 Carbon Dioxide and Gross Domestic Product of Indonesia from 1960-2019
Source: World Bank

Based on Figure 2, carbon dioxide (CO_2) emissions are increasing, aligning with an increase in GDP per capita. The condition indicates that Indonesia's economic activity is causing an increase in CO_2 emissions. This condition often happens, especially in developing countries like Indonesia, which use large amounts of energy to boost the economy (Adebayo, 2020). Farabi et al. (2019) and Pandit and Paudel (2016) mention another proof that increasing per capita income will raise per capita carbon emissions in Indonesia. Putriani et al. (2018) and Ilham (2021) also show that Indonesia's economic growth and development will harm environmental quality due to the increase of industrial areas and transportation. Rajagukguk (2015) states that the relationship between economic growth and the environment in Indonesia is still on the left side of the Environmental Kuznets Curve (EKC).

Considered by the superb condition of Indonesia's growth as shown in Figure 1, it will become a significant loss if there is no measurement of its impact on society that lives in the present and the future. The urgency of its measure also arises because the world has agreed on Sustainable Development Goals (SDGs) from 2015 to 2030. The SDGs have 17 goals such as eradicating poverty, reducing inequality, protecting the environment, and maintaining the availability of natural resources so that world development will be sustained and grow as a whole, not just in economic activity but also in social equity and environmental sustainability (United Nations Development Program, 2017).

Green and inclusive economic growth is an important issue. It has been the subject of the Rio+ 20 conference, and several world institutions tried to outline the definition and measurement of this concept. World Bank (2012) states that inclusive green growth is economies that grow efficiently in natural resource consumption, minimize pollution by better environmental management, and be inclusive. United Nations Environment Programme (2011) defines an inclusive green economy as an effort to improve welfare, justice, social equality, and environmental quality simultaneously. The Organization for Economic Co-operation and Development (2012) states that inclusive green growth is economic growth that maintains the quality of the environment and ensures natural resources availability. To succeed in inclusive green growth measurement, the Green Growth Knowledge Platform (GGKP) states five central themes in measuring inclusive green growth, namely (i) the availability of natural resource assets, (ii) environmental productivity, environmental intensity, and natural resources intensity, (iii) environmental quality, (iv) economic policies and opportunities, and (v) socio-economic conditions of the society (GGKP, 2013).

Many studies have tried and formulated to measure inclusive green growth and determine its forming indicators. GGKP (2016) use natural assets, resource efficiency and decoupling, risk and resilience, economic opportunities and efforts, and inclusiveness as the forming indicators. WEF (2017) uses GDP per capita, employment rate, labor productivity, health-life expectancy, median household income, poverty rate, income Gini, wealth Gini, adjusted net savings, dependency ratio, public debt, and carbon intensity of GDP. Furthermore, research from the United Nations Economic and Social Commission for Asia and the Pacific or UN ESCAP (2014) uses equitable distribution and access, structural transformation, eco-efficiency, investment in natural capital, and planetary limits as the forming indicators in calculating inclusive green growth. Sun et al. (2020) use a directional distance function and an output-oriented-slack-based measure to calculate inclusive green growth conditions in China's cities, with input and output variables used, namely labor, capital, energy, GDP as desirable output, wastewater, and also emissions as undesirable outputs. Some of these studies have various shortcomings because the indicators used are not comprehensive in accommodating important indicators to describe inclusive green growth (Jha et al., 2018).

Several previous studies are used as references to strengthen this research. Research conducted by Jha et al. (2018) succeeded in producing an inclusive green growth index (IGGI) method piloted in Asia and Asia-Pacific countries with 2015, 2010, and 2015 as the time research. Research conducted by Liderson and Pasaribu (2020), which adopted the IGGI method to all provinces of Indonesia in 2017, showed that the condition of inclusive green growth in every region of Indonesia was at the middle level. Li et al. (2021), who also adopted the IGGI method and factor analysis, shows that economic development is the main factor in deciding inclusive green growth. So it is necessary to accelerate economic development, institutional improvement, and improve relations between countries in the Asia-Pacific Region. Šneiderienė et al. (2020) show that achieving inclusive green growth in Europe varies widely, with Romania as the lowest and Luxembourg as the highest scores. Due to the lack of research with comprehensive methods, this research also refers to Sitorus and Arsani (2018), which focuses on describing inclusive growth in

every province of Indonesia using various techniques and comparing all methods. Sitorus and Arsani's (2018) results show that the condition of Indonesia's inclusive growth is at a satisfactory level, although there are still gaps in several indicators. Seeing the lack of research that accommodates the three pillars and representative indicators of inclusive green growth for 34 provinces in Indonesia, research that focuses on examining the conditions of Inclusive green growth in all areas is needed.

