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**GREEN GDP VALUATION AND INFLUENCING FACTORS  
(CASE STUDY OF INDONESIA AND MALAYSIA)**

**RESEARCH TEAM**

**Universitas Mercu Buana:**

Prof. Dr. Noor Salim, MM : NIDN. 8899350017  
Eri Marlapa, SE., MM : NIDN. 0318037704

**Universitas/Institusi Mitra:**

: Universiti Teknologi MARA Melaka

Dr. Nurhayati Abd Rahman : NIDN

: Universitas Borobudur

Prof. Dr. Ir. Darwati Susilastuti, MM : NIDN. 0008026101  
Edi Wahyu Wibowo, S.Sos., MM : NIDN. 0315117901

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**Principal Researcher**

a. Full name/NIDN : Prof. Dr. Noor salim, /8899350017  
b. Designation : Guru Besar  
c. Department : Magister Manajemen  
d. Mobile Phone : 0811904509  
e. e-mail : 1975801189@mercubuana.ac.id

**Research Member 1**

a. Full Name/NIDN : Eri Marlapa, SE, MM/616770061  
b. Department : Manajemen S1 - Pending

**Student Member**

a. Full Name/NIM : HENDRI HERMAWAN/55119310042  
b. Full Name/NIM : SOVIA ALI INTAN SARI/43117110070

**International Partner**

a. Full Name : Dr. Nurhayati Abd Rahman  
b. Identity Number :  
c. Name of Institution : Universiti Teknologi MARA Melaka  
c. Address of Institution : -

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Acknowledged by,

Head Of Manajemen Department

Dr Indra Siswanti,  
NIP/NIK. 616640080

Principal Researcher



Prof. Dr. Noor salim,  
NIK. 115470495

Approved by,

Head of Research, Community  
Services and Publication Bureau

Dr. Ir. Sawarni Hasibuan, MT  
NIK: 115650472

## TABLE OF CONTENTS

	Page
<b>COVER</b> .....	<b>i</b>
<b>APPROVAL FORM</b> .....	<b>ii</b>
<b>TABLE OF CONTENTS</b> .....	<b>iii</b>
<b>LIST OF FIGURES</b> .....	<b>iv</b>
<b>LIST OF TABLES</b> .....	<b>v</b>
<b>ABSTRACT</b> .....	<b>vii</b>
<b>CHAPTER 1 INTRODUCTION</b> .....	<b>1</b>
1.1 Introduction.....	1
1.2 Identification of Problems .....	9
1.3 Restricting The Problem .....	10
1.4 Formulation of The Problems .....	10
<b>CHAPTER 2 LITERATURE REVIEW</b> .....	<b>11</b>
2.1. Relevant Previous Research.....	11
2.2. Theoretical Review.....	15
2.3. Framework.....	17
2.4. Hypothesis .....	20
<b>CHAPTER 3 Research Purpose &amp; Contribution</b> .....	<b>21</b>
3.1. Research Purpose.....	21
3.2. Contribution.....	21
<b>CHAPTER 4 RESEARCH METHOD</b> .....	<b>22</b>
4.1 Research Area.....	22
4.2 Population, Sample, and Research Sampling. ....	22
4.3 Method and Research Design .....	23
4.4 Data and Data Collection Methods.....	23
4.5 Variables and Variable Operational Definition .....	23
4.6 Data and Data Collection Methods.....	23
<b>CHAPTER 5 IMLEMENTATION OF RESEARCH COLLABORATION</b> .....	<b>27</b>
<b>CHAPTER 6 RESULT &amp; DISCUSSION</b> .....	<b>28</b>
6.1 Profile of Indonesia & Malaysia.....	28
6.2 Overview of Research Operational Variables .....	31
6.3 Result / Analysis Data .....	37
6.4 Discussion .....	53
<b>CHAPTER 7 CONCLUSION &amp; SUGGESION</b> .....	<b>57</b>
7.1 Conclusion.....	57
7.2 Suggestion .....	57
<b>REFERENCE</b> .....	<b>59</b>
<b>DRAFT OF ARTICLE JORUNAL</b> .....	<b>60</b>

## LIST OF FIGURES

Figure 3.1	Logical Framework .....	23
Figure 4.1.	Research Stages Diagram .....	25
Figure 6.1	Indonesia Map and others Country in ASIA.....	30

## LIST OF TABLES

Table 1.1	GDP & Population Indonesia & Malaysia Performance....	4
Table 1.2	Air Pollution Rates in Indonesia & Malaysia 2010-2018 ..	4
Table 1.3	Death Data due to Unclean Air Pollution & Sanitation in Indonesia & Malaysia in 2016 .....	5
Table 1.4	Number of Tuberculosis (TBC) patients in Indonesia & Malaysia 2010-2019 .....	5
Table 1.5	Area of agricultural and forestry land in Indonesia & Malaysia 2010-2018 .....	6
Table 1.6	Agricultural and fisheries products in Indonesia & Malaysia 2010-2018 .....	6
Table 1.7	Figures of Net Trade in goods & services Indonesia & Malaysia in 2010-2019 .....	7
Table 1.8	Figures of Net Capital Account Indonesia & Malaysia 2010-2019 .....	7
Table 1.9	Total Labor Force and Unemployment in Indonesia & Malaysia 2010-2020 .....	8
Table 1.10	Indonesia & Malaysia Gini Index 2010-2019 .....	8
Tabel 2. 1	Previous Research .....	11
Table 6.1	GDP Indonesia & Malaysia 1990 – 2019.....	31
Table 6.2	Net Trade Indonesia & Malaysia Yaer 1990 – 2019 ....	32
Table 6.3	Green Openness Indonesia & Malaysia 1990 – 2019...	33
Table 6.4	Labor Force Indonesia & Malaysia 1990 – 2019 .....	34
Table 6.5	Gross Capital Indonesia & Malaysia 1990 – 2019 .....	35
Table 6.6	Dispariity (GINI Index) Indonesia & Malaysia 1990-2019	36
Table 6.7	Depletion Natural Source (%) Indonesia & Malaysia	37
Table 6.8	Depletion Natural Source Indonesia & Malaysia 1990-2019	38
Table 6.9	Semi Green GDP Indonesia & Malaysia 1990-2019....	39
Table 6.10	Total CO <sup>2</sup> M <sup>3</sup> Indonesia & Malaysia 1990 – 2019 .....	40

Table 6.11	Total Trembesi Tree Indonesia & Malaysia 1990 – 2019...	41
Table 6.12	Total Degradation Indonesia & Malaysia 1990 – 2019....	42
Table 6.13	Green GDP Indonesia & Malaysia 1990 – 2019.....	43
Table 6.14	Green Openness Stationary Test .....	44
Table 6.15	Labor Force Stationary Test.....	44
Table 6.16	Gross Capital Stationary Test.....	45
Table 6.17	Gren GDP Stationary Test.....	45
Table 6.18	Disparity (Index GINI) Stationary Test.....	46
Table 6.24	Cointegration Test Formula 1 .....	47
Table 6.25	Cointegration Test Formula 2.....	47
Table 6.28	Multicollinearity Test Formula 1.....	48
Table 6.30	Heteroscedasticity Test Formula 1.....	49
Table 6.31	Heteroscedasticity Test Formula 2.....	49
Table 6.35	Autocorrelation Test Formula 1 .....	50
Table 6.36	Autocorrelation Test Formula 2.....	50
Table 6.39	t Test Formula 1.....	51
Table 6.40	t Test Formula 2 .....	51
Table 6.43	F Test Formula 1 .....	52
Table 6.45	Coefficient Determinat Formula 1 .....	53
Table 6.46	Coefficient Determinat Formula 2 .....	53
Table 6.49	t-test Different Test Green GDP .....	54

## ABSTRACT

To overcome the weakness of conventional economic growth, a green growth strategy is needed. The green growth strategy focuses on the positive mutual reinforcement of economic and environmental policy aspects. To realize the principles of sustainable development, especially in the application of a green economy in Indonesia and Malaysia, a policy was made to support this program. The government of the Unitary State of the Republic of Indonesia made real efforts as stated in the RPJPN 2005-2025 as one of the long-term development missions. Meanwhile in Malaysia, the green economy concept has been initiated by the government in terms of technological evolution, through the establishment of the Ministry of Energy, Green Technology and Water (KeTTHa) in 2009. Under the Eleventh Malaysia Plan (RMK, 2015), the government has introduced the Malaysian Quality of Life Index (MQLI) in 1999 to provide an aggregate measure of sustainable living (EPU, 1999).

This study analyzes the influence of openness, capital, and labour credit on the Green GDP and their impact on Green GDP its implications for income disparity/gap. Knowing the comparison of the green GDP in Indonesia and in Malaysia.

The study used secondary data annual 1990-2019 obtained through related agencies. The data analysis method uses OLS Multiple Linear Regression which begins with the Stationarity Test and Cointegration Test. Determination of the dominant factor and the amount of contribution using the beta value ( $\beta$ ). The dependent variable difference test (t test difference) is to determine the comparison of the green GDP in Indonesia and Malaysia.

Result of research, For the Green Economy Valuation calculated from Conventional GDP minus the Depletion Natural Source value, we get Semi Green GDP, while the Green GDP value is obtained from Semi Green GDP minus the Degradation value. The degradation value is obtained from the total costs incurred to overcome air pollution by planting trembesi trees. For Indonesia there is a positive simultaneous influence between Green Openness, Labor Force and Capital on Green GDP, while partially there is a positive influence of Green Openness and Capital on Green GDP, but for labor force there is a negative influence on Green GDP. For the simultaneous effect of Green Openness, Labor Force and Capital on Green GDP of 86.5%, the rest is influenced by other variables. For Indonesia, the most dominant variable affecting Green GDP is Green Openness of 7.44 times, then Capital of 0.13 times, while the labor force variable has a decrease of 3.15 times. For Green GDP itself there is a positive influence on Disparity (GINI Index), while Green GDP has an effect on Disparity (GINI Index) of 72.9%, the rest is influenced by other variables. For the t-test difference on the Green GDP variable, it states that there is a significant difference in Green GDP between Indonesia and Malaysia.

Suggestion of research, the green economy valuation can be increased again by calculating the degradation from the reduction of land for growing rice as a basic need. Although the results of this research, Green Openness, Labor Force and Capital simultaneously have a good effect on Green GDP, it can still be improved by creating a green economy development program (Green Campaign) such as increasing urban farming activities and reducing carbon, air and water pollution. There should be further research on the variables to be studied more, so that the dominant variables will be the best. Although the results of this study that Green GDP has a good effect on Disparity (GINI Index), it can still be improved by making programs in the smallest areas (villages) so that development will be felt equally between villages and cities, the impact of differences in disparity will be small. The results of the Green GDP research on Indonesia and Malaysia are good, but need to be improved for further research in ASEAN countries

Keywords: Green Economy; Green GDP; Sustainable Development; Income Disparity

## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction

The concept of sustainable development is currently getting attention from various parties. The population density factor is an important factor that demands the availability of sufficient natural resources, this is the main problem that must be found an effective and efficient solution. Sustainable development is the integration between the economy and the environment as a human effort to improve the quality of life. Economic development based on natural resources that does not pay attention to aspects of environmental sustainability will ultimately have a negative impact on the environment itself. Basically, natural resources and the environment have a limited carrying capacity. In other words, economic development that does not pay attention to the capacity of natural resources and the environment will cause development problems in the future (Burhanudin, 2016, p.11).

In the conventional economic system, economic growth is the most important economic indicator. Economic growth is calculated based on the increase in the value of the Gross Regional Domestic Product (GDP). GDP which is currently known as conventional GDP or Brown GRDP. Brown / conventional GRDP is considered not to describe the situation of sustainable economic development because its value still contains depreciation in the value of natural resources and is indicated to contain the value of degradation of environmental benefits. The growth that occurs in the economic system is faced with unfavorable environmental system conditions. The amount of material and energy provided by the environmental system does not increase. Therefore, in certain situations the optimal point of economic growth will be reached. If the optimal point has been reached, the value of losses due to waste and degradation of materials and environmental services will be greater than the benefits derived from economic growth (Rahmat, 2016. p,209-217).

To overcome the weakness of conventional economic growth, a green growth strategy is needed. The green growth strategy focuses on the positive mutual reinforcement of economic and environmental policy aspects. Green growth takes into account the total value of natural capital as a factor of production and its important role in growth. Green growth also focuses on finding cost-effective ways to reduce pressure on the environment so that the transition to a new growth pattern that can be created does not exceed the carrying capacity of the environment. In green growth innovation plays an important role, because depletion of natural resources at a certain point will have a negative impact on growth. Innovation can play a role in creating substitutions for depleted



natural resources to support growth. The green growth strategy recognizes that the measurement of economic progress should take into account the contribution of natural resource assets to the well-being, health and prosperity of mankind. Measurement of economic progress also concerns the quality and composition of growth as well as the impact of growth on human welfare (DAN, D. B. S. D. A., 2013, pp. 14-18).

To realize the principles of sustainable development, especially in the application of a green economy in Indonesia and Malaysia, a policy was made to support this program. The government of the Unitary State of the Republic of Indonesia made real efforts as stated in the RPJPN 2005-2025 as one of the long-term development missions. The National Long-Term Development Plan (RPJPN) 2005-2025 lays out the vision of Indonesia's development which is independent, advanced, just and prosperous. The conditions described in this vision are marked by the level of independence, progress, justice, and prosperity to be achieved. Development as an effort to fill independence must be an effort to build independence. In one of the 8 (eight) development missions to achieve the conditions described in the vision, especially those related to sustainable development, the 6th vision is: Indonesia Asri and Lestari. To achieve this, the missions to be pursued are: (i) improving the management of development implementation that can maintain a balance between utilization and sustainability; (ii) the existence and utilization of natural resources and the environment while maintaining the function, carrying capacity and comfort in life today and in the future through the use of space that is in harmony between utilization for settlements, socio-economic activities and conservation. efforts, improve the economic utilization of resources. sustainable natural resources and environment; (iii) improve the management of natural resources and the environment to support the quality of life, provide the beauty and comfort of life, and increase the maintenance and utilization of biodiversity as the basic capital of development.

Meanwhile in Malaysia, the green economy concept has been initiated by the government in terms of technological evolution, through the establishment of the Ministry of Energy, Green Technology and Water (KeTTHa) in 2009. Under the Eleventh Malaysia Plan (RMK, 2015), the government has introduced the Malaysian Quality of Life Index (MQLI) in 1999 to provide an aggregate measure of sustainable living (EPU, 1999). This emphasizes the importance of balanced development, which is able to support sustainable economic growth, thereby providing a high quality of life for the community (EPU, 2011 & 2013). The Malaysian government's proactive actions in MQLI (2011) and the green economy concept appear to complement each other in meeting the needs of the whole community.

As reported by the OECD Investment Policy Review in 2013, the Malaysian government has placed a positive emphasis on implementing sustainable development, and has understood the

need to conserve the environment rather than focusing solely on the country's economic development. Major changes in environmental policy and public acceptance of the impact of the environment on their quality of life are important. Hence, a comprehensive set of policies and laws have been drafted which includes the National Climate Change Policy, Green Technology policy and Renewable Energy policy for Malaysia (KeTTha, 2015). All these proactive actions have been made to demonstrate the proper movement of the government to support green growth for the benefit of the people. According to Hezri and Ghazali (2011) Malaysia's national green economy framework reflects mainstream economic framing, such as the United Nations Economic Program (UNEP) and the Organization for Economic Cooperation and Development (OECD). The main objective is to strengthen the Malaysian economy through incentives, tax system, pricing, regulatory framework, and prioritizing all investments (Lestari, 1999 in Abdul Hamid, 2019).

Conventional GDP valuation Methods can interpret the progress of economic development, especially the impact of environmental pollution, so the importance of evaluating Green GDP is to calculate environmental aspects that are not carried out on Conventional GDP, so that by calculating Green GDP it is clear the impact of losses from economic development that does not pay attention to environmental factors. As a reference for the calculation of Green GDP by Wibowo, E. W et.al (2021) for the province of Jakarta as the capital of the State of Indonesia. In 2019 the province of DKI Jakarta obtained a GDP of Rp. 1,842,996,120 (million), - while the 2019 green GDP valuation result is Rp. 1,824,804,136 (million), from these results the impact of the green economy is not implemented, the Jakarta provincial government actually gets a loss of Rp. 18,191,984,- (million). Similar results were stated by Stjepanović, S et.al (2017) showing that the GDP growth rate and the Green GDP growth rate in 2014, differed significantly in almost all countries, both between countries in the same group and between countries in different categories of countries. We see that the difference between average GDP growth and Green GDP growth is approximately 1% to 3%, environmental quality in 2014 was sacrificed to achieve higher growth rates and the benefits of higher standard economic features, so the losses are even greater.

Table 1.1 GDP & Population Indonesia & Malaysia Performance

Tahun	INDONESIA						MALAYSIA					
	GDP	% Growth	GDP per capita	% Growth	Population	% Growth	GDP	% Growth	GDP per capita	% Growth	Population	% Growth
2010	657,835,435,591	6.22	2,720	6.03	241,834,226	5.01	232,653,672,974	7.42	8,248	-	28,208,028	6.01
2011	698,422,462,409	6.17	2,849	4.75	245,115,988	1.36	244,970,155,627	5.29	8,550	3.67	28,650,962	1.57
2012	740,537,690,665	6.03	2,981	4.61	248,451,714	1.36	258,378,484,880	5.47	8,889	3.96	29,068,189	1.46
2013	781,691,322,851	5.56	3,104	4.15	251,805,314	1.35	270,506,054,026	4.69	9,179	3.27	29,468,923	1.38
2014	820,828,015,499	5.01	3,217	3.64	255,128,076	1.32	286,754,600,538	6.01	9,601	4.60	29,866,606	1.35
2015	860,854,235,065	4.88	3,332	3.56	258,383,257	1.28	301,354,803,994	5.09	9,955	3.69	30,270,965	1.35
2016	904,181,624,279	5.03	3,457	3.76	261,556,386	1.23	314,764,434,003	4.45	10,258	3.04	30,684,652	1.37
2017	950,021,696,789	5.07	3,590	3.84	264,650,969	1.18	333,060,816,797	5.81	10,708	4.38	31,104,655	1.37
2018	999,178,589,070	5.17	3,733	3.99	267,670,549	1.14	348,947,574,702	4.77	11,068	3.36	31,528,033	1.36
2019	1,049,318,966,509	5.02	3,877	3.87	270,625,567	1.10	363,962,146,716	4.30	11,392	2.93	31,949,789	1.34
2020	1,027,602,854,053	- 2.07	3,757	- 3.11	273,523,621	1.07	343,624,871,233	- 5.59	10,617	- 6.80	32,365,998	1.30

Source : Worldbank, 2021

Table 1.1 describes GDP figures both constant and per capita. It can be seen from year to year that both Indonesia and Malaysia have increased, for Indonesia it is between 5%-6% while Malaysia is 4%-7% but during the 2020 pandemic it has decreased, for Indonesia it is 2% while Malaysia is 5%. This GDP value is also accompanied by an increase in Indonesia's population in 2020 reaching 273 million while Malaysia's 32 million. With an increase in GDP, it means that development in both countries is very good, of course this development must still pay attention to environmental elements to be sustainable.

Table 1.2 Air Pollution Rates in Indonesia & Malaysia 2010-2018

Tahun	INDONESIA		MALAYSIA	
	CO <sup>2</sup> M <sup>3</sup>	% Growth	CO <sup>2</sup> M <sup>3</sup>	% Growth
2010	4,169,400	-	1,991,100	-
2011	4,804,600	15.23	2,016,700	1.29
2012	4,867,500	1.31	2,032,800	0.80
2013	4,543,200	- 6.66	2,198,200	8.14
2014	4,900,500	7.86	2,316,800	5.40
2015	4,908,400	0.16	2,325,500	0.38
2016	4,949,800	0.84	2,286,400	- 1.68
2017	5,329,200	7.66	2,228,900	- 2.51
2018	5,831,100	9.42	2,396,200	7.51

Source : worldbank

Table 1.2 shows that one of the impacts of development is air pollution with increasing CO2 levels. Data from 2010-2018 illustrates that the value of CO2 levels in both countries is still high, especially in 2018, Indonesia experienced an increase of 9.42% while Malaysia was 7.51% even though Malaysia was able to reduce it but in 2018 it increased sharply. The increase in CO2 levels is one of the negative effects of development due to not caring about the environment. Many

problems occur due to air pollution with increasing CO2, including people who are susceptible to diseases such as Tuberculosis, Acute Respiratory Infections, which can also cause death.

Table 1.3 : Death Data due to Unclean Air Pollution & Sanitation  
in Indonesia & Malaysia in 2016

Country 2016	Mortality rate attributed to household and ambient air pollution	Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene
Indonesia	293,989	18,571
Malaysia	14,545	123

Source : worldbank

In Table 1.3 in 2016 the death rate due to air pollution for Indonesia was 293,989 people while Malaysia amounted to 14,545 people. Meanwhile, the death rate due to water pollution, namely not using good sanitation, for Indonesia is 18,571 people, while Malaysia is 123 people.

Table 1.4 : Number of Tuberculosis (TBC) patients  
in Indonesia & Malaysia 2010-2019

Tahun	INDONESIA		MALAYSIA	
	TBC	% Growth	TBC	% Growth
2010	827,073	-	21,156	-
2011	828,492	0.17	22,921	8.34
2012	832,313	0.46	24,999	9.07
2013	835,994	0.44	26,817	7.27
2014	839,371	0.40	27,776	3.58
2015	839,746	0.04	27,244	- 1.92
2016	842,212	0.29	28,844	5.87
2017	844,237	0.24	29,238	1.37
2018	845,839	0.19	29,006	- 0.80
2019	844,352	- 0.18	29,394	1.34

Source : worldbank

In Table 1.4 in 2010-2019 the number of Tuberculosis (TBC) sufferers is still high for Indonesia, ranging from 827 thousand to 845 thousand people, while Malaysia is around 21 thousand to 29 thousand people. One of the reasons a person suffers from TB is an unfavorable environment, such as air pollution so that this disease is easy to spread.

Table 1.5 Area of agricultural and forestry land  
in Indonesia & Malaysia 2010-2018

Tahun	INDONESIA					MALAYSIA				
	Land	Agriculture	% Growth	Forest	% Growth	Land	Agriculture	% Growth	Forest	% Growth
2010	1,811,570	556,000	-	996,592	-	328,550	73,893	-	189,477	-
2011	1,811,570	565,000	1.62	987,329	- 0.93	328,550	75,306	1.91	190,510	0.55
2012	1,811,570	565,000	-	978,067	- 0.94	328,550	78,292	3.97	191,543	0.54
2013	1,811,570	570,000	0.88	968,804	- 0.95	328,550	80,593	2.94	192,576	0.54
2014	1,811,570	570,000	-	959,542	- 0.96	328,550	80,890	0.37	193,609	0.54
2015	1,811,570	573,000	0.53	950,279	- 0.97	328,550	85,700	5.95	194,642	0.53
2016	1,877,519	602,000	5.06	952,718	0.26	328,550	85,710	0.01	193,146	- 0.77
2017	1,877,519	623,000	3.49	939,498	- 1.39	328,550	85,710	-	192,645	- 0.26
2018	1,877,519	623,000	-	933,443	- 0.64	328,550	85,710	-	192,143	- 0.26

Source : Worldbank, 2021

From a different perspective, the impact of development without regard to the environment is the decline in the quality of agricultural and forestry land. In both countries, Indonesia and Malaysia, although agricultural land is still increasing, if it is seen from the amount of production, it is decreasing. In Table 1.5 it can be seen that the area of forested land has decreased from year to year. For Indonesia, the decline was 0.64% to 0.97%, while Malaysia was 0.26% to 0.77%.

Table 1.6 Agricultural and fisheries products in Indonesia & Malaysia 2010-2018

Tahun	INDONESIA						MALAYSIA					
	Cereal Yield	% Growth	Cereal Production M3	% Growth	Aqua Production M3	% Growth	Cereal Yield	% Growth	Production M3	% Growth	Aqua Production M3	% Growth
2010	11,399.05	-	84,797,028	-	6,277,925	-	2,018.99	-	2,512,432	-	581,243	-
2011	11,562.94	1.44	83,400,154	- 1.65	7,937,072	26.43	1,992.12	- 1.33	2,635,830	4.91	526,693	- 9.39
2012	11,117.67	- 3.85	88,443,150	6.05	9,599,765	20.95	2,024.78	1.64	2,682,983	1.79	634,876	20.54
2013	11,208.56	0.82	89,791,565	1.52	13,301,408	38.56	2,041.36	0.82	2,690,153	0.27	530,702	- 16.41
2014	11,186.34	- 0.20	89,854,891	0.07	14,375,287	8.07	2,666.21	30.61	1,894,019	- 29.59	521,014	- 1.83
2015	10,797.87	- 3.47	95,010,276	5.74	15,649,311	8.86	2,113.85	- 20.72	2,803,864	48.04	506,965	- 2.70
2016	11,463.39	6.16	102,933,180	8.34	16,002,319	2.26	2,135.70	1.03	2,804,473	0.02	407,887	- 19.54
2017	12,024.47	4.89	110,072,609	6.94	16,118,238	0.72	2,016.33	- 5.59	2,974,455	6.06	427,516	4.81
2018	11,919.57	- 0.87	113,290,938	2.92	14,772,104	- 8.35	2,076.31	2.97	2,795,349	- 6.02	391,977	- 8.31

Source : worldbank

Table 1.6 depicts the decline in agricultural and fishery yields. For agricultural products (cereal yield) Indonesia in 2018 only increased by 0.87 even though it once reached a yield of 6.16%. Meanwhile, Malaysia in 2018 only increased by 2.97% even though it had reached 30.61%. Fishery products also appear to be declining, for Indonesia in 2018 it was 8.35% while Malaysia was 8.31%. The agricultural and fishery sectors are the mainstay sectors of the two countries, both for public consumption and for export.

Table 1.7 Figures of Net Trade in goods & services Indonesia & Malaysia in 2010-2019

Tahun	Indonesia	% Growth	Malaysia	% Growth
2010	21,212,148,896	-	40,434,591,219	-
2011	24,021,724,759	13.25	46,436,559,964	14.84
2012	- 1,884,415,529	- 107.84	33,875,653,963	- 27.05
2013	- 6,237,109,752	230.98	27,540,337,317	- 18.70
2014	- 3,027,125,054	- 51.47	31,341,554,660	13.80
2015	5,351,899,012	- 276.80	22,711,691,906	- 27.53
2016	8,234,324,960	53.86	19,990,335,309	- 11.98
2017	11,434,768,729	38.87	21,988,277,861	9.99
2018	- 6,713,373,307	- 158.71	24,054,470,763	9.40
2019	- 4,133,324,478	- 38.43	27,150,908,125	12.87

Source : worldbank

With the decline in agricultural & fishery products, in the end, exports for this sector also decreased even though this is one of the mainstay export sectors of the two countries. Table 1.7 depicts a decrease in net trade / net exports, for Indonesia in 2019 it decreased by 38.43% even though it had increased in 2017 by 38.87% while Malaysia in 2019 still increased by 12.87% even though it had increased by 14.87%.

Table 1.8 Figures of Net Capital Account  
Indonesia & Malaysia 2010-2019

Tahun	Indonesia	% Growth	Malaysia	% Growth
2010	49,845,904	-	34,369,736	-
2011	32,885,145	- 34.03	43,464,201	26.46
2012	50,565,368	53.76	78,877,148	- 281.48
2013	45,294,297	- 10.42	4,712,008	- 105.97
2014	26,573,827	- 41.33	103,323,087	- 2,292.76
2015	16,633,849	- 37.41	-309,385,283	- 399.43
2016	40,714,055	144.77	26,841,690	- 108.68
2017	46,196,678	13.47	6,379,008	- 123.77
2018	97,155,033	110.31	22,308,231	249.71
2019	39,061,579	- 59.79	79,466,472	- 456.22
2020	36,912,808	- 5.50	99,131,201	- 224.75

Source : worldbank

Adequate Capital is needed to support sustainable economic development. This capital is used to create infrastructure so that the development process runs smoothly. Table 1.8 shows that the total capital of the two countries has decreased from year to year. For Indonesia in 2020

allocated \$ 36 million, although it had allocated capital funds of \$ 97 million, while Malaysia in 2020 was minus \$ 99 million, even though it had allocated funds of \$ 103 million.

Table 1.9 Total Labor Force and Unemployment in Indonesia & Malaysia 2010-2020

Tahun	INDONESIA				MALAYSIA			
	Forces Labour	% Growth	Unemployment	% Growth	Forces Labour	% Growth	Unemployment	% Growth
2010	115,646,091	-	6,487,746	-	12,267,636	-	415,873	-
2011	117,856,119	1.91	6,069,590	- 6.45	12,826,886	4.56	391,220	- 5.93
2012	120,696,619	2.41	5,395,139	- 11.11	13,338,673	3.99	413,499	5.69
2013	121,497,604	0.66	5,272,996	- 2.26	13,944,247	4.54	440,638	6.56
2014	123,120,470	1.34	4,986,379	- 5.44	14,286,287	2.45	411,445	- 6.63
2015	124,657,269	1.25	5,622,043	12.75	14,617,015	2.32	453,127	10.13
2016	125,958,781	1.04	5,416,228	- 3.66	14,858,273	1.65	511,125	12.80
2017	129,204,841	2.58	5,013,148	- 7.44	15,154,996	2.00	516,785	1.11
2018	132,587,588	2.62	5,820,595	16.11	15,523,126	2.43	512,263	- 0.88
2019	135,802,879	2.43	4,888,904	- 16.01	15,780,716	1.66	514,451	0.43
2020	134,616,083	- 0.87	5,761,568	17.85	15,904,215	0.78	722,051	40.35

Source : worldbank

In terms of workforce, in the sustainable development process, competent and ready to compete workforce is needed. Table 1.9 shows the total workforce, for Indonesia in 2020 it will reach 134 million, of which 5.7 million are unemployed or 17%. Meanwhile, Malaysia in 2020 has a workforce of 15 million with an unemployment of 722 thousand or 40.35%. In terms of workforce, there are still many unemployed which can later hinder the process of sustainable development.

Table 1.10 Indonesia & Malaysia Gini Index 2010-2019

Tahun	Indonesia	% Growth	Malaysia	% Growth
2010	36.4	-	45.50	-
2011	39.7	9.07	43.90	- 3.52
2012	39.7	-	43.90	-
2013	40.0	0.76	41.30	- 5.92
2014	39.4	- 1.50	41.30	-
2015	39.7	0.76	41.10	- 0.48
2016	38.6	- 2.77	41.10	-
2017	38.1	- 1.30	41.10	-
2018	37.8	- 0.79	41.10	-
2019	38.2	1.06	41.10	-

Source : worldbank

Development must be felt by the whole community, marked by equitable income. In Table 1.10, the Gini index data for Indonesia ranges from 36.4 to 40.00, meaning that income is still not evenly distributed, as well as for Malaysia it is around 41.10 to 45.50, which means that the income gap is still quite large. From the explanation above, green economic growth is very necessary for sustainable development, many impacts are felt when development does not care about natural & environmental elements. This research will analyze the valuation of Green GDP and the factors that influence it, such as openness, labor forces, capital and its implications for income inequality with a comparative study of Indonesia and Malaysia. Conventionally, GDP states that trade openness affects economic growth (Purnomo, RN2018), capital affects GDP (Safari, MF, & Fikri, AAH S, 2016), labor forces affect economic growth (Purwanggono, CH, & SASANA, H. 2015), while economic growth has an effect on income disparities (Pangkiro, HA 2016). On the application of green economy to international trade in the case of the openness effect, the sign is positive for openness, but a negative sign for the square of green openness (Wang, 2011). In relation to the labour, the analysis shows that trade unions can actually promote environmental protection at the national level (Alvarez, et.al, 2019). In the short term, a green economy can increase production factors, especially by allocating capital consisting of natural capital, and human and social capital, which is aimed at improving health, education, cohesion, and stability. In the end, the idea of a green economy is expected to be able to harmonize the short and long term, and to offset the short term costs by maximizing the synergies and long term economic benefits (for example, job creation and poverty alleviation, increased efficiency) and mitigation (Hallegatte, 2012).

The novelty in this research will compare Conventional GDP and Green GDP against 2 countries, Indonesia and Malaysia, as well as provide policy implications for the government and entrepreneurs regarding the best potential for the green business / economy in the future.

## **1.2 Identification of Problems**

Based on the background of the problems that have been stated above, the problems of conventional GDP comparison Green GDP, which can be identified include the following:

1. On average there is a gap between conventional GDP and green GDP calculations of 1% to 3%, this is a loss for a country or region
2. Increasing CO<sub>2</sub> pollution, the value of CO<sub>2</sub> levels in both countries is still high, especially in 2018, Indonesia experienced an increase of 9.42% while Malaysia 7.51%
3. The impact of air pollution, increasing TB sufferers and deaths in both countries



4. The decline in the quality of forestry land, the area of forestry land has decreased from year to year. For Indonesia, the decline was 0.64% to 0.97%, while Malaysia was 0.26% to 0.77%.
5. The decline in the number of agricultural and fishery production in the two countries.
6. The decrease in the number of net trades, especially for Indonesia, although Malaysia is still good but still not as optimal as the previous year.
7. The need for capital that must be allocated temporarily from year to year is decreasing the allocation fund.
8. The number of unemployed in both countries, especially in 2020 during the covid 19 period.
9. The income gap is quite high with a Gini index of 36-45.

### **1.3 Restricting The Problem**

The increase Green GDP is influenced by many factors. This study is limited to the effect of openness, capital, and labour credit on the Green GDP and their impact on Green GDP its implications for income disparity / gap.

### **1.4. Formulation of the Problem**

Based on the limitation of the problem and the objectives of the research, the research formula is put forward as follows:

1. How does the valuation green GDP ?
2. How are the simultaneous and partial effects of openness, capital, labour on the green GDP ?
3. How does the green GDP affect the Income Disparity ?
4. What are the dominant factors among openness, capital, labour for the green GDP ?