Previous research has shown the condition of inclusive green growth at countries level, but the study that discusses the same topic at the regional level periodically to capture its progress and using representative indicators is not that much, especially in Indonesia. Therefore, this study aims to periodically measure inclusive green growth in Indonesia's provinces in 2015 and 2019 using the IGGI method. The expected result of this study is to provide a complete description of inclusive green growth in every region of Indonesia and provide policy advice on indicators that need to be improved to achieve inclusive green growth.

Research Method

The data used for all research indicators are 2015 and 2019, obtained from various official websites. However, the data compose the Inverse indicator of coefficient variation in GRDP growth per capita using five-year data, consisting of 2011 to 2015 and 2015 to 2019. The type of data used is panel data, with the research object being 34 provinces in Indonesia. The indicator data used in this study consists of 3 pillars and 26 indicators. These indicators refer to Jha et al. (2018) and Liderson and Pasaribu (2020). The operational definition and measurement units can be seen in Table 1.

Table 1 Data and definition used in the analysis

No.	Indicators	Operational Definition	Measurement Unit	Source
Economic Growth Pillar				
1	GRDP per capita growth rate	Change in GRDP per capita between two different timeframes	Percent	BPS
2	Trade openness	The dependence of an economy on national and global economic conditions	Percent	BPS
3	Age dependency ratio	Comparison of the population at non-productive age to the people at productive age	Index	BPS
4	RRB for economy	Government spending on increasing economic growth	Billion Rupiah	DJPK
5	RRB for social protection	Government spending on protecting vulnerable groups	Billion Rupiah	DJPK
6	RRB for environment	Governments spending on maintaining environment	Billion Rupiah	DJPK
7	Primary sector of GRDP	Regional income sourced from the primary sector	Billion Rupiah	BPS
8	Secondary sector of GRDP	Regional income sourced from the secondary sector	Billion Rupiah	BPS

Table 1 Data and definition used in the analysis (cont')

No.	Indicators	Operational Definition	Measurement Unit	Source
9	Tertiary sector of GRDP	Regional income sourced from the tertiary sector	Billion Rupiah	BPS
10	The inverse of coefficient variation of GRDP per capita growth	Describing the stable condition of per capita GRDP growth	Percent	BPS
Social Equity Pillar				
11	Gini coefficient	The level of income inequality	Index	BPS
12	Gender empowerment index (IDG)	Role of women in economic and political activities	Index	BPS
13	Access to electricity	Households that able to use electricity in an area	Percent	BPS
14	Poverty rate	Population below the poverty line compared to the total population	Percent	BPS
15	Access to sanitation	Households that have access to proper sanitation	Percent	BPS
16	Access to drinking water	Population access to quality water sources	Percent	BPS
17	Average Length School	Length of time taken by residents in participating in formal education	Year	BPS
18	Expected age life at birth	Estimated reachable age calculated from a person was born	Year	BPS
19	Net enrollment rate (NER)	The proportion of the population in a particular age group who attends a certain level of education	Percent	BPS
20	The ratio of the working and working-age population	The proportion of the working-age population to the labour force	Percent	BPS
21	Gender Gap in NER	Gaps of formal education access by gender	Ratio	BPS
22	Gender Gap in labour force participation rate (LFPR)	The gap in the labour force participation by gender	Ratio	BPS
23	Gender Gap in life expectancy	Gender gaps related to health problems	Ratio	BPS
Environmental Pillar				
24	Water Quality Index (WQI)	Condition of water in an area at a particular time	Index	KLHK
25	Air Quality Index (AQI)	Level of air in an area at a certain period	Index	KLHK
26	Land Cover Quality Index (LCQI)	Area of forest cover and swamp scrub	Index	KLHK