**CHAPTER II**  
**LITERATURE REVIEW**

**2.1. Relevant Previous Research**

Relevant previous research on which the rationale for this research is based are as follows:

**Table 3.1. Previous Research**

No.	Title Year Name of Journal	Variable	Similarity Novelty	Result
1.	Economic openness and green GDP. Talberth, J., & Bohara, A. K. (2006), <i>Journal Ecological Economics</i> , Elsevier 58(4), 743-758.	Openness and green GDP	Equation: Green GDP and openness	The research find strong and robust results suggesting a negative nonlinear correlation between openness and green GDP growth and a positive nonlinear correlation between openness and growth of the gap between traditional and green GDP
2	Green GDP and Openness: Evidence from Chinese Provincial Comparable Green GDP. Wang, X. (2011). <i>Journal of Cambridge Studies</i> 1 Vol. 6 No.1 March 2011	Openness and Green GDP	Equation: Green GDP and openness	There seems to be a non-linear relationship between green GDP and Openness; it appears that openness is positively correlated with green GDP up to a point, often called threshold point and then effect reverses afterwards.
3	A study of investment, government spending, labor and economic openness to economic growth in Central Java Province. Maharani, K., & Isnowati, S. (2014). <i>Journal of Business and Economics</i> , 21(1).	1.Investment 2.Goverment spending 3.Labor 4.openness 5.economic growth	Equation: Openness Labor  Difference: Only GDP / economic growth, but does not research green	Research results Variable economic openness is statistically significant, has a negative effect on economic growth in Central Java in 1985 – 2010

No.	Title Year Name of Journal	Variable	Similarity Novelty	Result
			GDP	
4	Analysis of the influence of economic openness on economic growth (case study: ASEAN 2007-2017) Purnomo, R. N. (2018) Journal of Development Economics Dynamics	1.opennes 2.economic growth	Equation: Openness Difference: Only GDP / economic growth, but does not research green GDP	Trade openness as the first independent variable has a significant effect on economic growth in ASEAN in 2013-2017
5	Analysis of the influence of labor force and capital on economic growth in Bengkulu Province. Purba, F., & Handoko (2008). (Doctoral dissertation, Faculty of Economics UNIB).	1.labor force 2.capital 3.economic growth	Equation: Labor force capital Difference: Only GDP / economic growth, but does not research green GDP	research that Gross Domestic Fixed Capital Formation has a significant effect on economic growth in Bengkulu Province in 1990-2004
6.	The effect of capital accumulation and development of road infrastructure on economic growth and the number of poor people in East Kutai district. Marlina, I. (2015). Executive Journal 12(2).	1.capital 2.infrastructu re 3.economic growth	Equation: Capital Difference: Only GDP / economic growth, but does not research green GDP	research results that the variables of capital accumulation and road infrastructure development have a direct and significant effect on economic growth in East Kutai Regency.

No.	Title Year Name of Journal	Variable	Similarity Novelty	Result
7	Study of Investment, Government Expenditure, Manpower and Economic Openness to Economic Growth in Central Java Province. Maharani, K., & Isnowati, S. (2014). Journal of Business and Economics, 21(1).	1.investment 2.goverment expenditure 3.opennes 4.economic growth	Equation : Opennes  Difference : Only GDP / economic growth, but does not research green GDP	research results show that the labor force has a positive and significant impact on economic growth in Central Java in 1985 – 2010
8	The Influence of PAD, Labor, and Investment on Economic Growth in the Province of Bali. Karmini, N. L., & Barimbing, Y. R. (2015). E-Journal of Development Economics, Udayana University, 4(5), 44534.	1.PAD 2.Labor 3.Invesment 4.Economic Growth	Equation: Labor  Difference: Only GDP / economic growth, but does not research green GDP	research results that labor has a positive and significant effect on economic growth in Bali Province in 2015
9.	Effect of Net Exports, Labor and Investment on Indonesia's Economic Growth. Purwanggono, C. H., & SASANA, H. (2015). (Doctoral dissertation, Faculty of Economics and Business).	1.net export 2.labor 3.economic growth	Equation: Labor  Difference: Only GDP / economic growth, but does not research green GDP	research results that labor has a positive effect on Indonesia's economic growth in 1990-2012
10.	Analysis of the influence of labor force and capital on economic growth in Bengkulu province. Purba, F., & Handoko (2008) (Doctoral dissertation, Faculty of Economics, UNIB).	1.labor force 2.capital 3.economic growth	Equation: 1.labor force 2.capital  Difference: Only GDP / economic growth, but does not research green GDP	research that the labor force does not have a significant influence on the economic growth of Bengkulu Province

No.	Title Year Name of Journal	Variable	Similarity Novelty	Result
			rowth	
11.	Analysis of economic growth and poverty on the level of disparity in North Sulawesi Province. Pangkiro, H. A. (2016). Scientific Journal of Efficiency, 16(1).	1.economic growth 2.powerty 3.Income Disparity	Equation: 1.economi growth 2.income disparity Difference: Only GDP / economic growth, but does not research green GDP	research results that Economic Growth has a positive effect on Economic Disparity but is not significant in North Sulawesi Province in 2003-2013
12	Analysis of the Effect of Economic Growth, Investment, and HDI on Income Disparity Between Regions in Central Java Province in 2005-2012. Hidayat, M. H., & NUGROHO, S. (2014). (Doctoral dissertation, Faculty of Economics and Business).	1.economic growth 2.investment 3.disparity	Equation: 1.economic growth 2.income disparity Difference: Only GDP / economic growth, but does not research green GDP	the results of the study show that the regression results show that the variable economic growth has no significant effect on income inequality between regions in Central Java Province in 2005-2012

Based on theoretical studies and research conducted by a number of previous researchers, this research is a complementary follow-up study on the factors that influence the performance of Openness, capital, labour on Green GDP or Convensional GDP implication on income disparity:

**State of the Art of this reserch from Previous Research are:**

- 1) Previous research is also still using conventional GDP, so it has not used green GDP.
- 2) Comparative study of green GDP between Indonesia and Malaysia has never been studied before
- 3) In previous studies only analyzed the effect of openness on green GDP so that it has not discussed the effect of openness, capital, labor on the green GDP of Indonesia and Malaysia.

This research is a complementary research, because some of the variables used have been studied by previous researchers, but in the composition of the relationship between the variables of openness, capital, labor and GDP only that is partially. So that a novelty emerges by analyzing / valuation of green GDP with factors that influence it either partially or simultaneously, namely: openness, capital, labor.

## **2.2. Theoretical review**

### **2.2.1. Sustainable Development**

Sustainable development (Emil Salim, 1990) in (Rahadian, 2016, pp. 46-56) aims to improve people's welfare, to meet human needs and aspirations. Sustainable development is essentially aimed at seeking equal distribution of development between generations, both now and in the future. According to KLH (1990) in (Rahadian, 2016, pp.46-56) development (which is basically more economic-oriented) can be measured for its sustainability based on three criteria, namely: (1) There is no waste of natural resources. use or depletion of natural resources; (2) No pollution and other environmental impacts; (3) Activities must be able to increase the resources that can be used or resources that can be replaced.

### **2.2.2 Green GDP**

The green economy concept initiated by UNEP seems to be tasked with eradicating the myth that has been developing, namely the trade off between the economy and the environment. Cato (2009) in Siswanto et al. (2013) in Suhada and Setyawan (2016, p.21-35) states that a green economy is needed because the economic system adopted so far is full of injustice and inequality (an indicator of inequality). Although currently the green economy has become the mainstream of economic thought, so far the development of the green economy in many countries is still at the normative level or does not yet have a significant proportion in the national economic system.

The economic development model that incorporates environmental variables is known as the green economy. The calculation of environmentally friendly Gross Domestic Product (GDP), known as Green GRDP, is a serious effort to control environmental impacts.

### **2.2.2 Openness**

Suliswanto (2016, pp.33-48) An economic model that includes export and import activities is called an open economy. In this model, we will look at two new streams in the circulation of income streams, namely the flow of income received from exports, which is an injection into the

income stream, and the flow of spending on buying imported goods, which is a leak into the income stream. These two flows will affect the balance of the country's economy. Exports will increase national income in a balanced way and create economic growth. On the other hand, imports reduce national income in the balance of the country's economy (Sukirno, 2006).

### **2.2.3 Capital**

Sholikah (2017.h.15-70) Apart from land, capital accumulation is an important factor in economic growth in a country. When the stock of capital increases for a certain period of time, it is referred to as capital accumulation or capital formation. Professor Nurkse in Sholikah (2017.h.15-70) states that capital formation can occur when people do not carry out all their current activities only to meet urgent needs and desires, but also direct some of them to the manufacture of capital goods, equipment and supplies. , machinery and transportation facilities, and factories. So here capital formation can also mean investment in capital goods that can increase the capital stock, national output, and national income. Capital formation is needed to meet the increasing demand of the community in the country. Capital formation will result in an increase in national output. Investment in capital goods will not only increase production, but also employment opportunities, so this will also lead to technological progress.

### **2.2.4 Labor**

According to the Central Statistics Agency (BPS) the working age population is the population aged 15 years and over, and is distinguished as the Labor Force and not the Labor Force. Population growth every year will affect the growth of the labor force. To see its role in economic growth, it takes a productive workforce capable of producing goods and services.

### **2.2.5 Income Disparity**

Wahyuni, I. G. A. P., et.al (2014.h.458-477) Income inequality is the relative income inequality between community groups as measured by the Gini Ratio. Judging from the causes, Todaro in Suyana Utama (2009) said that the income distribution gap in developing countries was caused by: (a) High population growth resulted in a decrease in per capita income, (b) Inequality of development between regions, (c) Inflation, where income money increases but is not followed proportionally with an increase in the production of goods, (d) Investment.

## **2.3 Framework**

This study analyzes the effect of economic openness, labor, capital and investment on green economic growth and its implications for income inequality in DKI Jakarta Province, from previous research it can be explained as follows:

### **A. Effect of Economic Openness on GRDP/economic growth and Green GDP/Economic**

Several previous studies analyzed the effect of economic openness on conventional economic growth, including:

- Maharani, K., & Isnowati, S. (2014) Research results Variable economic openness is statistically significant, has a negative effect on economic growth in Central Java in 1985 – 2010
- Anggraini, S.D. (2019). The Trade Openness variable has no effect on Indonesia's economic growth in 2013-2017
- Purnomo, R. N. (2018) Trade openness as the first independent variable has a significant effect on economic growth in ASEAN in 2013-2017

From the results of previous studies, it can be concluded that there is an effect on economic openness and no effect on conventional economic growth. From the results of previous studies, this will be the basis of this research by replacing the conventional economic growth variable (brown) with the green economic growth variable, so that from these results it will be known whether economic openness has an effect on green economic growth. In terms of green gdp in the case of the openness effect, a positive sign for openness, but a negative sign for the square of green openness, this represents two opposite directional effects showing a non-linear correlation between green openness and green GDP, the first green GDP rising with an increase in openness trade to a turning point, then diminishes with green openness (Wang, 2011).

### **B. Effect of Capital on GRDP/economic growth and Green GDP/Economic**

Several previous studies analyzed the effect of capital formation on conventional/cocoa economic growth, including:

- Safari, M. F., & Fikri, A. A. H. S. (2016), research results under Capital formation variables have a positive effect on GDP (economic growth) in Indonesia 1975-2014



- The results of Purba, F., & Handoko (2008) research that Gross Domestic Fixed Capital Formation has a significant effect on economic growth in Bengkulu Province in 1990-2004
- Marlina, I. (2015), research results that the variables of capital accumulation and road infrastructure development have a direct and significant effect on economic growth in East Kutai Regency.

From the results of previous studies, it can be concluded that there is capital (capital formation) that has and does not affect conventional economic growth. From the results of previous studies this will be the basis of this research by replacing the conventional economic growth variable with the green economic growth variable, so that from these results it will be known whether capital (capital formation) has an effect on green or not. economic growth. In the short term, a green economy can increase production factors, especially by allocating capital consisting of natural capital, and human and social capital, which is aimed at improving health, education, cohesion, and stability (Hallegatte, 2012).

### **C. Labor to GDP / economic growth and Green GDP / Economic**

Several previous studies analyzed the influence of labor on conventional/cocoa economic growth, including:

- The results of Maharani, K., & Isnowati, S. (2014) research show that the labor force has a positive and significant impact on economic growth in Central Java in 1985 - 2010
- Karmini, N. L., & Barimbing, Y. R. (2015), research results that labor has a positive and significant impact on economic growth in Bali Province in 2015
- Purwanggono, C. H., & SASANA, H. (2015), research results that labor has a positive effect on Indonesia's economic growth in 1990-2012
- The results of Purba, F., & Handoko (2008) research that the labor force has no significant effect on economic growth in Bengkulu Province

From the results of previous studies, it can be concluded that there are workers who are influential and some are not influential on conventional economic growth. From the results of previous studies this will be the basis of this research by replacing the conventional economic

growth variable with the green economic growth variable, so that the results will be known whether the labor force has an effect on green economic growth. In terms of the green economy, it is shown that trade unions are negatively related to CO2 emissions per capita, even when controlling for labor conditions. These findings suggest that trade unions can promote environmental protection at the national level (Alvarez, et.al, 2019).

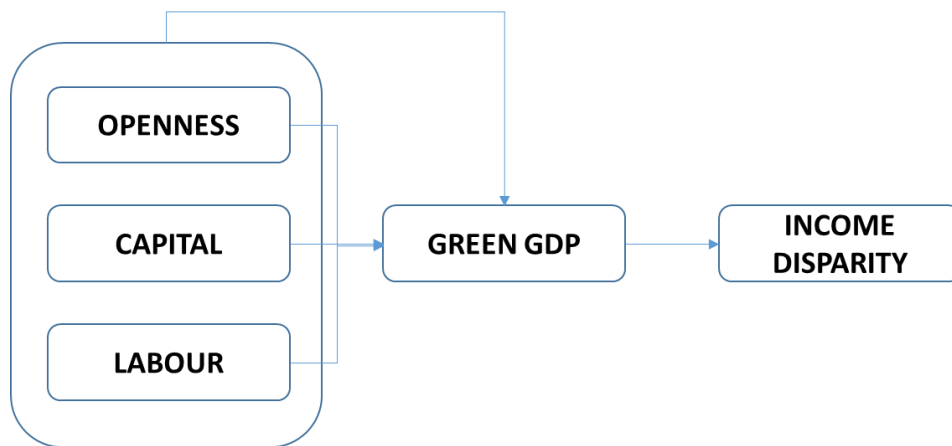
#### **d. Influence of GRDP/Economic Growth and Green GDP/Economic on Income Gap**

Several previous studies analyzed conventional/cocoa economic growth on income inequality, including:

- Pangkiro, H. A. (2016), research results that Economic Growth has a positive effect on Economic Disparity but is not significant in North Sulawesi Province in 2003-2013
- Hidayat, M. H., & NUGROHO, S. (2014), the results show that the regression results show that the variable economic growth has no significant effect on income inequality between regions in Central Java Province in 2005-2012
- Masruri, M. (2016), the results of the study showed that economic growth had a positive and significant effect on income inequality in Central Java in 2011-2014.
- Adipuryanti, N. L. P. Y., & Sudibia, I. K. (2015), research results that economic growth has a positive and significant impact on income distribution inequality in Bali Province in 2007-2013.

The factors mentioned above both partially and simultaneously need to be studied for their effects on the performance of green GDP. The theoretical scheme of the relationship between variables is depicted in the figure below. In the relation of green economic, it is found that the coastal regions perform on average better than the inland regions both economically and environmentally. For inefficient regions, the benchmark should be those regions with high cross-efficiency mean scores (e.g., Guangdong) rather than those with high self-appraisal scores (e.g., Shanghai). A cross-tabulation illustrating the difference between GDP-oriented performance and Pollution-oriented performance shows that the coastal regions make up the dominant proportion in terms of the benchmarks for economic-environmental optimization (Lu W. M., & Lo, S. F., 2007).

The following is a schematic framework for the relationship between variables in the study as shown below:



**Figure 3.1 Logical Framework**

## 2.4 Hypothesis

Based on previous research, theory and framework development, it is assumed that the increasing variable of openness, capital, labour will increase the green GDP both in Indonesia and in Malaysia.

The formulation of the research hypothesis is as follows:

1. There is a simultaneous and partial positive influence of the variables of openness, capital, labour on the Green GDP.
2. There is one of the dominant factors among the variables of openness, capital, labour on the Green GDP.
3. There is a positive influence on the green GDP on income disparity.

## **CHAPTEP III**

### **RESEARCH PURPOSE AND CONTRIBUTION**

#### 3.1 Research Purpose

The objectives of this research are:

1. Review and analyze the valuation green GDP.
2. Review and analyze the simultaneous and partial effect of openness, capital, labour on the green GDP
3. Review and analyze the green GDP affect the Income Disparity
4. Review and analyze what factors are the dominant factors among openness, capital, labour for the green GDP

#### 3.2 Contribution

This research is expected to contribute to the development of science, which can be a reference for future researchers on efforts to identify the influence of internal and external factors on the green GDP especially the effect of openness, capital, and labourcredit on the Green GDP and their impact on Green GDP its implications for income disparity / gap.

## CHAPTER IV RESEARCH METHOD

### 4.1 Research Area

The method of determining research areas and respondents was carried out purposively, namely green GDP in Indonesia and Malaysia. The study was conducted from January to December 2022.

### 4.2 Population, Sample and Research Sampling

The population in this study is all variable data studied in Indonesia. Determination of the sample in this study using purposive sampling technique, namely in accordance with the required amount. The number of samples was determined by annual data between 1990 and 2019 or a total of 30 samples, both in Indonesia and in Malaysia.