Notes: BPS (Central Bureau Statistics of Indonesia), DJPK (Directorate General of Fiscal Balance, Ministry of Finance), KLHK (Ministry of Environment and Forestry)

The analytical method used in this study uses the IGGI method conducted by Jha et al. (2018), which consists of several stages, namely as follows:

Data Normalization

The normalization stage is required to change and equalize the data measurement unit so the data can be compared. The result of normalization data will be a value range from 1 to 6, with score one being the worst and score six being the best. Normalization carried out in this paper using the Min-Max Normalization method is as follows:

Indicators with a positive impact on IGGI:

$$Z = 5 \text{ x } \frac{X - \min(x)}{[\max(x) - \min(x)]} + 1 \quad (1)$$

Indicators with a negative impact on IGGI:

$$Z = -5 \text{ x } \frac{X - \min(x)}{[\max(x) - \min(x)]} + 6 \quad (2)$$

Where: Z is the result of normalization, X is the value of an indicator, Max (x) is the highest value of an indicator, dan Min (x) is the lowest value of an indicator.

IGGI Calculations

The IGGI calculation begins by adding up all the values of indicators that have been normalized on the same pillar. After that, find the average of each pillar and combine it with the calculation of the other pillars. The measures are as follows:

$$\text{IGGI} = \frac{1}{3}(\text{EPA}) + \frac{1}{3}(\text{SIPA}) + \frac{1}{3}(\text{ERPA}) \quad (3)$$

Where: IGGI is Inclusive Green Growth Index, EPA is Economic Pillar Average, SEPA is Social Equity Pillar Average, dan ESPA is Environmental Sustainability Pillar Average.

Pillar Gap

This stage is necessary considering the goal of IGGI is to obtain a balanced result between the pillars, not only high in the economic growth pillar but also needing to be accompanied by a high score on social equity and environmental sustainability pillar. The calculations at this stage are as follows:

$$\text{Total Gap} = [\text{EPA-SIPA}] + [\text{SIPA-ERPA}] + [\text{ERPA-EPA}] \quad (4)$$

Where: EPA is Economic Pillar Average, SEPA is Social Equity Pillar Average, dan ESPA is Environmental Sustainability Pillar Average.

Balanced IGGI

The last step in the IGGI calculation is to enter the total gap into the IGGI calculation as one of the pillars. Before being included in the final calculation, the total gap needs to be normalized with the following formula:

$$\text{CPB} = -5 \text{ x } \frac{\text{Total Gap} - \min(\text{tg})}{\max(\text{tg}) - \min(\text{tg})} + 6 \quad (5)$$

Where: CPB is Cross Pillar Balance, Max (tg) is the highest value of total gap, Min (tg) is the lowest value of total gap.

After obtaining the CPB value, its value is entered into the IGGI calculation as a balancing pillar. The calculation of balanced IGGI is as follows:

$$\text{Balanced IGGI} = \frac{3}{4} (\text{IGGI}) + \frac{1}{4} (\text{CPB}) \quad (6)$$

Result and Discussion

Table 2 shows the results of the descriptive statistics of all the indicators used in the study. It can be seen that the data of economic growth and environmental sustainability indicators are distributed widely, as evidenced by the wide range between the minimum and maximum values. Meanwhile, the social equity pillar data is distributed more equally than the other pillar.

Table 2 Descriptive Statistics

Indicators	N	Minimum	Maximum	Mean	Std. Deviation
G.GRDP per capita	68	-17.16	20.20	3.53	3.95
Trade Openness	68	20.10	310.63	98.61	48.46
DependencyRatio	68	39.49	66.74	50.41	5.68
RRBeconomic	68	1.61E+11	5.20E+12	6.72E+11	8.33E+11
RRBsocial	68	2.05E+10	1.46E+12	1.09E+11	2.00E+11
RRBenvironment	68	2.30E+09	5.05E+12	1.44E+11	6.48E+11
primaryGRDP	68	4225.54	267158.45	60611.33	66505.74
secondaryGRDP	68	2461.00	774525.75	101679.41	171189.78
tertiaryGDRP	68	10054.92	1388568.94	138205.08	262400.53
InvCV	68	-0.37	70.29	13.34	14.33
Gini	68	0.26	0.43	0.35	0.04
IDG	68	48.19	83.20	68.05	6.76
Electricityaccess	68	39.16	100.00	91.73	11.40
Poverty	68	2.61	26.55	8.99	4.93
Sanitationaccess	68	8.68	91.19	55.20	18.70
Drinkwateraccess	68	31.02	99.82	71.76	17.19
ALS	68	5.99	11.06	8.28	0.97
Exp.agelife	68	64.22	74.92	69.61	2.60
NERelem.sch	68	78.56	99.53	96.48	3.56

Table 2 Descriptive Statistics (cont')

Indicators	N	Minimum	Maximum	Mean	Std. Deviation
NERjunior.sch	68	54.21	86.75	76.46	6.32
NERsenior.sch	68	43.22	73.01	61.33	6.13
worktoworkage	68	55.08	76.40	63.73	4.37
Gen.Gap.NER.ES	68	0.97	1.04	1.00	0.01
Gen.Gap.NER.JS	68	0.85	1.10	0.97	0.05
Gen.Gap.NER.SS	68	0.79	1.22	0.95	0.08
Gen.Gap.Life.exp	68	0.94	0.95	0.95	0.00
Gen.Gap.Labor	68	0.46	0.80	0.62	0.08
WQI	68	21.84	88.33	58.79	15.84
AQI	68	50.65	96.94	86.85	8.00
LCQI	68	24.66	100.00	59.88	16.14
Valid N (listwise)	68				

Indonesia Balanced IGGI

Table 3 shows the average of every pillar score and the balanced IGGI achieved by every province. The average of balanced IGGI is improving; in 2015, the average score obtained was 3.21, which increased to 3.36 in 2019. This improvement is positive because there is progress even though it is not ideal yet. This improvement cannot be said as a perfect improvement because the environmental sustainability pillar is decreasing in 24 provinces, and the social equity pillar is also reducing in almost 50% of areas in Indonesia. Therefore, it is essential to pay attention to the improvement in the three pillars because the primary purpose of inclusive green growth is to create good economic growth, improve social inclusiveness conditions, and maintain environmental sustainability simultaneously.

In 2015, the top three provinces with the highest balanced IGGI scores were East Java, Central Java, and West Java. These three received the highest scores due to their high scores in every pillar. Meanwhile, West Papua, West Sulawesi, and Maluku are the three provinces with the lowest scores. These three provinces received low scores due to the high cross-pillar balance score, which was due to the high value of the environmental pillar but the low score on the economic pillar, thereby reducing the balanced IGGI.

In 2019, the provinces with the highest balanced IGGI scores were East Java, Central Java, and East Kalimantan. East Kalimantan is becoming one of the provinces with the best balanced IGGI score due to their improvement on economic growth and social equality pillars. The provinces with the lowest balanced IGGI score in 2019 were Papua, West Papua, and DKI Jakarta. DKI Jakarta has fallen to one of the provinces with the lowest score due to their achievement on the environmental sustainability pillar. This is important to be noticed by the DKI Jakarta Province, considering that its economic growth pillars are the highest, but its environmental sustainability pillar is the worst.

Table 3 Scores of Economic Growth, Social Equity, Environmental Sustainability Pillars, and Balanced IGGI in 2015 and 2019