### 4.3. Method and Research Desain

The research method is quantitative survey research with the following research stages:

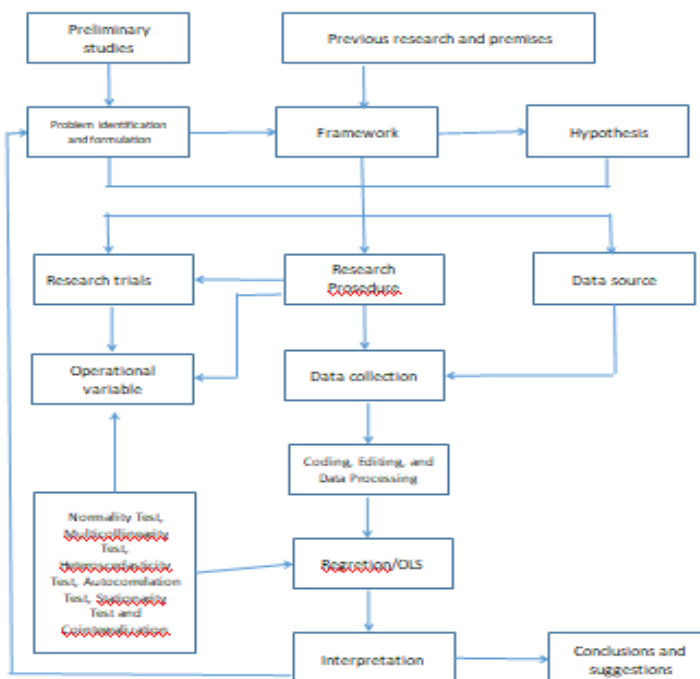


Figure 4.1. Research Stages Diagram

#### 4.4 Data and Data Collection Methods

The data collected in this research is time series secondary data. Secondary data were obtained through related agencies in this study such as BPS or worldbank.

#### 4.5 Variables and Variable Operational Definitions

In this study, the independent variables are Openness (X1), Kapital (X2), Labour (X3). Green GDP (Y) is treated as an intermediate variable, while Income Disparity (Z) is bound. To understand the interpretation, several definitions and operational limits are determined as follows:

1. Green GDP of Indonesia and Malaysia in 1990-2019.
2. Green Economy Openness is the comparison of the value of exports - imports with Green GRDP in Indonesia and Malaysia in 1990-2019.
3. Capital (Capital Formation) is the amount of capital formation in Indonesia and Malaysia in 1990-2019.
4. Manpower is the number of Labor Forces in Indonesia and Malaysia in 1990-2019.
5. Investment is the value of the ICOR value in Indonesia and Malaysia in 1990-2019.
6. Income Gap is the value of the Gini Index in Indonesia and Malaysia in 1990-2019.

#### 4.6. Data Analysis Method

##### 4.6.1. Formulation model:

Model 1.

The first model is used to determine the effect of openness, capital, labour, on the green GDP. Model 1a for Indonesia and Model 1b for Malaysian data  $Y = b_0 + b_1x_1 + b_2x_2 + b_3 x_3 + b_4 x_4 + e$

Remarks:

- Y = Green GDP
- x<sub>1</sub> = Openness
- x<sub>2</sub> = Capital
- x<sub>3</sub> = Labour
- x<sub>1</sub>...x<sub>4</sub> = Variable independent
- b<sub>1</sub>...b<sub>4</sub> = Parameter

##### Model 2.

The next model is used to determine the effect of Green GDP on Income Disparity in Indonesia (Model 2a) and for Malaysian Economic Growth (Model 2b)

$$Z1 = b_0 + b_1 \hat{y}1$$

Remarks:

Z1 = Income Disparity

$\hat{y}$  = Green GDP

## 4.6.2. Data Analysis Method

### 4.6.2.1 Valuation Green GDP

Data analysis methods that will be applied consist of:

#### (1) Valuation Semi Green GDP

According to Suparmoko (2006) in (Mulya, 2016), Semi-Green GRDP is a GRDP that includes elements of natural resource and environmental depletion. Mathematically, can be expressed as follows:

Semi-Green GRDP is obtained by subtracting the depletion value of natural resources from the value of Conventional GRDP (or Brown GRDP). Depletion value is obtained by multiplying the volume of extraction of each type of natural resource by unit rent or unit price.

$$D = Q \times U$$

Where:

D = depletion value

Q = volume of natural resources taken

U = unit rent

How to calculate unit rent is by subtracting the cost of taking per unit from the price of natural resources including the value of profit per unit (remuneration for investment expenses) that is acceptable to investors. The proper profit value is the same as the interest rate on loans in banks as an alternative cost of capital invested to exploit natural resources in the area concerned. Here's how to calculate unit rent.

#### (2) Valuation Green GDP

To get the value of Green GRDP, the value of environmental damage or degradation is reduced by the value of Semi Green GRDP, so that the value of Green GRDP is obtained. Calculating environmental damage is more complex because it is necessary to use various estimates according to the type of natural resource and degraded environment. The calculation steps in assessing environmental damage are as follows (Ratnaningsih, 2012) in (Mulya, 2016):

(a) Identification of the degraded environment

(b) Physical quantification of environmental degradation

(c) Economic assessment of environmental damage.

**4.6.2.2.** The data analysis method in this study uses OLS multiple linear regression to determine the effect of the dependent variable on the independent variable in each model for both Indonesian and Malaysian green GDP data with the analysis stages:

a. Stationarity Test

To test whether the time series data is stationary and does not contain spurious regression, the unit root testing stage is carried out using the Augmented Dicky Fuller (ADF) method (Gujarati, 2012).

b. Classic Assumption

1) Multicollinearity Test

a. Multicollinearity test is shown to test whether in the regression model there is a correlation between the independent variables (independent variables). A good regression test model is one that does not occur multicollinearity. According to Sarjono and Julianita (2011) to detect the presence or absence of multicollinearity:

- i. The  $R^2$  value generated by an empirical regression model estimate is very high but individually the dependent variable.
- ii. Analyzing the correlation between the independent variables, if there is a high enough correlation between the independent variables (greater than 0.90), it indicates that there is multiolinerity.

2. Multicollinearity can also be seen from the VIF

(Variance-inflating factor) value, if  $VIF < 10$  the level of collinearity can be tolerated.

2) Heteroscedasticity Test

According to Wijaya (2010), heteroscedasticity shows that variable variance is not the same for all observations. If the residual variance from one observation to another is constant, it is called homoscedasticity. A good regression model is one that includes homoscedasticity or does not occur heteroscedasticity.

3) Autocorrelation Test

Testing the presence or absence of autocorrelation by looking at the Breusch-Godfrey LM test. The hypothesis testing is based on the null hypothesis of no autocorrelation or serial correlation exist.

4) RAMSEY RESET Test



RAMSEY reset test is a test to ensure that there is no misspecification error in the model. The null hypothesis for this test is the model has no omitted variables.

#### **d. Hypothesis testing**

Determination Test ( $R^2$ )

To find out how far the influencing variables explain the affected variables using the determination test ( $R^2$ ). The input of credit, investment, technology and cooperative factors will be more closely related to the green GDP if the  $R^2$  value is equal to or close to one.

$$R^2 = ESS / TSS$$

Where:

ESS = Explained sum of square (Sum of Squares Regression)

TSS = Total Sum of square

#### **F test**

The F test is used to examine whether the use of several variables together affects the SME business.

$$F = (ESS / (k-1)) / (TSS / (N-1))$$

Where:

ESS = Explained sum of square (Sum of Squares Regression); TSS = Total Sum of square; k = number of variables, N = number of samples. With the hypothesis:

$$H_0: b_i = 0$$

$$H_1: \text{at least one } b_i \neq 0$$

With a significant level of  $\alpha = 5\%$ :

#### **t test**

The t test is used to determine the effect of each of the openness, capital, labour on the green GDP

$$t_{hit} = \beta_i / (Se(\beta_i)); \text{ where } Se(\beta_i) = \sqrt{[Se] \wedge 2 / (\sum 1 \wedge 2 (1-r))}$$

Information:

$B_i$  = regression coefficient  $\mu_1, \mu_2, \mu_3, \mu_4$  and  $\mu_5$ ;  $Se(\beta_i)$  = standard error  $\mu_1, \mu_2, \mu_3, \mu_4$  and  $\mu_5$

#### **4.6.2.3. t-test Different test**

Different test independent sample t-test is to test two groups that have the same variant. This test is used to test the differences in the green GDP of Indonesian and the green GDP of Malaysian (Pramana, 2012; idtesis.com, 2019, Resmi et.al., 2020).

**CHAPTER V**  
**IMPLEMENTATION OF RESEARCH COLLABORATION**

<b>UMB</b>	<b>Association/BPS</b>	<b>International Partner</b>
1. Coordinating research planning 2. Compiling a research proposal 3. Coordinating the implementation of research, Carry out research in the field 4. Coordinating the publication of research results. Processing data & Prepare published article	As a source of primary data about Green GDP, Openness, Capital, Labour, Income Disparity	1. Provide research data 2. Analyze the data 3. Compile articles together for publication

## CHAPTER VI

### RESULT AND DISCUSSION

#### 6.1. Profile of Indonesia & Malaysia

##### A. Profile of Indonesia



Figure 6.1 : Indonesia Map and others Country in ASIA

Astronomically, Indonesia is located between 60 04' 30" North Latitude and 110 00' 36" South Latitude and between 940 58' 21" to 1410 01' 10" East Longitude and is traversed by the equator or the equator which passes is located at latitude 00.

Based on its geographical position, the state of Indonesia has the following boundaries:

- North–Countries of Malaysia, Singapore, Vietnam, Philippines, Thailand, Palau and South China Sea;
- South–Countries of Australia, Timor Leste, and the Indian Ocean;
- West–Indian Ocean; East–Papua New Guinea and the Pacific Ocean.

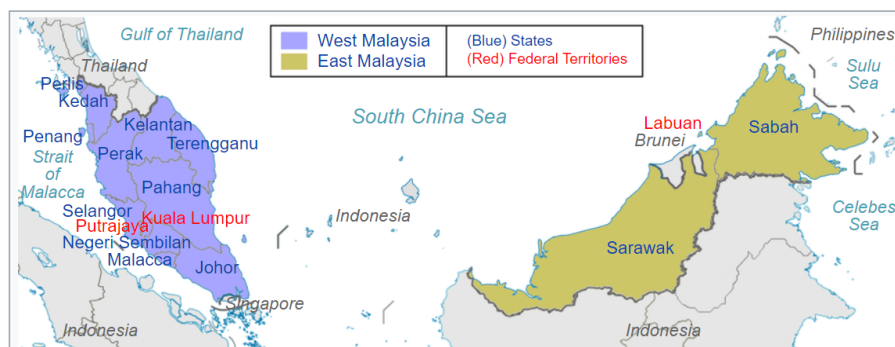
These boundaries exist in the 111 outer islands that need to be maintained and managed properly. These islands are used to determine the baseline for Indonesia's territorial boundaries with other countries (Presidential Decree Number 6 of 2017 concerning Designation of Outermost Small Islands). Based on its geographical location, the Indonesian archipelago is located between the

continents of Asia and the continents of Australia, as well as between the Indian Ocean and the Pacific Ocean. Indonesia consists of 34 provinces located on five major islands and four archipelagos, namely:

- Sumatra Island: Aceh, North Sumatra, West Sumatra, Riau, Jambi, South Sumatra, Bengkulu and Lampung.
- Riau Islands: Riau Islands.
- Bangka Belitung Islands: Bangka Belitung Islands.
- Java Island: DKI Jakarta, West Java, Banten, Central Java, DI Yogyakarta, and East Java.
- Nusa Tenggara Islands (Sunda Minor): Bali, West Nusa Tenggara, and East Nusa Tenggara.
- Kalimantan Island: West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan and North Kalimantan.
- Sulawesi Island: North Sulawesi, Gorontalo, Central Sulawesi, South Sulawesi, West Sulawesi and Southeast Sulawesi.
- Maluku Islands: Maluku and North Maluku.
- Papua Island: Papua and West Papua.

As an archipelagic country, Indonesia has thousands of islands and is connected by various straits and seas. Currently, there are 13,466 islands that are coordinated and registered with the United Nations (2012).

## B. Profile of Malaysia



Malaysia is located in Southeast Asia region. The federal constitutional monarchy has two regions, separated by the South China Sea; Peninsular Malaysia and Borneo's East Malaysia. Malaysia is a federation of 13 states (Negeri) and 3 federal territories (Wilayah Persekutuan) as stated below:

1. 13 states are Johor, Melaka, Negeri Sembilan, Kedah, Perlis, Pulau Pinang, Kelantan, Pahang, Perak, Selangor and Terengganu, Sabah and Sarawak.
2. 3 federal territories are Wilayah Persekutuan Kuala Lumpur, Labuan dan Putrajaya.

The country's combined area of 329,847 km<sup>2</sup>, making it slightly larger than Norway or somewhat larger than the U.S. state of New Mexico. The highest mountain is Mount Kinabalu (4,095 m) in Sabah state on the island of Borneo. Mt. Kinabalu and surrounding Kinabalu Park official website are a UNESCO World Heritage Site.

Malaysia has a population of about 33 million people (in 2021). The largest city and national capital is Kuala Lumpur. Spoken languages are Malay (official), English, Tamil, and Chinese (Cantonese). Malaysia's official religion is Islam; about 60 % of the population are Muslim, 20% are Buddhist.

Malaysia's population is a mix of three major ethnic groups, each with its own heritage, culture and tradition. 60% of the population are Bumiputera, a term that describes the traditional inhabitants of the country and includes Malays, Orang Asli and other indigenous peoples. Minorities are Chinese, about 20%, and Indians (6%). Malaysia has more than 130 living languages; the official language is Bahasa Malaysia (Melayu).

## 6.2 Overview of Research Operational Variables

### 6.2.1. Economic Growth Variables

**Table 6.1**  
**GDP Indonesia & Malaysia**  
**1990 – 2019**

Year	Indonesia	% Growth	Malaysia	% Growth
1990	269,915,109,658.49	7.24	74,627,439,029.62	9.01
1991	288,571,595,709.62	6.91	81,750,976,904.37	9.55
1992	307,321,553,946.56	6.50	89,014,647,650.75	8.89
1993	327,286,416,333.05	6.50	97,822,596,594.55	9.89
1994	351,963,717,524.10	7.54	106,834,055,076.18	9.21
1995	380,895,161,146.50	8.22	117,334,865,369.35	9.83
1996	410,674,257,411.07	7.82	129,071,520,752.79	10.00
1997	429,975,449,993.56	4.70	138,523,095,019.84	7.32
1998	373,533,752,988.27	- 13.13	128,328,605,325.82	- 7.36
1999	376,488,875,933.23	0.79	136,204,917,219.31	6.14
2000	395,012,383,689.13	4.92	148,271,131,276.41	8.86
2001	409,404,527,351.18	3.64	149,038,694,328.51	0.52
2002	427,825,583,308.41	4.50	157,073,352,912.56	5.39
2003	448,277,225,387.51	4.78	166,165,542,824.22	5.79
2004	470,829,487,520.98	5.03	177,437,278,939.96	6.78
2005	497,631,791,817.58	5.69	186,898,481,577.26	5.33
2006	525,006,276,753.31	5.50	197,336,475,944.18	5.58
2007	558,318,041,704.74	6.35	209,766,278,120.60	6.30
2008	591,893,633,878.69	6.01	219,901,701,984.38	4.83
2009	619,291,627,728.72	4.63	216,573,426,577.90	- 1.51
2010	657,835,435,591.37	6.22	232,653,672,974.01	7.42
2011	698,422,462,409.20	6.17	244,970,155,626.68	5.29
2012	740,537,690,664.80	6.03	258,378,484,880.30	5.47
2013	781,691,322,850.81	5.56	270,506,054,026.37	4.69
2014	820,828,015,498.85	5.01	286,754,600,537.70	6.01
2015	860,854,235,065.08	4.88	301,354,803,994.37	5.09
2016	904,181,624,278.98	5.03	314,764,434,003.33	4.45
2017	950,021,696,789.27	5.07	333,060,816,796.83	5.81
2018	999,178,589,070.13	5.17	348,947,574,702.34	4.77
2019	1,049,318,966,508.58	5.02	363,962,146,716.17	4.30

Source : World Bank

Seen from Table 6.1, it states that Indonesia & Malaysia's economic growth from 1990 to 2019, for Indonesia the highest economic growth was in 1998 at 13.13% while the lowest was in 1999 at 0.79%. For Malaysia, the highest economic growth was in 1996 at 10%, while the lowest was in 2001 at 0.52%.

## 6.2.2. Variabel Opennes

**Table 6.2**  
**Net Trade Indonesia & Malaysia**  
**Tahun 1990 – 2019**

Tahun	Indonesia	% Growth	Malaysia	% Growth
1990	1,784,000,000	-	899,856,740	-
1991	1,059,000,000	- 40.64	1,798,865,482	- 299.91
1992	2,313,000,000	118.41	803,569,676	- 144.67
1993	2,344,000,000	1.34	67,596,573	- 108.41
1994	1,282,000,000	- 45.31	1,154,993,732	1,608.66
1995	1,538,000,000	- 219.97	3,482,664,706	201.53
1996	2,592,000,000	68.53	1,411,002,040	- 140.52
1997	409,000,000	- 115.78	940,213,222	- 33.37
1998	10,819,614,427	2,545.38	15,895,015,130	1,590.58
1999	12,865,957,537	18.91	19,828,236,842	24.75
2000	14,619,057,987	13.63	18,019,763,158	- 9.12
2001	12,316,401,091	- 15.75	16,181,578,947	- 10.20
2002	13,131,270,332	6.62	16,565,236,842	2.37
2003	12,455,540,664	- 5.15	21,756,552,632	31.34
2004	11,341,399,488	- 8.94	25,414,723,684	16.81
2005	8,411,220,328	- 25.84	30,775,516,791	21.09
2006	19,786,001,791	135.23	35,471,715,594	15.26
2007	20,911,715,981	5.69	38,520,460,700	8.59
2008	9,917,758,527	- 52.57	51,312,688,998	33.21
2009	21,191,036,278	113.67	41,550,972,363	- 19.02
2010	21,212,148,896	0.10	40,434,591,219	- 2.69
2011	24,021,724,759	13.25	46,436,559,964	14.84
2012	1,884,415,529	- 107.84	33,875,653,963	- 27.05
2013	6,237,109,752	230.98	27,540,337,317	- 18.70
2014	3,027,125,054	- 51.47	31,341,554,660	13.80
2015	5,351,899,012	- 276.80	22,711,691,906	- 27.53
2016	8,234,324,960	53.86	19,990,335,309	- 11.98
2017	11,434,768,729	38.87	21,988,277,861	9.99
2018	6,713,373,307	- 158.71	24,054,470,763	9.40
2019	4,133,324,478	- 38.43	27,150,908,125	12.87

Source : World Bank

Viewed from Table 6.2, it states that Indonesia & Malaysia Net Trade from 1990 to 2019, for Indonesia the highest Net Trade was in 2009 at 113.67% while the lowest was in 1995 at -219%. For Malaysia, the highest Net Trade was in 2008 at 33.21%, while the lowest was in 1994 at -1.608%. Meanwhile, the economic crisis in 1998 caused a high increase in net trade in the two countries.

**Table 6.3**  
**Green Openness Indonesia & Malaysia**  
**1990 – 2019**

Year	Indonesia	% Growth	Malaysia	% Growth
1990	0.11	-	0.17	-
1991	0.05	- 56.26	0.21	- 220.10
1992	0.13	166.26	0.11	- 153.33
1993	0.11	- 10.36	0.01	- 106.75
1994	0.05	- 54.93	0.13	1,570.48
1995	0.06	- 208.02	0.34	171.05
1996	0.09	65.90	0.13	- 137.80
1997	0.02	- 122.21	0.10	- 22.75
1998	0.20	- 1,052.34	1.77	- 1,871.14
1999	3.48	- 1,873.91	2.75	- 255.37
2000	0.96	- 72.41	1.81	- 34.03
2001	0.82	- 14.36	8.46	366.94
2002	0.67	- 18.34	2.18	- 74.26
2003	0.63	- 6.02	2.74	25.80
2004	0.64	1.68	3.01	9.82
2005	0.40	- 38.01	4.65	54.42
2006	0.75	88.24	3.79	- 18.36
2007	0.71	- 5.51	3.12	- 17.81
2008	0.38	- 46.98	7.47	139.75
2009	0.57	51.38	33.10	342.96
2010	0.63	11.40	2.64	- 92.04
2011	0.81	28.32	4.96	88.25
2012	0.04	- 105.07	2.92	- 41.11
2013	0.14	- 251.78	2.17	- 25.63
2014	0.07	- 53.11	1.90	- 12.48
2015	0.10	- 254.52	1.32	- 30.65
2016	0.18	71.94	1.14	- 13.41
2017	0.27	49.55	1.33	16.66
2018	0.17	- 163.83	2.46	84.33
2019	0.07	- 57.34	1.51	- 38.46

Viewed from Table 6.3, it is stated that the Green Openness of Indonesia & Malaysia from 1990 to 2019, for Indonesia the highest Green Openness was in 2009 at 51.38% while the lowest was in 1995 at -208%. For Malaysia, the highest Green Openness was in 2008 at 139.75%, while the lowest was in 1994 at -1.570%. Meanwhile, the economic crisis in 1998 caused green openness in both countries to decrease.



### 6.2.3. Variabel Labor Force

**Table 6.4**  
**Labor Force Indonesia & Malaysia**  
**1990 – 2019**

Year	Indonesia	% Growth	Malaysia	% Growth
1990	76,019,658	-	7,085,842	-
1991	77,540,403	2.00	7,297,079	2.98
1992	79,955,822	3.12	7,507,351	2.88
1993	80,985,420	1.29	7,715,590	2.77
1994	84,657,744	4.53	7,930,325	2.78
1995	86,837,592	2.57	8,153,108	2.81
1996	88,974,409	2.46	8,395,719	2.98
1997	90,461,719	1.67	8,655,651	3.10
1998	93,520,509	3.38	8,982,169	3.77
1999	95,875,721	2.52	9,263,640	3.13
2000	98,570,552	2.81	9,538,842	2.97
2001	98,977,592	0.41	9,801,296	2.75
2002	98,795,437	- 0.18	10,062,825	2.67
2003	99,698,352	0.91	10,339,409	2.75
2004	101,661,440	1.97	10,623,366	2.75
2005	101,406,835	- 0.25	10,923,974	2.83
2006	103,518,192	2.08	11,178,607	2.33
2007	108,975,289	5.27	11,444,489	2.38
2008	111,341,189	2.17	11,635,135	1.67
2009	113,074,389	1.56	11,983,964	3.00
2010	115,646,091	2.27	12,267,636	2.37
2011	117,856,119	1.91	12,826,886	4.56
2012	120,696,619	2.41	13,338,673	3.99
2013	121,497,604	0.66	13,944,247	4.54
2014	123,120,470	1.34	14,286,287	2.45
2015	124,657,269	1.25	14,617,015	2.32
2016	125,958,781	1.04	14,858,273	1.65
2017	129,204,841	2.58	15,154,996	2.00
2018	132,587,588	2.62	15,523,126	2.43
2019	135,802,879	2.43	15,780,716	1.66

Source : World Bank

Viewed from Table 6.4, it states that the Indonesian & Malaysian Labor Force from 1990 to 2019, for Indonesia Labor Force was the highest in 2007 at 5.27% while the lowest in 2005 was -0.25%. For Malaysia Labor Force, the highest was in 2011 at 4.56%, while the lowest was in 2016 at 1.65%.

## 6.2.4. Variabel Gross Capital

**Table 6.5**  
**Gross Capital Indonesia & Malaysia**  
**1990 – 2019**

Year	Indonesia	% Growth	Malaysia	% Growth
1990	88,282,997,572.19	-	24,149,682,678.23	-
1991	91,966,109,659.86	4.17	30,894,081,618.69	27.93
1992	92,736,821,493.47	0.84	31,477,850,705.92	1.89
1993	92,558,801,542.65	-	38,330,523,928.98	21.77
1994	104,078,091,896.83	12.45	44,017,854,157.63	14.84
1995	115,905,677,981.62	11.36	51,204,820,693.36	16.33
1996	129,782,759,872.48	11.97	53,537,832,331.55	4.56
1997	130,315,565,352.80	0.41	59,527,644,970.72	11.19
1998	102,458,465,678.40	-	34,231,623,642.57	-
1999	83,349,966,078.62	-	30,485,385,260.38	-
2000	87,873,257,717.60	5.43	39,836,730,105.99	30.67
2001	92,276,776,729.72	5.01	36,362,788,487.75	-
2002	91,572,088,217.05	-	38,918,603,646.14	-
2003	114,752,238,310.02	25.31	37,824,902,357.29	-
2004	113,264,466,518.51	-	40,898,520,235.62	-
2005	124,813,069,692.34	10.20	41,858,564,813.48	2.35
2006	133,352,735,104.34	6.84	44,802,334,617.14	7.03
2007	139,134,440,771.47	4.34	49,105,310,241.56	9.60
2008	164,642,580,852.31	18.33	47,187,176,551.25	-
2009	191,888,702,455.53	16.55	38,627,375,722.47	-
2010	216,297,090,185.65	12.72	54,409,646,845.24	40.86
2011	230,369,992,558.89	6.51	56,804,311,626.12	4.40
2012	259,718,369,405.41	12.74	66,528,897,765.77	17.12
2013	264,456,780,413.73	1.82	70,161,443,851.86	5.46
2014	284,009,316,313.11	7.39	71,624,441,266.65	2.09
2015	293,230,989,065.86	3.25	76,617,238,765.84	6.97
2016	306,144,498,998.82	4.40	81,824,626,211.18	6.80
2017	320,257,964,676.58	4.61	85,088,190,769.52	3.99
2018	345,421,891,749.16	7.86	83,389,639,166.97	-
2019	354,464,179,588.67	2.62	76,591,530,508.89	-

Source : World Bank

Viewed from Table 6.5 it states that Indonesia & Malaysia's Gross Capital from 1990 to 2019, for Indonesia the highest Gross Capital was in 1999 at 18.65% while the lowest was in 1993 at 0.19%. For Malaysia, the highest Gross Capital was in 2010 at 40.86%, while the lowest was in 1992 at 1.89%.

### 6.2.5. Variabel Disparity (GINI Index)

**Table 6.6**  
**Dispariity (GINI Index) Indonesia & Malaysia**  
**1990 – 2019**

Year	Indonesia	% Growth	Malaysia	% Growth
1990	31.20	-	46.20	-
1991	31.20	-	46.20	-
1992	31.20	-	47.70	3.25
1993	32.00	2.56	47.70	-
1994	32.00	-	47.70	-
1995	32.00	-	48.50	1.68
1996	34.50	7.81	48.50	-
1997	34.50	-	49.10	1.24
1998	31.10	- 9.86	49.10	-
1999	31.10	-	49.10	-
2000	28.60	- 8.04	49.10	-
2001	29.00	1.40	49.10	-
2002	31.70	9.31	49.10	-
2003	31.90	0.63	46.40	- 5.50
2004	32.70	2.51	46.40	-
2005	33.00	0.92	46.40	-
2006	34.30	3.94	44.80	- 3.45
2007	35.70	4.08	44.80	-
2008	35.20	- 1.40	45.50	1.56
2009	35.10	- 0.28	45.50	-
2010	36.40	3.70	45.50	-
2011	39.70	9.07	43.90	- 3.52
2012	39.70	-	43.90	-
2013	40.00	0.76	41.30	- 5.92
2014	39.40	- 1.50	41.30	-
2015	39.70	0.76	41.10	- 0.48
2016	38.60	- 2.77	41.10	-
2017	38.10	- 1.30	41.10	-
2018	37.80	- 0.79	41.10	-
2019	38.20	1.06	41.10	-

Source : World Bank

Viewed from Table 6.6, it states that the Disparity (GINI Index) of Indonesia & Malaysia from 1990 to 2019, for Indonesia the highest GINI Index was in 2014 at 39.70 while the lowest in 1998 was 31.10. For Malaysia, the highest GINI Index was in 1995 at 48.50%, while the lowest was in 2015 at 41.10.

## 6.3 Analysis Data

### 6.3.1. Green GDP Valuation

#### A. Depletion Natural Source

**Table 6.7**  
**Depletion Natural Source (%) Indonesia & Malaysia**  
**1990 – 2019**

Tahun	Indonesia	% Growth	Malaysia	% Growth
1990	8.33	21.93	8.51	26.12
1991	4.53	- 45.55	4.69	- 44.95
1992	4.68	3.24	4.19	- 10.53
1993	3.79	- 19.02	3.41	- 18.63
1994	3.19	- 15.83	2.78	- 18.55
1995	3.43	7.35	2.78	0.14
1996	3.91	14.00	3.30	18.70
1997	3.56	- 8.72	3.17	- 4.14
1998	4.91	37.79	2.43	- 23.40
1999	4.98	1.47	3.41	40.40
2000	7.52	50.86	5.89	73.00
2001	5.59	- 25.60	4.26	- 27.76
2002	4.37	- 21.91	4.37	2.68
2003	4.14	- 5.16	5.02	14.91
2004	5.43	31.03	6.69	33.15
2005	6.79	25.08	7.99	19.53
2006	6.22	- 8.35	7.78	- 2.65
2007	6.31	1.34	6.76	- 13.10
2008	6.70	6.16	7.45	10.25
2009	4.03	- 39.84	5.06	- 32.13
2010	4.20	4.18	4.89	- 3.26
2011	4.97	18.43	5.54	13.16
2012	3.71	- 25.35	5.47	- 1.30
2013	3.31	- 10.82	4.89	- 10.48
2014	2.77	- 16.15	4.63	- 5.39
2015	1.65	- 40.49	3.96	- 14.56
2016	1.38	- 16.18	2.79	- 29.39
2017	1.69	21.88	3.39	21.42
2018	2.52	49.53	4.94	45.70
2019	1.80	- 28.43	3.79	- 23.24

Source : World Bank

Viewed from Table 6.7, it states that Indonesia & Malaysia Natural Source Depletion from 1990 to 2019, for Indonesia the highest Natural Source Depletion was in 2000 at 7.52% while the lowest in 2016 was 1.38%. For Malaysia, the highest Natural Source Depletion was in 2005 at 7.99%, while the lowest was in 1994 at 2.79%.

## B. Depletion Total

**Table 6.8**  
**Depletion Natural Source Indonesia & Malaysia**  
**1990 – 2019**

Year	Indonesia	% Growth	Malaysia	% Growth
1990	8,459,310,632.23	31.15	3,683,290,602.49	37.76
1991	5,105,524,735.97	- 39.65	2,221,777,664.95	- 39.68
1992	5,800,303,574.35	13.61	2,294,635,102.72	3.28
1993	5,353,881,247.39	- 7.70	2,147,122,968.71	- 6.43
1994	5,259,458,659.15	- 1.76	1,998,406,120.07	- 6.93
1995	6,678,466,899.15	26.98	2,308,910,860.51	15.54
1996	8,509,026,135.28	27.41	3,123,853,466.80	35.30
1997	7,953,134,313.55	- 6.53	3,154,007,002.25	0.97
1998	6,669,332,237.96	- 16.14	1,952,328,622.02	- 38.10
1999	5,926,879,893.98	- 11.13	2,608,142,625.67	33.59
2000	9,224,503,229.71	55.64	4,727,593,052.55	81.26
2001	8,637,248,551.24	- 6.37	3,582,014,426.74	- 24.23
2002	7,501,986,562.59	- 13.14	4,009,534,536.30	11.94
2003	8,215,210,864.99	9.51	5,159,766,669.49	28.69
2004	13,091,411,660.69	59.36	7,983,737,616.65	54.73
2005	18,746,720,696.53	43.20	10,820,340,996.07	35.53
2006	19,693,986,717.14	5.05	11,905,649,956.05	10.03
2007	23,447,606,517.67	19.06	11,977,873,755.74	0.61
2008	30,583,689,195.74	30.43	15,247,092,123.70	27.29
2009	20,662,276,543.38	- 32.44	10,663,809,705.85	- 30.06
2010	25,671,147,149.12	24.24	11,403,081,632.48	6.93
2011	36,660,959,425.50	42.81	14,360,455,926.64	25.93
2012	32,993,197,418.01	- 10.00	16,176,001,741.44	12.64
2013	31,070,613,970.49	- 5.83	15,631,346,679.06	- 3.37
2014	25,619,286,706.24	- 17.54	15,402,998,508.26	- 1.46
2015	14,629,063,869.74	- 42.90	12,787,041,109.23	- 16.98
2016	12,304,364,756.40	- 15.89	8,697,536,060.23	- 31.98
2017	15,754,041,486.69	28.04	10,494,380,055.76	20.66
2018	25,917,494,078.71	64.51	16,588,686,412.93	58.07
2019	19,780,425,402.90	- 23.68	13,643,424,767.41	- 17.75

Viewed from Table 6.8, it states that Indonesia & Malaysia's Total Depletion from 1990 to 2019, Total Depletion is obtained from per capita depletion multiplied by population, while per capita depletion is obtained from % natural source depletion multiplied by GNI. For Indonesia, the highest Total Depletion was in 2018 at 64.51% while the lowest was in 2015 at -42.90%. For Malaysia, the highest total depletion was in 2000 at 81.26%, while the lowest was in 1991 at -39.68%.