Province	2015					2019				
	EPA	SIPA	ERPA	Balanced IGGI	IGGI Rank	EPA	SIPA	ERPA	Balanced IGGI	IGGI Rank
Aceh	1.82	3.43	4.82	3.05	22	2.15	3.53	4.85	3.21	23
North Sumatera	2.12	3.76	4.31	3.37	8	2.50	3.87	3.60	3.74	4
West Sumatera	2.05	3.46	3.47	3.34	9	2.25	3.45	4.20	3.43	16
Riau	2.02	3.53	2.65	3.11	21	2.33	3.73	3.85	3.66	6
Jambi	1.88	3.39	3.62	3.20	16	2.32	3.55	4.18	3.52	14
South Sumatera	1.92	3.52	4.18	3.20	15	2.28	3.59	4.00	3.54	11
Bengkulu	1.77	3.13	5.00	2.93	27	2.29	3.37	3.89	3.53	12
Lampung	1.98	3.25	3.69	3.21	14	2.37	3.55	3.47	3.70	5
Bangka Belitung Islands	1.72	4.03	4.53	3.17	20	2.01	3.61	4.58	3.20	24
Riau Islands	2.24	3.89	4.61	3.44	6	2.38	3.81	4.14	3.64	7
DKI Jakarta	4.36	4.54	2.03	3.44	7	4.67	4.45	1.32	2.86	32
West Java	3.10	3.36	3.66	3.92	3	3.20	3.69	2.27	3.52	13
Central Java	3.13	3.97	3.53	3.95	2	3.09	3.98	3.45	4.13	2
DI Yogyakarta	2.23	4.47	2.78	3.17	19	2.21	4.56	2.29	3.02	27
East Java	3.52	3.71	3.77	4.25	1	4.24	3.82	3.30	4.31	1
Banten	2.17	3.40	2.72	3.22	12	2.46	3.61	2.15	3.27	20
Bali	2.19	4.71	4.71	3.61	4	2.25	4.56	4.25	3.55	10
West Nusa Tenggara	1.96	3.22	3.49	3.22	13	1.91	3.23	3.41	3.32	18
East Nusa Tenggara	1.58	2.91	3.75	2.89	31	1.80	2.88	4.35	2.91	30
West Kalimantan	1.72	3.37	4.91	2.97	26	2.05	3.26	3.92	3.31	19
Central Kalimantan	1.94	3.67	4.76	3.19	17	2.23	3.65	4.54	3.38	17
South Kalimantan	1.87	3.60	3.31	3.17	18	2.20	3.52	3.81	3.51	15
East Kalimantan	2.40	4.04	5.43	3.49	5	2.83	4.18	5.13	3.81	3
North Kalimantan	1.61	3.96	5.43	3.00	24	2.06	3.88	4.89	3.22	22
North Sulawesi	1.99	3.70	4.12	3.30	10	2.18	3.86	3.84	3.57	9
Central Sulawesi	1.93	3.14	4.95	3.03	23	2.25	3.30	5.26	3.13	26
South Sulawesi	2.01	3.43	4.00	3.25	11	2.42	3.62	4.27	3.59	8
Southeast Sulawesi	1.45	3.78	4.78	2.92	28	1.97	3.69	4.27	3.27	21
Gorontalo	1.73	2.96	4.58	2.91	29	2.12	2.98	4.50	3.14	25
West Sulawesi	1.52	2.82	4.30	2.77	33	1.88	2.70	4.45	2.90	31
Maluku	1.44	3.54	4.87	2.85	32	1.80	3.46	4.86	2.93	29
North Maluku	1.64	3.61	5.00	2.97	25	1.87	3.56	4.84	3.01	28
West Papua	1.70	2.77	5.49	2.75	34	1.92	2.80	5.17	2.78	33
Papua	1.96	2.66	5.31	2.90	30	1.74	2.05	4.83	2.54	34

Economic Growth Pillar

The economic growth pillar has increased from 2.08 in 2015 to 2.36 in 2019, as shown in Table 1. Figure 3 shows that DKI Jakarta Province has the highest scores on the economic growth pillar, both in 2015 and 2019. This achievement is due to its high score in every indicator, except for the primary sector of GRDP. Moreover, DKI Jakarta's GRDP is the highest among 34 provinces, which effecting on their realized regional budget (RRB) for social protection, environment, and economic growth are also the highest. At the same time, Maluku and Papua are the provinces with the lowest economic growth achievement pillars in 2015 and 2019. Factors that influence their low achievement are the high age dependence ratio, low GRDP in all sectors, and unstable GRDP per capita growth.