## C. Semi Green GDP

**Table 6.9**  
**Semi Green GDP Indonesia & Malaysia**  
**1990-2019**

Year	Indonesia	% Growth	Malaysia	% Growth
1990	261,455,799,026.26	6.61	70,944,148,427.13	7.84
1991	283,466,070,973.64	8.42	79,529,199,239.42	12.10
1992	301,521,250,372.21	6.37	86,720,012,548.03	9.04
1993	321,932,535,085.66	6.77	95,675,473,625.83	10.33
1994	346,704,258,864.96	7.69	104,835,648,956.11	9.57
1995	374,216,694,247.36	7.94	115,025,954,508.85	9.72
1996	402,165,231,275.79	7.47	125,947,667,285.98	9.49
1997	422,022,315,680.00	4.94	135,369,088,017.59	7.48
1998	366,864,420,750.31	- 13.07	126,376,276,703.80	- 6.64
1999	370,561,996,039.25	1.01	133,596,774,593.64	5.71
2000	385,787,880,459.41	4.11	143,543,538,223.85	7.45
2001	400,767,278,799.94	3.88	145,456,679,901.77	1.33
2002	420,323,596,745.82	4.88	153,063,818,376.26	5.23
2003	440,062,014,522.52	4.70	161,005,776,154.73	5.19
2004	457,738,075,860.29	4.02	169,453,541,323.30	5.25
2005	478,885,071,121.06	4.62	176,078,140,581.19	3.91
2006	505,312,290,036.17	5.52	185,430,825,988.14	5.31
2007	534,870,435,187.07	5.85	197,788,404,364.86	6.66
2008	561,309,944,682.95	4.94	204,654,609,860.68	3.47
2009	598,629,351,185.34	6.65	205,909,616,872.06	0.61
2010	632,164,288,442.24	5.60	221,250,591,341.53	7.45
2011	661,761,502,983.70	4.68	230,609,699,700.04	4.23
2012	707,544,493,246.79	6.92	242,202,483,138.85	5.03
2013	750,620,708,880.32	6.09	254,874,707,347.31	5.23
2014	795,208,728,792.61	5.94	271,351,602,029.45	6.46
2015	846,225,171,195.34	6.42	288,567,762,885.14	6.34
2016	891,877,259,522.58	5.39	306,066,897,943.10	6.06
2017	934,267,655,302.58	4.75	322,566,436,741.06	5.39
2018	973,261,094,991.42	4.17	332,358,888,289.42	3.04
2019	1,029,538,541,105.68	5.78	350,318,721,948.76	5.40

Seen from Table 6.9, it states that Indonesia & Malaysia's Semi Green GDP from 1990 to 2019, Semi Green GDP is obtained from Conventional GDP (Brown GDP) minus the total depletion. For Indonesia, the highest semi-green GDP was in 1991 at 8.42%, while the lowest was in 1998 at - 13.07%. For Malaysia, the highest semi-green GDP was in 1991 at 12.10%, while the lowest was in 1998 at -6.64%.

**D. Total CO<sup>2</sup>M<sup>3</sup>**

**Table 6.10**  
**Total CO<sup>2</sup>M<sup>3</sup> Indonesia & Malaysia 1990 – 2019**

Year	Indonesia	% Growth	Malaysia	% Growth
1990	1,479,900	13.00	561,900	12.65
1991	1,618,400	9.36	633,300	12.71
1992	1,709,100	5.60	688,700	8.75
1993	1,854,800	8.52	711,900	3.37
1994	1,969,300	6.17	770,000	8.16
1995	2,228,400	13.16	838,800	8.94
1996	2,344,800	5.22	957,100	14.10
1997	2,576,700	9.89	1,025,000	7.09
1998	2,611,400	1.35	1,030,400	0.53
1999	2,789,900	6.84	1,118,200	8.52
2000	2,801,700	0.42	1,216,500	8.79
2001	3,018,300	7.73	1,267,700	4.21
2002	3,060,600	1.40	1,363,300	7.54
2003	3,353,700	9.58	1,438,100	5.49
2004	3,431,600	2.32	1,574,700	9.50
2005	3,444,000	0.36	1,664,100	5.68
2006	3,641,000	5.72	1,726,800	3.77
2007	3,799,800	4.36	1,883,400	9.07
2008	3,771,800	- 0.74	2,011,300	6.79
2009	3,944,900	4.59	1,810,200	- 10.00
2010	4,169,400	5.69	1,991,100	9.99
2011	4,804,600	15.23	2,016,700	1.29
2012	4,867,500	1.31	2,032,800	0.80
2013	4,543,200	- 6.66	2,198,200	8.14
2014	4,900,500	7.86	2,316,800	5.40
2015	4,908,400	0.16	2,325,500	0.38
2016	4,949,800	0.84	2,286,400	- 1.68
2017	5,329,200	7.66	2,228,900	- 2.51
2018	5,831,100	9.42	2,396,200	7.51
2019	6,467,951	10.92	2,607,103	8.80

Viewed from Table 6.10 it states that the Total CO<sup>2</sup>M<sup>3</sup> of Indonesia & Malaysia from 1990 to 2019, this Total CO<sup>2</sup>M<sup>3</sup> is an indicator of air pollution which is calculated per capita. For Indonesia, the highest Total CO<sup>2</sup>M<sup>3</sup> was in 2011 at 15.23%, while the lowest was in 2015 at 0.16%. For Malaysia, the highest Total CO<sup>2</sup>M<sup>3</sup> was in 1996 at 14.10%, while the lowest was in 2015 at 0.38%.

**E. Total Trembesi Tree**

**Table 6.11**  
**Total Trembesi Tree Indonesia & Malaysia**  
**1990 – 2019**

Year	Indonesia	% Growth	Malaysia	% Growth
1990	51,926	13.00	19,716	12.65
1991	56,786	9.36	22,221	12.71
1992	59,968	5.60	24,165	8.75
1993	65,081	8.52	24,979	3.37
1994	69,098	6.17	27,018	8.16
1995	78,189	13.16	29,432	8.94
1996	82,274	5.22	33,582	14.10
1997	90,411	9.89	35,965	7.09
1998	91,628	1.35	36,154	0.53
1999	97,891	6.84	39,235	8.52
2000	98,305	0.42	42,684	8.79
2001	105,905	7.73	44,481	4.21
2002	107,389	1.40	47,835	7.54
2003	117,674	9.58	50,460	5.49
2004	120,407	2.32	55,253	9.50
2005	120,842	0.36	58,389	5.68
2006	127,754	5.72	60,589	3.77
2007	133,326	4.36	66,084	9.07
2008	132,344	- 0.74	70,572	6.79
2009	138,418	4.59	63,516	- 10.00
2010	146,295	5.69	69,863	9.99
2011	168,582	15.23	70,761	1.29
2012	170,789	1.31	71,326	0.80
2013	159,411	- 6.66	77,130	8.14
2014	171,947	7.86	81,291	5.40
2015	172,225	0.16	81,596	0.38
2016	173,677	0.84	80,225	- 1.68
2017	186,989	7.66	78,207	- 2.51
2018	204,600	9.42	84,077	7.51
2019	226,946	10.92	91,477	8.80

Viewed from Table 6.11, the Total Trembesi Tree Indonesia & Malaysia from 1990 to 2019, Total Trembesi Tree is needed to overcome air pollution. Every 1 trembesi tree can overcome air pollution per year 28.5 tons. For Indonesia, the highest total demand for trembesi tree was in 2011 at 15.23%, while the lowest was in 2015 at 0.16%. For Malaysia, the highest total demand for trembesi tree was in 1996 at 14.10%, while the lowest was in 2015 at 0.38%.



## F. Total Degradation

**Table 6.12**  
**Total Degradation Indonesia & Malaysia**  
**1990 – 2019**

Tahun	Indonesia	% Growth	Malaysia	% Growth
1990	726,398	12.91	431,386	4.88
1991	794,380	9.36	486,202	12.71
1992	838,899	5.60	528,734	8.75
1993	910,415	8.52	546,546	3.37
1994	966,616	6.17	591,151	8.16
1995	1,093,794	13.16	643,970	8.94
1996	1,280,706	17.09	636,725	- 1.13
1997	1,407,367	9.89	681,896	7.09
1998	1,426,320	1.35	685,488	0.53
1999	1,523,815	6.84	743,899	8.52
2000	1,530,260	0.42	809,294	8.79
2001	2,237,494	46.22	1,076,304	32.99
2002	2,268,851	1.40	1,157,470	7.54
2003	2,486,129	9.58	1,220,977	5.49
2004	2,543,877	2.32	1,336,953	9.50
2005	2,553,069	0.36	1,412,855	5.68
2006	2,986,913	16.99	1,463,809	3.61
2007	3,117,185	4.36	1,596,559	9.07
2008	3,094,215	- 0.74	1,704,980	6.79
2009	3,236,219	4.59	1,534,507	- 10.00
2010	3,420,389	5.69	1,687,856	9.99
2011	4,558,516	33.27	1,913,408	13.36
2012	4,618,194	1.31	1,928,683	0.80
2013	4,310,504	- 6.66	2,085,612	8.14
2014	4,649,504	7.86	2,198,137	5.40
2015	4,656,999	0.16	2,206,391	0.38
2016	4,949,800	6.29	2,286,400	3.63
2017	5,329,200	7.66	2,228,900	- 2.51
2018	5,831,100	9.42	2,396,200	7.51
2019	6,467,951	10.92	2,607,103	8.80

Viewed from Table 6.12, it states that the Total Degradation of Indonesia & Malaysia from 1990 to 2019, this Total Degradation is obtained from the amount of Trembesi tree needs multiplied by the current Trembesi tree price of \$28.5. For the previous year's price, the inflation rate is used. For Indonesia, the highest Total Degradation was in 2001 at 46.22%, while the lowest was in 2013 at 6.66%. For Malaysia, the highest Total Degradation was in 2001 at 32.99%, while the lowest was in 2009 at 10%.

## G. Green GDP

**Table 6.13**  
**Green GDP Indonesia & Malaysia**  
**1990 – 2019**

Year	Indonesia	% Growth	Malaysia	% Growth
1990	261,455,072,628	6.61	70,943,717,041	7.84
1991	283,465,276,594	8.42	79,528,713,037	12.10
1992	301,520,411,473	6.37	86,719,483,814	9.04
1993	321,931,624,671	6.77	95,674,927,080	10.33
1994	346,703,292,249	7.69	104,835,057,805	9.57
1995	374,215,600,454	7.94	115,025,310,539	9.72
1996	402,163,950,570	7.47	125,947,030,561	9.50
1997	422,020,908,313	4.94	135,368,406,122	7.48
1998	366,862,994,430	- 13.07	126,375,591,215	- 6.64
1999	370,560,472,224	1.01	133,596,030,695	5.71
2000	385,786,350,199	4.11	143,542,728,930	7.45
2001	400,765,041,306	3.88	145,455,603,598	1.33
2002	420,321,327,895	4.88	153,062,660,906	5.23
2003	440,059,528,394	4.70	161,004,555,178	5.19
2004	457,735,531,984	4.02	169,452,204,370	5.25
2005	478,882,518,052	4.62	176,076,727,726	3.91
2006	505,309,303,123	5.52	185,429,362,179	5.31
2007	534,867,318,002	5.85	197,786,807,806	6.66
2008	561,306,850,468	4.94	204,652,904,881	3.47
2009	598,626,114,966	6.65	205,908,082,365	0.61
2010	632,160,868,054	5.60	221,248,903,485	7.45
2011	661,756,944,468	4.68	230,607,786,292	4.23
2012	707,539,875,053	6.92	242,200,554,456	5.03
2013	750,616,398,376	6.09	254,872,621,736	5.23
2014	795,204,079,289	5.94	271,349,403,892	6.46
2015	846,220,514,196	6.42	288,565,556,494	6.34
2016	891,872,309,723	5.39	306,064,611,543	6.06
2017	934,262,326,103	4.75	322,564,207,841	5.39
2018	973,255,263,891	4.17	332,356,492,089	3.04
2019	1,029,532,073,155	5.78	350,316,114,846	5.40

Judging from Table 6.13 it states that the Green GDP of Indonesia & Malaysia from 1990 to 2019, Green GDP is obtained from the Semi Green GDP minus the amount of degradation. For Indonesia, the highest Green GDP was in 1991 at 8.42%, while the lowest was in 1998 at 13.07%. For Malaysia, the highest Total Degradation was in 1993 at 10.33%, while the lowest was in 1998 at 6.64%.

### **6.3.2 Stationarity Test**

#### **A. Stationarity Test**

The Augmented Dickey Fuller unit root tests for green openness, labour force, capital, green GDP and disparity for both Indonesia and Malaysia is recored in the Table 6.14. The results of Augmented Dickey Fuller unit root tests for Indonesia shows that all variables are integrated at the first difference, I(1). Besides, the results of Augmented Dickey Fuller unit root test in Malaysia also shows that all variables are integrated at the first difference, I(1). Since none of the variables are integrated at the higher order (I(2)), therefore it is feasible to conduct the regression analysis using Ordinary Least Square (OLS) method for both countries time series, provided that the model passed all classical assumptions and diagnostic tests.

Table 6.14: Results of Augmented Dickey Fuller unit root test for Indonesia

Table 6.14: Results of Augmented Dickey Fuller unit root test for Indonesia										
	GREEN		OPENNES		CAPITAL		LABOUR		GINI	
	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference
Z(t)	-4.827	-8.062	-2.876	-7.629	-1.665	-3.198	-2.344	-5.039	-1.906	-4.577
Prob. of Z(t)	0.0004***	0.0000***	0.1705	0.0000***	0.7659	0.0848*	0.4098	0.0002***	0.6517	0.0011***
Critical values for rejection of hypothesis of a unit root										
1% critical value	-4.343	-4.352	-4.334	-4.343	-4.334	-4.343	-4.334	-4.343	-4.343	-4.352
5% critical value	-3.584	-3.588	-3.580	-3.584	-3.580	-3.584	-3.580	-3.584	-3.584	-3.588
10% critical value	-3.230	-3.233	-3.228	-3.230	-3.228	-3.230	-3.228	-3.230	-3.230	-3.233
Results of Augmented Dickey Fuller unit root test for Malaysia										
	GREEN		OPENNES		CAPITAL		LABOUR		GINI	
	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference
Z(t)	-5.223	-8.315	-1.879	-4.644	-1.686	-4.324	-1.221	-4.654	-2.511	-5.750
Prob. of Z(t)	0.0001***	0.000***	0.6652	0.0009***	0.7570	0.0029***	0.9061	0.0008***	0.3225	0.000***
Critical values for rejection of hypothesis of a unit root										
1% critical value	-4.343	-4.352	-4.334	-4.343	-4.334	-4.343	-4.334	-4.434	-4.343	-4.352
5% critical value	-3.584	-3.588	-3.580	-3.584	-3.580	-3.584	-3.580	-3.584	-3.584	-3.588
10% critical value	-3.230	-3.233	-3.228	-3.230	-3.228	-3.230	-3.228	-3.230	-3.230	-3.233

### 6.3.3 Findings of Model 1

#### a) Indonesia

The study used Ordinary Least Square in analysing the model introduced in Chapter 4. The model specified that the green GDP is affected by openness, capital and labour. All variables were previously transformed into natural logarithm forms. We also consider the time effect in the model to capture the structural break of several crisis affected in the region such as Asian financial crisis 1997/1998 and global financial crisis 2008. Indonesia faced two crises; political and economic crisis in late 1997, so, the econmoc sluggish was experienced in later year 1998-1999 (Nasution, 2000). After a decade, global financial crisis crisis very much affected the world GDP in 2008, but for Indonesia economy can withstand the turbulances and still recorded at positive growth (Basri & Rahardja, 2010). Hence, the financial crisis year 1998-1999 is included in the model.

So the estimation model 1 indicated in column A is

$$\text{Green GDP} = f(\text{Openness, capital, labour, D-1998, D-1999})$$

On the other hand, we regress non-linear effect between openness and green gdp according to past literature as indicated in column B.

$$\text{Green GDP} = f(\text{Openness, openness2, capital, labour, D-1998, D-1999})$$

Table 6.15: OLS results for Indonesia

Variables	Indonesia					
	A			B		
	Coefficient	t-Statistics	Prob. of t-Statistics	Coefficient	t-Statistics	Prob. of t-Statistics
<b>Openness</b>	0.12823	1.20	0.243	5.6726	1.98	0.060*
<b>Openness2</b>				-0.71631	-1.94	0.065*
<b>Capital</b>	0.32636	2.73	0.012***	0.1826	1.35	0.191
<b>Labour</b>	-0.89031	-1.00	0.328	0.0181	0.02	0.985
<b>D-1998</b>	-3.10357	-37.11	0.000***	-2.7961	-15.75	0.000***
<b>D-1999</b>	-0.19431	-3.04	0.006**	-0.2157	-3.50	0.002***
<b>Constant</b>	5.107239	1.37	0.183	-8.924	-1.11	0.280
<b>F-stat</b>	570.76***			530.66***		
<b>R<sup>2</sup></b>	0.9917			0.9928		
<b>Adjusted R<sup>2</sup></b>	0.9899			0.9910		

\*\*\*, \*\* significant at 1% and 5% significance level, respectively.

The regression analysis as displayed in the above table shows that capital has positive and significant influence on the Green GDP. The coefficient of capital is 0.326 implies that one percent increases in capital will eventually increases the green GDP in Indonesia by 0.36%.

The capital has positive impact on the green GDP consistent with past studies as Marlina (2015) indicates that the capital accumulation improved the basic infrastructure of the Indonesia development and contribute to economic growth. Besides that, when there are any economic turbulences in the economy, the green GDP is affected adversely, with more negative impact especially when the Asian Financial Crisis hit Malaysia in 1997 to 1998. Overall, model 1 in column A can explained 98 percent of green gdp nexus in Indonesia.

In column B, the OLS results shows that trade openness has non-linear effect on green GDP as demonstrate by past studies (Talberth & Bohara, 2006; Wang, 2011). The findings indicate that the trade openness at first has positive and significant effect on green GDP growth and later negatively influenced the growth as non-inverted U-curve. The time effect in period year 1998-1999 are consistently has significant impact by negatively contributed to growth of green GDP.

#### b) Malaysia

As mentioned in Chapter 4, the following table shows the findings for model 1 for both countries. To recap, the first model is focusing on the determinants of green GDP which is influenced by openness, capital and labour.

$$\text{Green GDP} = f(\text{Openness, capital, labour})$$

However, it is important to add in as well the year dummy to cater for any structural break issue. For instance, Malaysia was facing with economic turbulence in 1997 to 1998 (Asian financial crisis), as well as in 2008 to 2009 (global financial crisis). Therefore, to ensure unbiased estimation, we add in D-1998 (as year dummy for 1998) and D-2009 (as year dummy for 2009) in Malaysia's estimation.

Table 6.16: OLS results for Malaysia

Variables	Malaysia		
	Coefficient	t-Statistics	Prob. of t-Statistics
<b>Openness</b>	-0.18950	-1.09	0.285
<b>Capital</b>	0.62400	5.98	0.000***
<b>Labour</b>	-1.56439	-1.06	0.297
<b>D-1998</b>	-3.5696	-28.15	0.000***
<b>D-2009</b>	-0.3441	-2.52	0.019**
<b>F-stat</b>	181.88		
<b>R<sup>2</sup></b>	0.9743		
<b>Adjusted R<sup>2</sup></b>	0.9689		

\*\*\*, \*\* significant at 1% and 5% significance level, respectively.

From the Malaysia's perspective, capital is the only variable that is significant in explaining the green GDP. The effect is positive. Since all variables were previously transformed into natural logarithm forms, it implies that one percent increase in capital will eventually increase the green GDP in Malaysia by 0.62%. Besides that, when there are any economic turbulences in the economy, the green GDP is affected adversely, with more negative impact especially when the Asian Financial Crisis hit Malaysia in 1997 to 1998.

The above findings are valid since they met all classical assumption tests for Ordinary Least Square (OLS) method. The results for the classical assumption tests are explained in the next section.

### 6.3.4 Classical Assumptions and Diagnostic Tests for Model 1

#### 1. Indonesia

The viability and reliability of model can be signified using several diagnostic test. First, the Variance Inflation Factors (VIF) test is conducted and depicted in the below table. The VIF mean value shows less than 10 so there is no multicollinearity problem.

<b>Variance inflation factor</b>		
	VIF	1/VIF
ltrade	4.099	.244
lgcf	3.184	.314
llf	1.214	.823
y9	2.13	.47
y10	1.244	.804
Mean	2.374	.
VIF		

Next, Apart from multicollinearity test, it is also important to ensure that the model is free from any heteroscedasticity, serial correlation and misspecification problems. Thus, the followings are the results of the tests:

<b>Diagnostic Test</b>	<b>Type of Test</b>	<b>Results</b>	<b>Probability</b>	<b>Conclusion</b>
Heteroskedasticity	Breusch-Pagan test	$\text{Chi}^2 = 0.71$	0.3985	No heteroscedasticity problem
Serial correlation	Breusch-Godfrey LM test	$\text{Chi}^2 = 2.933$	0.0868	No serial correlation problem
Misspecification issue	RAMSEY Reset Test	$F = 0.00$	0.9761	No misspecification problem

The null hypotheses for the above diagnostic tests are as follows:

- Variances are constant
- No serial correlation
- Model has no omitted variables

Since the probabilities for all the tests are more than 0.05, we can conclude that the above model is free from any of the three problems. Thus, the results of the OLS are valid.



## 2. Malaysia

One of the methods to check for the multicollinearity problem is by looking at the Variance Inflation Factors (VIF). The following table shows that none of the VIF values are more than 10. Thus, it indicates that the first model is free from any multicollinearity problem.

<b>Variable</b>	<b>VIF</b>	<b>1/VIF</b>
<b>Openness</b>	1.93	0.51763
<b>Capital</b>	1.28	0.78052
<b>Labour</b>	2.17	0.46084
<b>D-1998</b>	1.06	0.94204
<b>D-2009</b>	1.24	0.80931

Apart from multicollinearity test, it is also important to ensure that the model is free from any heteroscedasticity, serial correlation and misspecification problems. Thus, the followings are the results of the tests:

<b>Diagnostic Test</b>	<b>Type of Test</b>	<b>Results</b>	<b>Probability</b>	<b>Conclusion</b>
Heteroskedasticity	Breusch-Pagan test	$\text{Chi}^2 = 0.30$	0.5853	No heteroscedasticity problem
Serial correlation	Breusch-Godfrey LM test	$\text{Chi}^2 = 1.123$	0.2893	No serial correlation problem
Misspecification issue	RAMSEY Reset Test	$F = 1.16$	0.3326	No misspecification problem

The null hypotheses for the above diagnostic tests are as follows:

- Variances are constant
- No serial correlation
- Model has no omitted variables

Since the probabilities for all the tests are more than 0.05, we can conclude that the above model is free from any of the three problems. Thus, the results of the OLS are valid.

### 6.3.5 Findings of Model 2

By using OLS for model 1, we have found out the relationship between openness, capital and labour towards green GDP in both Malaysia and Indonesia. We are also interested to investigate how green GDP affect the income disparity in both countries. Therefore, the second model is developed and tested using two-stage least square (2SLS). The results of the 2SLS for both countries are as follows.

#### 1. Indonesia

The following table shows the results of the 2SLS for Malaysia.

Variables	Malaysia					
	A			B		
	Coefficient	t-Statistics	Prob. of t-Statistics	Coefficient	t-Statistics	Prob. of t-Statistics
<b>Green GDP</b>	0.11388	2.24	0.033**	1.065	2.30	0.029**
<b>D-1998</b>				3.1425	2.22	0.035**
<b>Constant</b>	3.2096	21.77	0.000***	0.3719	0.27	0.789
<b>F-stat</b>	5.01			2.97		
<b>Prob. of F-stat</b>	0.0334**			0.068*		

\*\* and \* indicate significance level at 5% and 10%, respectively.

The result shows green GDP contribute significantly on income inequality. To ensure the robustnesst in our findings, we regress with and without time effect to cater for any significant structural breaks that happen along the period of study. The findings implies one percent increase in green GDP leads to a greater income inequality in Indonesia approximately by 0.11% accordingly in column A and B. The results is in accordance with study done by Pangkiro (2016) indicated the positive economic growth induce more inequality among the society. The result is robust for both estimation model. Furthermore, the Asian Financial Crisis 1998 has led to a greater income inequality by 0.31% in 1998.

## 2. Malaysia

The following table shows the results of the 2SLS for Malaysia.

Variables	Malaysia		
	Coefficient	t-Statistics	Prob. of t-Statistics
<b>Green GDP</b>	0.14832	1.93	0.064*
<b>D-1998</b>	0.61125	2.15	0.041**
<b>F-stat</b>	2.53		
<b>Prob. of F-stat</b>	0.0982*		

\*\* and \* indicate significance level at 5% and 10%, respectively.

The result shows that one percent increase in green GDP leads to a greater income inequality in Malaysia by 0.14%. Besides, the Asian Financial Crisis has led to a greater income inequality by 0.61% in 1998.

### 6.3.6 t-test Different test

**Table 6.49**  
**t-test Different Test Green GDP**

Group Statistics					
COUNTRY	N	Mean	Std. Deviation	Std. Error Mean	
GREEN_GDP	INDONESIA	30	5.4857E+11	2.23332E+11	4.07746E+10
	MALAYSIA	30	1.8788E+11	7.95277E+10	1.45197E+10

Independent Samples Test										
		Levene's Test for Equality of Variances				t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
GREEN_GDP	Equal variances assumed	27.937	.000	8.333	58	.000	3.60682E+11	4.32827E+10	2.74042E+11	4.47321E+11
	Equal variances not assumed			8.333	36.238	.000	3.60682E+11	4.32827E+10	2.72920E+11	4.48443E+11

From the results of the t-test Different test, the results of Sig 0.000 are obtained, it can be concluded that there is a significant difference between the Green GDP of Indonesia and Malaysia.

## 6.4 Result

### A.Indonesia

Variables	Indonesia					
	A			B		
	Coefficient	t-Statistics	Prob. of t-Statistics	Coefficient	t-Statistics	Prob. of t-Statistics
<b>Openness</b>	0.12823	1.20	0.243	5.6726	1.98	0.060*
<b>Openness2</b>				-0.71631	-1.94	0.065*
<b>Capital</b>	0.32636	2.73	0.012***	0.1826	1.35	0.191
<b>Labour</b>	-0.89031	-1.00	0.328	0.0181	0.02	0.985
<b>D-1998</b>	-3.10357	-37.11	0.000***	-2.7961	-15.75	0.000***
<b>D-1999</b>	-0.19431	-3.04	0.006**	-0.2157	-3.50	0.002***
<b>Constant</b>	5.107239	1.37	0.183	-8.924	-1.11	0.280
<b>F-stat</b>	570.76***			530.66***		
<b>R<sup>2</sup></b>	0.9917			0.9928		
<b>Adjusted R<sup>2</sup></b>	0.9899			0.9910		

#### 1.The Effect of Green Openness on Green GDP

X1 Openness on Green GDP. The green openness variable has insignificant effect on Green GDP with probability value 0.243 and a t statistic of 1.20 as indicated in column A. However, Column B shows that the green openness variable is significantly has non-linear effect on Green GDP with probability value of 0.06 and 0.065 with t-statistic of 1.98 and -1.94. It can be concluded that the green openness has positive effect on Green GDP, with the regression formula  $Y = -8.924 + 5.6726X_1Openness + -.71631X_2Openness^2$ . The interpretation is one percent increase in green openness there will be 5.6 percent increase in Green GDP. But, the higher trade openness up to certain threshold will decrease the green GDP by 0.71 percent. The results of this study are in accordance with previous research conducted by Purnomo (2018). Trade openness as has a significant effect on economic growth in ASEAN in 2013-2017. Also, the results shows that trade openness has non-linear effect on green GDP as demonstrate by past studies (Talberth & Bohara, 2006; Wang, 2011). The findings indicate that the trade openness at first has positive and significant effect on green GDP growth and later negatively influenced the growth as non-inverted U-curve.

#### 2.The Effect of Labor Force on Green GDP

X2 Labor Force on Green GDP. Labor Force has no significant effect on green GDP since the probability value is more than 10 percent confidence level. The findings contradict to the results of

previous studies conducted by Adha and Andiny (2022) showed that labor in the agricultural sector has a negative and insignificant effect on economic growth in the agricultural sector in Indonesia.

### 3. Effect of Capital on Green GDP

X3 Capital on Green GDP. The Capital variable has a significant positive effect on Green GDP with probability value is 0.012 and statistical t value of 2.73. This implies an increase one percent of capital will increase the green GDP by 0.32p ercent. It can be concluded that the regression formula of Column A is  $Y=5.107+ 0.32636X3$  Capital. The results confirmed the capital formation has a positive effect on GDP (economic growth) in Indonesia 1975-2014 (Safari & Fikri, 2016). Expanding more capital allocated for remote areas to build infrastructure, especially transportation routes to facilitate economic development anticipated to improve the productivity of green economy such as building wind power plants, building tourism forests, planting trees.

### 4. Effect of Green GDP on Disparity (GINI Index)

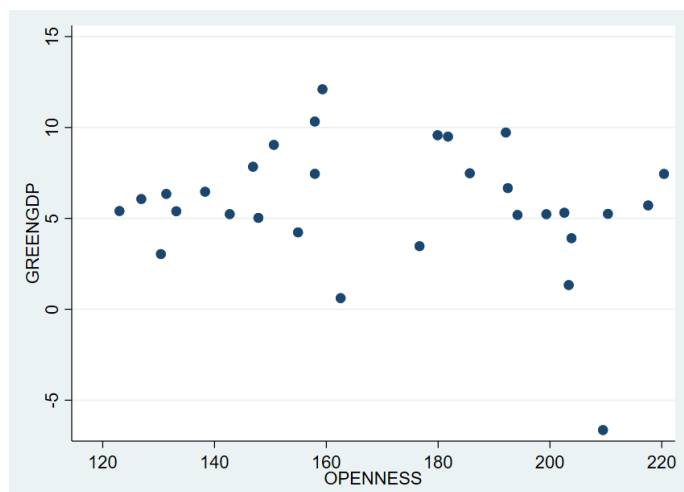
Variables	Malaysia					
	A			B		
	Coefficient	t-Statistics	Prob. of t-Statistics	Coefficient	t-Statistics	Prob. of t-Statistics
<b>Green GDP</b>	0.11388	2.24	0.033**	1.065	2.30	0.029**
<b>D-1998</b>				3.1425	2.22	0.035**
<b>Constant</b>	3.2096	21.77	0.000***	0.3719	0.27	0.789
<b>F-stat</b>	5.01			2.97		
<b>Prob. of F-stat</b>	0.0334**			0.068*		

The OLS regression analysis on Green GDP-GINI nexus is found to be interesting. The Green GDP has positive and significant effect on Dispairty (GINI Index) at 5 percent confidence level. The result is robust either inclusive with or non structural breaks of indicating the impact of financial crisis 1998. An increase of Green GDP increase the effect of inequality in the country. The results is confirmation with previous research conducted by Pangkiro (2016) shows that the economic growth has a positive effect on economic disparity excluding the North Sulawesi Province in period of 2003 to 2013. Although the results of this study that Green GDP has a good effect on Disparity (GINI Index), it can still be improved by making programs in the smallest areas (villages) so that development will be felt equally between villages and cities, the impact of differences in disparity will be small.

## B. Malaysia

### 1.The Effect of Green Openness on Green GDP

Since the p-value of the t-statistics for the green openness is 0.285, this variable is insignificant in influencing the green GDP in Malaysia. The results of this study might be due to a very little contribution of green openness in Malaysia that does not significantly affect the green GDP in the country. For instance, by looking at the figure below, at one time, Malaysia has large value of green openness, but with a negative value of green GDP. Similarly, there were also few times in which Malaysia's green openness were large (in between 140 to 160), but the green GDP is still relatively small.



Even though this green openness is not significant in influencing green GDP, its role should not be neglected. There is still a need to promote export and import related to green products and services to ensure better environmental prospects in the future.

### 2.The Effect of Labor Force on Green GDP

Similar to green openness, the p-value of the t-statistics indicates that the labour force is also insignificant in explaining the green GDP in Malaysia. It might be due to the composition of the labour force in Malaysia that is focusing much on manufacturing and services sector. Labours that work in green economy is still limited, thus leading to insignificant relationship towards green GDP.

### 3.Effect of Capital on Green GDP

Out of the three variables, capital is the only independent variable that is significant in explaining the green GDP in Malaysia. The coefficient of 0.624 implies that one percent increase in capital will increase green GDP by 0.624 percent in Malaysia. This result is consistent with previous research that found a positive relationship between the two variables (Safari and Fikri, 2016).

Higher injection of capital can further boost the green GDP in Malaysia, especially when the capital is channeled towards green initiatives agenda, parallel with the Sustainable Development Goals (SDGs).

#### **4. Effect of Green GDP on Disparity (GINI Index)**

The probability of the t-statistics of 0.064 implies that the green GDP is significant in influencing income disparity at 10 percent significance level. Besides, the positive coefficient of 0.14832 signifies that one percent increase in green GDP will increase the income disparity by 0.1483 percent. As Malaysia is practicing green economy, more research and developments are expected to be in place especially to promote green initiatives. Those initiatives might lead to an increase in green GDP through capital injection, but there might be cases whereby certain unskilled labours are left out in the process. It might leads to a greater disparity in income.

## CHAPTER VII

### CONCLUSION AND SUGESTION

#### 7.1 Conclusion

1. For the Green Economy Valuation calculated from Conventional GDP minus the Depletion Natural Source value, we get Semi Green GDP, while the Green GDP value is obtained from Semi Green GDP minus the Degradation value. The degradation value is obtained from the total costs incurred to overcome air pollution by planting trembesi trees.
2. For Indonesia there is a positive simultaneous influence between Green Openness, Labor Force and Capital on Green GDP, while partially there is a positive influence of Green Openness and Capital on Green GDP, but for labor force there is a negative influence on Green GDP. For the simultaneous effect of Green Openness, Labor Force and Capital on Green GDP of 86.5%, the rest is influenced by other variables.
3. For Indonesia, the most dominant variable affecting Green GDP is Green Openness of 7.44 times, then Capital of 0.13 times, while the labor force variable has a decrease of 3.15 times.
4. For Malaysia, capital is the sole and dominant variable that influence green GDP. If Malaysia wants to achieve 5 percent of real GDP in a year, there is a need to inject 3 percent of additional capital in the economy, particularly on green initiatives and planning. However, as the green GDP increases, the government needs to conduct various initiatives to reduce the inequality effect that might increase as the green GDP increases. Based on previous example, if green GDP increases by 5 percent, it is expected that the income inequality will further increase by 0.7416 percent. Even though this value is relatively small, it is still an issue that needs to be tackled by the government to ensure everyone in the country receives the benefits from the improvement in the green GDP.
5. For Green GDP itself there is a positive influence on Disparity (GINI Index), while Green GDP has an effect on Disparity (GINI Index) of 72.9%, the rest is influenced by other variables.
6. For the t-test difference on the Green GDP variable, it states that there is a significant difference in Green GDP between Indonesia and Malaysia.