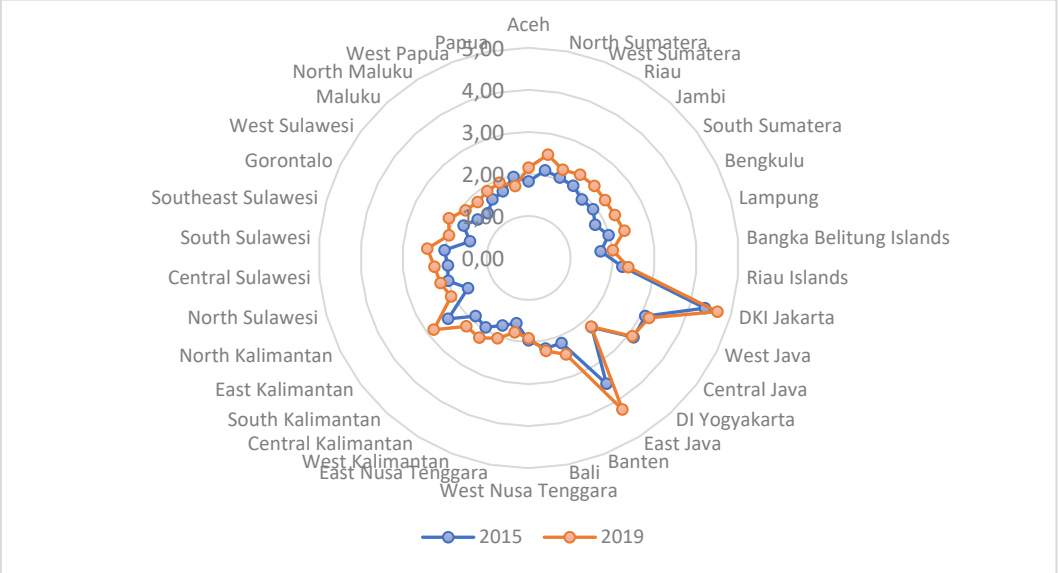

Figure 3 Economic Growth Pillar in 2015 and 2019

There are several important notes related to the result of this pillar. The first is that the pillars of economic growth increased in almost every province. This result is in line with the research conducted by Jha et al. (2018), which states that there has been an improvement in economic conditions in Indonesia. This improvement is significant because, as stated by Klasen (2010) and Wafiq and Suryanto (2021) that rapid economic growth is a prerequisite for an economy to achieve inclusive growth and maintain environmental quality. However, four provinces suffer a decline in the economic growth pillar, namely Central Java, DI Yogyakarta, West Nusa Tenggara, and Papua. Another important note is economic disparities between provinces in the Western Region of Indonesia (WRI) and the Eastern Region of Indonesia (ERI). This disparity can be seen by the top ten provinces with the highest scores which 9 of them are provinces from WRI while only 1 of them is from ERI. This disparity phenomenon is in line with the research results conducted by Liderson and Pasaribu (2020), which showed economic disparities between provinces in WRI and ERI. The main reason for the disparity phenomenon is a high gap in GRDP receipts between provinces, which affects the RRB. Economic inequality circumstances and its cause are in line with Ilham's (2021) research which states the dominance of Java Island in the national economy, which can be seen from the considerable GRDP revenue of the province in Java Island, and this GRDP gap is because Java is densely populated compared to other islands. Therefore, the solution needed is to increase sectors and business fields, especially leading and potential sectors, in all provinces to create new growth poles and equalize the population distribution.

Social Equity Pillar

The social equity pillar is improving, from the average score of 3.55 in 2015 to 3.57 in 2019, as shown in Table 1. This improvement was less significant than in the economic growth pillar because 15 provinces, or almost 50% of the entire provinces in Indonesia, suffered declining scores. As shown in Figure 4, the province with the highest scores was

Bali in 2015 and DI Yogyakarta in 2019. Both regions have exemplary achievements in some indicators, like better public service and infrastructure, access to education, and access to jobs for all genders. Unfortunately, DI Yogyakarta, as the best province in 2019, suffers a high Gini coefficient reflecting high-income disparities. At the same time, Papua is the province with the lowest score on the social equity pillar in 2015 and 2019. Papua received a low score because of their low access for the household to some public service and infrastructure, such as sanitation, electricity, clean water, drinking water, and also the high poverty rate in Papua. Low access for the household to public service and infrastructure shows that Papua must improve its economic infrastructure for the society. The results align with Kusumaningrum & Yuhan's (2019) and Sitorus and Arsani's (2018) research, which states that social equity in Indonesia's province is at a moderate level except for Papua, which is unsatisfactory because of the lack of public service and infrastructure.

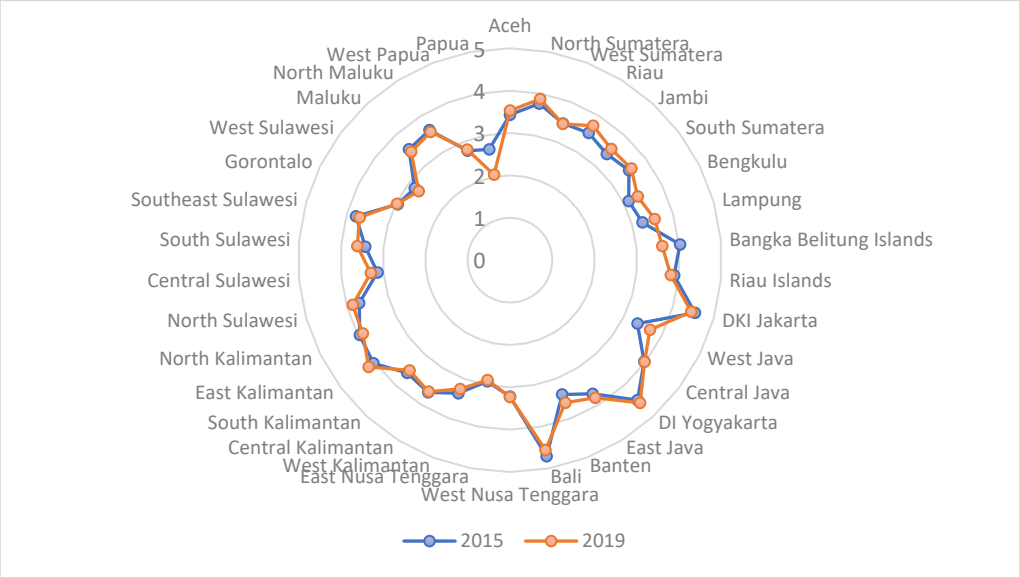

Figure 4 Social Equity Pillar in 2015 and 2019

Some important notes need to be solved in almost every province on this pillar. First, the access for every gender on economic and political activities needs to be improved because the gender empowerment index and the gap of labour force participation rate (LFPR) between genders show a high gap between men and women on participating in economic and political activities. Increasing the role of women in economic and political activities is essential, considering this can boost Indonesia's economic incentives (Nazah et al., 2021). Second, the participation rate in primary education, especially at the high school level, needs to be improved because the net enrolment rate (NER) for the high school level falls off drastically from the junior high school level. This note is not matched with the results of Robert's research which concludes that the performance of Indonesia's education is already good based on its school enrolment. It is undeniable that in general, the conditions for school enrolment in Indonesia are good, but what needs to be noted is that the compulsory education program in Indonesia is divided into three levels, namely elementary, junior, and senior high school, and based on the data obtained, participation

at the senior high school level is highly decreased compared to elementary and junior high school. Therefore, it is crucial to increase educational participation by improving school enrolment at the senior high school level to complete compulsory study programs because education has a central role in accelerating growth in Indonesia (Anwar, 2018). Third, a low level of household access to public services and infrastructures in several provinces such as Papua and Bengkulu. This note is essential considering the goals of inclusive green growth is growth and development that can be felt equally so that no one is left behind (Jha et al., 2018).

Environmental Sustainability Pillar

The environmental sustainability pillar declined from 4.19 to 4.00 in 2019, the weakening of the environmental pillar is in line with Robert's research which states that Indonesia has a weak environmental performance, thereby increasing the score of the total gap between pillars (Jha et al., 2018). It can be seen in Figure 5 that the provinces with the highest scores are West Papua Province in 2015 and Central Sulawesi in 2019. Their high performance is due to their water, air, and land cover quality scores. At the same time, DKI Jakarta was the worst province in 2015 and 2019. Their low achievement on environmental sustainability was low because their water, air, and land cover quality score were low, especially in their achievement for air and land cover quality which is the worst among 33 other provinces. The results of this study are in line with the results of Liderson and Pasaribu (2020), who states that one of the provinces with the lowest scores in environmental sustainability pillars is DKI Jakarta.

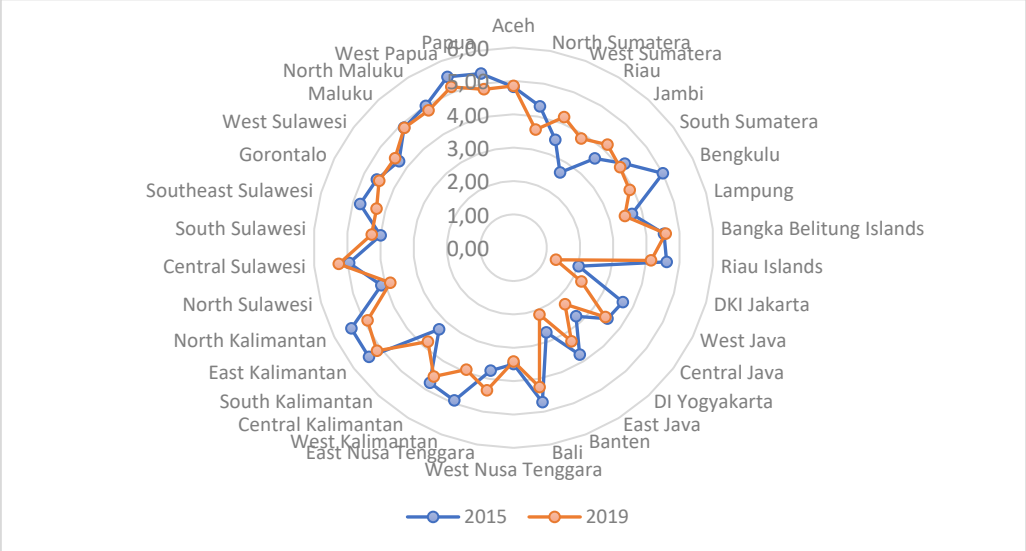

Figure 5 Environmental Sustainability in 2015 and 2019

In contrast to the economic growth pillar, provinces on Java Island achieved a lower environmental sustainability pillar score than provinces on the other island. This phenomenon also applies to comparisons between regions where the achievements of provinces in ERI are higher than provinces in WRI. The low scores of Java Island and the

WRI Regency are in line with research by Liderson and Pasaribu (2020), which shows that the achievement of environmental pillars in ERI province is higher than in WRI even Ilham (2021) mentions that several areas in WRI are in hazardous environmental conditions. Furthermore, all governments in Indonesia need to pay attention to their environmental sustainability because there has been a fall in the environmental sustainability pillar from 2015 to 2019. Figure 5 shows that 24 provinces experienced a decrease in the environmental sustainability pillar in 2015 and 2019. The degradation of environmental quality is not a good sign, considering that the inclusive green growth concept is to maintain ecological sustainability for a better and more sustainable future (World Bank, 2012).

Conclusion

This study aims to measure inclusive green growth in Indonesia and see its progress in 2015 and 2019. The contribution made through this research is capturing and describing the indicators that compose green and inclusive growth concepts in Indonesia's Province. A common problem related to IGGI in Indonesia is that although there is an improvement on balanced IGGI, this improvement is not ideal and desired yet. It is not perfect yet because economic growth is the central pillar that influences the progress while the environment and social equity are declining in 15 - 24 provinces.

Furthermore, specific issues need to be resolved in each constituent pillar. In the economic growth pillar, issues related to disparities of GRDP receipt need to be solved so the RRB can also be increased. In the social equity pillar, problems related to the gender access gap on economic and political activities, NER for senior high school level, and household access for economic infrastructure need to be boosted. It is vital so the current development can be inclusive by participating more people in the process and everyone comprehensively feels the impact. The next issue is water, air, and land cover degradation in the environmental sustainability pillar that needs to be addressed immediately. It is essential to protect and preserve the environment to achieve better development for the future society.

Suggestions made from this study are to encourage the government to provide some data related to environmental sustainability that the public can access and available at every government level, not only at the national but also at the regional level. Data availability is essential so that further research can be more representative in describing the inclusive green growth in Indonesia. Another suggestion is to solve each specific issue in the constituent pillar mentioned above so the improvement of balanced IGGI in Indonesia can be ideal and in accordance with the main objectives of the inclusive green growth concept. This research focuses on describing the forming indicators of IGGI, so further research is needed regarding strategies and factors that can affect and accelerate the improvement of balanced IGGI with all the special conditions and characteristics in each province.

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