#### 7.2 Suggestion

1. The green economy valuation can be increased again by calculating the degradation from the reduction of land for growing rice as a basic need



2. Although the results of this research, Green Openness, Labor Force and Capital simultaneously have a good effect on Green GDP, it can still be improved by creating a green economy development program (Green Campaign) such as increasing urban farming activities and reducing carbon, air and water pollution.
3. There should be further research on the variables to be studied more, so that the dominant variables will be the best
4. Although the results of this study that Green GDP has a good effect on Disparity (GINI Index), it can still be improved by making programs in the smallest areas (villages) so that development will be felt equally between villages and cities, the impact of differences in disparity will be small.
5. The results of the Green GDP research on Indonesia and Malaysia are good, but need to be improved for further research in ASEAN countries

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## **DRAFT ARTICLE JOURNAL**

### **GREEN ECONOMY AND GREEN OPENNESS OVERVIEW INDONESIA & MALAYSIA GREEN BUSINESS**

#### **ABSTRACT**

To overcome the weakness of conventional economic growth, a green growth strategy is needed. The green growth strategy focuses on the positive mutual reinforcement of economic and environmental policy aspects. To realize the principles of sustainable development, especially in the application of a green economy in Indonesia and Malaysia, a policy was made to support this program. The government of the Unitary State of the Republic of Indonesia made real efforts as stated in the RPJPN 2005-2025 as one of the long-term development missions. Meanwhile in Malaysia, the green economy concept has been initiated by the government in terms of technological evolution, through the establishment of the Ministry of Energy, Green Technology and Water (KeTTHa) in 2009. Under the Eleventh Malaysia Plan (RMK, 2015), the government has introduced the Malaysian Quality of Life Index (MQLI) in 1999 to provide an aggregate measure of sustainable living (EPU, 1999).

This study analyzes the influence of openness, capital, and labour credit on the Green GDP and their impact on Green GDP its implications for income disparity/gap. Knowing the comparison of the green GDP in Indonesia and in Malaysia.

The study used secondary data annual 1990-2019 obtained through related agencies. The data analysis method uses OLS Multiple Linear Regression which begins with the Stationarity Test and Cointegration Test. Determination of the dominant factor and the amount of contribution using the beta value ( $\beta$ ). The dependent variable difference test (t test difference) is to determine the comparison of the green GDP in Indonesia and Malaysia.

The result of research For the Green Economy Valuation calculated from Conventional GDP minus the Depletion Natural Source value, we get Semi Green GDP, while the Green GDP value is obtained from Semi Green GDP minus the Degradation value. The degradation value is obtained from the total costs incurred to overcome air pollution by planting trembesi trees. For Indonesia and Malaysia there is a positive partial influence between Green Openness on Green GDP. For the t-test difference on the Green GDP and Green Openness variable, it states that there is a significant difference in Green GDP and Green Openness Variables between Indonesia and Malaysia. The Suggestion of The green economy valuation can be increased again by calculating the degradation from the reduction of land for growing rice as a basic need. Although the results of this research, Green Openness have a good effect on Green GDP, it can still be improved by creating a green economy development program (Green Campaign) such as increasing urban farming activities and reducing carbon, air and water pollution.

**Keyword : Green Economy, Green Openness, Valuation**

## **I.INTRODUCTION**

The concept of sustainable development is currently getting attention from various parties. The population density factor is an important factor that demands the availability of sufficient natural resources, this is the main problem that must be found an effective and efficient solution. Sustainable development is the integration between the economy and the environment as a human effort to improve the quality of life. Economic development based on natural resources that does not pay attention to aspects of environmental sustainability will ultimately have a negative impact on the environment itself. Basically, natural resources and the environment have a limited carrying capacity. In other words, economic development that does not pay attention to the capacity of natural resources and the environment will cause development problems in the future (Burhanudin, 2016, p.11).

In the conventional economic system, economic growth is the most important economic indicator. Economic growth is calculated based on the increase in the value of the Gross Regional Domestic Product (GDP). GDP which is currently known as conventional GDP or Brown GRDP. Brown / conventional GRDP is considered not to describe the situation of sustainable economic development because its value still contains depreciation in the value of natural resources and is indicated to contain the value of degradation of environmental benefits. The growth that occurs in the economic system is faced with unfavorable environmental system conditions. The amount of material and energy provided by the environmental system does not increase. Therefore, in certain situations the optimal point of economic growth will be reached. If the optimal point has been reached, the value of losses due to waste and degradation of materials and environmental services will be greater than the benefits derived from economic growth (Rahmat, 2016. p,209-217).

To overcome the weakness of conventional economic growth, a green growth strategy is needed. The green growth strategy focuses on the positive mutual reinforcement of economic and environmental policy aspects. Green growth takes into account the total value of natural capital as a factor of production and its important role in growth. Green growth also focuses on finding cost-effective ways to reduce pressure on the environment so that the transition to a new growth pattern that can be created does not exceed the carrying capacity of the environment. In green growth innovation plays an important role, because depletion of natural resources at a certain point will have a negative impact on growth. Innovation can play a role in creating substitutions for depleted natural resources to support growth. The green growth strategy recognizes that the measurement of economic progress should take into account the contribution of natural resource assets to the well-being, health and prosperity of mankind. Measurement of economic progress also concerns the

quality and composition of growth as well as the impact of growth on human welfare (DAN, D. B. S. D. A., 2013, pp. 14-18).

To realize the principles of sustainable development, especially in the application of a green economy in Indonesia and Malaysia, a policy was made to support this program. The government of the Unitary State of the Republic of Indonesia made real efforts as stated in the RPJPN 2005-2025 as one of the long-term development missions. The National Long-Term Development Plan (RPJPN) 2005-2025 lays out the vision of Indonesia's development which is independent, advanced, just and prosperous. The conditions described in this vision are marked by the level of independence, progress, justice, and prosperity to be achieved. Development as an effort to fill independence must be an effort to build independence. In one of the 8 (eight) development missions to achieve the conditions described in the vision, especially those related to sustainable development, the 6th vision is: Indonesia Asri and Lestari. To achieve this, the missions to be pursued are: (i) improving the management of development implementation that can maintain a balance between utilization and sustainability; (ii) the existence and utilization of natural resources and the environment while maintaining the function, carrying capacity and comfort in life today and in the future through the use of space that is in harmony between utilization for settlements, socio-economic activities and conservation. efforts, improve the economic utilization of resources. sustainable natural resources and environment; (iii) improve the management of natural resources and the environment to support the quality of life, provide the beauty and comfort of life, and increase the maintenance and utilization of biodiversity as the basic capital of development.

Meanwhile in Malaysia, the green economy concept has been initiated by the government in terms of technological evolution, through the establishment of the Ministry of Energy, Green Technology and Water (KeTTHa) in 2009. Under the Eleventh Malaysia Plan (RMK, 2015), the government has introduced the Malaysian Quality of Life Index (MQLI) in 1999 to provide an aggregate measure of sustainable living (EPU, 1999). This emphasizes the importance of balanced development, which is able to support sustainable economic growth, thereby providing a high quality of life for the community (EPU, 2011 & 2013). The Malaysian government's proactive actions in MQLI (2011) and the green economy concept appear to complement each other in meeting the needs of the whole community.

As reported by the OECD Investment Policy Review in 2013, the Malaysian government has placed a positive emphasis on implementing sustainable development, and has understood the need to conserve the environment rather than focusing solely on the country's economic development. Major changes in environmental policy and public acceptance of the impact of the environment on their quality of life are important. Hence, a comprehensive set of policies and laws

have been drafted which includes the National Climate Change Policy, Green Technology policy and Renewable Energy policy for Malaysia (KeTTha, 2015). All these proactive actions have been made to demonstrate the proper movement of the government to support green growth for the benefit of the people. According to Hezri and Ghazali (2011) Malaysia's national green economy framework reflects mainstream economic framing, such as the United Nations Economic Program (UNEP) and the Organization for Economic Cooperation and Development (OECD). The main objective is to strengthen the Malaysian economy through incentives, tax system, pricing, regulatory framework, and prioritizing all investments (Lestari, 1999 in Abdul Hamid, 2019).

Conventional GDP valuation Methods can interpret the progress of economic development, especially the impact of environmental pollution, so the importance of evaluating Green GDP is to calculate environmental aspects that are not carried out on Conventional GDP, so that by calculating Green GDP it is clear the impact of losses from economic development that does not pay attention to environmental factors. As a reference for the calculation of Green GDP by Wibowo, E. W et.al (2021) for the province of Jakarta as the capital of the State of Indonesia. In 2019 the province of DKI Jakarta obtained a GDP of Rp. 1,842,996,120 (million), - while the 2019 green GDP valuation result is Rp. 1,824,804,136 (million), from these results the impact of the green economy is not implemented, the Jakarta provincial government actually gets a loss of Rp. 18,191,984,- (million). Similar results were stated by Stjepanović, S et.al (2017) showing that the GDP growth rate and the Green GDP growth rate in 2014, differed significantly in almost all countries, both between countries in the same group and between countries in different categories of countries. We see that the difference between average GDP growth and Green GDP growth is approximately 1% to 3%, environmental quality in 2014 was sacrificed to achieve higher growth rates and the benefits of higher standard economic features, so the losses are even greater.

Green economic growth is very necessary for sustainable development, many impacts are felt when development does not care about natural & environmental elements. This research will analyze the valuation of Green GDP and the openness. Conventionally, GDP states that trade openness affects economic growth (Purnomo, RN2018), On the application of green economy to international trade in the case of the openness effect, the sign is positive for openness, but a negative sign for the square of green openness (Wang, 2011). In the end, the idea of a green economy is expected to be able to harmonize the short and long term, and to offset the short term costs by maximizing the synergies and long term economic benefits (for example, job creation and poverty alleviation, increased efficiency) and mitigation (Hallegatte, 2012). In this research will compare Conventional GDP and Green GDP against 2 countries, Indonesia and Malaysia, as well as provide policy implications for the government and entrepreneurs regarding the best potential for the green business / economy in the future.

## **II. STUDY LITERATURE**

### **2.1.Green GDP**

The green economy concept initiated by UNEP seems to be tasked with eradicating the myth that has been developing, namely the trade off between the economy and the environment. Cato (2009) in Siswanto et al. (2013) in Suhada and Setyawan (2016, p.21-35) states that a green economy is needed because the economic system adopted so far is full of injustice and inequality (an indicator of inequality). Although currently the green economy has become the mainstream of economic thought, so far the development of the green economy in many countries is still at the normative level or does not yet have a significant proportion in the national economic system.

The economic development model that incorporates environmental variables is known as the green economy. The calculation of environmentally friendly Gross Domestic Product (GDP), known as Green GRDP, is a serious effort to control environmental impacts.

### **2.2.Openness**

Suliswanto (2016, pp.33-48) An economic model that includes export and import activities is called an open economy. In this model, we will look at two new streams in the circulation of income streams, namely the flow of income received from exports, which is an injection into the income stream, and the flow of spending on buying imported goods, which is a leak into the income stream. These two flows will affect the balance of the country's economy. Exports will increase national income in a balanced way and create economic growth. On the other hand, imports reduce national income in the balance of the country's economy (Sukirno, 2006).

### **2.3.Effect of Economic Openness on GRDP/economic growth and Green GDP/Economic**

Several previous studies analyzed the effect of economic openness on conventional economic growth, including:

- Maharani, K., & Isnowati, S. (2014) Research results Variable economic openness is statistically significant, has a negative effect on economic growth in Central Java in 1985 – 2010
- Anggraini, S.D. (2019). The Trade Openness variable has no effect on Indonesia's economic growth in 2013-2017
- Purnomo, R. N. (2018) Trade openness as the first independent variable has a significant effect on economic growth in ASEAN in 2013-2017



From the results of previous studies, it can be concluded that there is an effect on economic openness and no effect on conventional economic growth. From the results of previous studies, this will be the basis of this research by replacing the conventional economic growth variable (brown) with the green economic growth variable, so that from these results it will be known whether economic openness has an effect on green economic growth. In terms of green gdp in the case of the openness effect, a positive sign for openness, but a negative sign for the square of green openness, this represents two opposite directional effects showing a non-linear correlation between green openness and green GDP, the first green GDP rising with an increase in openness trade to a turning point, then diminishes with green openness (Wang, 2011)

### **III.METHOD**

The method of determining research areas and respondents was carried out purposively, namely green GDP in Indonesia and Malaysia. The study was conducted from January to December 2022.

#### **3.1 Population, Sample and Research Sampling**

The population in this study is all variable data studied in Indonesia. Determination of the sample in this study using purposive sampling technique, namely in accordance with the required amount. The number of samples was determined by annual data between 1990 and 2019 or a total of 30 samples, both in Indonesia and in Malaysia.

#### **3.2 Data and Data Collection Methods**

The data collected in this research is time series secondary data. Secondary data were obtained through related agencies in this study such as BPS or worldbank.

#### **3.3 Variables and Variable Operational Definitions**

In this study, the independent variables are Openness (X1 and Green GDP (Y) is treated as an intermediate variable. To understand the interpretation, several definitions and operational limits are determined as follows:

- 1.Green GDP of Indonesia and Malaysia in 1990-2019.
2. Green Economy Openness is the comparison of the value of exports - imports with Green GRDP in Indonesia and Malaysia in 1990-2019.

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### 3.4. Data Analysis Method

#### 3.4.1. Formulation model:

The first model is used to determine the effect of openness, capital, labour, on the green GDP. Model 1a for Indonesia and Model 1b for Malaysian data  $Y = b_0 + b_1x_1 + e$

Remarks:

Y = Green GDP  
x<sub>1</sub> = Openness

#### 3.4.2. Data Analysis Method

##### 3.4.2.1 Valuation Green GDP

Data analysis methods that will be applied consist of:

##### (1) Valuation Semi Green GDP

According to Suparmoko (2006) in (Mulya, 2016), Semi-Green GRDP is a GRDP that includes elements of natural resource and environmental depletion. Mathematically, can be expressed as follows:

Semi-Green GRDP is obtained by subtracting the depletion value of natural resources from the value of Conventional GRDP (or Brown GRDP). Depletion value is obtained by multiplying the volume of extraction of each type of natural resource by unit rent or unit price.

$$D = Q \times U$$

Where:

D = depletion value

Q = volume of natural resources taken

U = unit rent

How to calculate unit rent is by subtracting the cost of taking per unit from the price of natural resources including the value of profit per unit (remuneration for investment expenses) that is acceptable to investors. The proper profit value is the same as the interest rate on loans in banks as an alternative cost of capital invested to exploit natural resources in the area concerned. Here's how to calculate unit rent.

## **(2) Valuation Green GDP**

To get the value of Green GRDP, the value of environmental damage or degradation is reduced by the value of Semi Green GRDP, so that the value of Green GRDP is obtained. Calculating environmental damage is more complex because it is necessary to use various estimates according to the type of natural resource and degraded environment. The calculation steps in assessing environmental damage are as follows (Ratnaningsih, 2012) in (Mulya, 2016):

- (a) Identification of the degraded environment
- (b) Physical quantification of environmental degradation
- (c) Economic assessment of environmental damage.

**3.4.2.2.** The data analysis method in this study uses OLS multiple linear regression to determine the effect of the dependent variable on the independent variable in each model for both Indonesian and Malaysian green GDP data with the analysis stages:

### **a. Stationarity Test and Cointegration Test**

To test whether the time series data is stationary and does not contain spurious regression, the unit root testing stage is carried out using the Augmented Dicky Fuller (ADF) method (Gujarati, 2012). The real cointegration test produces a regression that has a long-term balance, which is done by using the Johansen Cointegration Test.

### **3.4.2.3. Hypothesis testing**

#### **t test**

The t test is used to determine the effect of each of the openness, capital, labour on the green GDP

$$t_{hit} = \beta_i / (Se(\beta_i)); \text{ where } Se(\beta_i) = \sqrt{[Se]^{-2} / (\sum 1^{-2} (1-r))}$$

Information:

$\beta_i$  = regression coefficient  $\mu_1, \mu_2, \mu_3, \mu_4$  and  $\mu_5$ ;  $Se(\beta_i)$  = standard error  $\mu_1, \mu_2, \mu_3, \mu_4$  and  $\mu_5$

#### **3.4.2.4. t-test Different test**

Different test independent sample t-test is to test two groups that have the same variant. This test is used to test the differences in the green GDP of Indonesian and the green GDP of Malaysian (Pramana, 2012; idtesis.com, 2019, Resmi et.all., 2020).

## IV RESULT & DISCUSSION

### 4.1 Result

#### A.Valuation of Green Economy Indonesia & Malaysia

**Table 1 : Valuation of Green Economy Framework**

<b>GDP CONVENTIONAL</b>	<b>XXX</b>
<b>DEPLETION</b>	
Depletion of Natural Source	<u>(XXX)</u>
<b>Semi Green GDP</b>	<b>XXX</b>
<b>Degradation</b>	
Pollution Cost (Trembesi Tree)	<u>(XXX)</u>
<b>Green GDP</b>	<b>XXX</b>

For the Green Economy Valuation calculated from Conventional GDP minus the Depletion Natural Source value, we get Semi Green GDP, while the Green GDP value is obtained from Semi Green GDP minus the Degradation value. The degradation value is obtained from the total costs incurred to overcome air pollution by planting trembesi trees.

#### B Stationary Test

**Table 2 : Stationary Test**

<b>STATIONARY TEST</b>	<b>INDONESIA</b>	<b>MALAYSIA</b>
GREEN OPENNESS	0.0000	0.0000
GREEN GDP	0.0002	0.0002

The results of the stationarity test on the Green GDP and Green Openness variable, the probability value less than 0.05, it is concluded that the data for the Green GDP and Green Openness variable is stationary.

### C. t-Different Test

**Table 3 : t-Different Test**

t-different test	INDONESIA & MALAYSIA
Green GDP	<b>0.000</b>
Green Openness	<b>0.018</b>

From the results of the t-test Different test of Green GDP and Green Openness, the results less than 0.05, it can be concluded that there is a significant difference between the Green GDP and Green Openness variables of Indonesia and Malaysia.

### D. Hypotesis Test

**Table 4 : t - Test**

t-test	INDONESIA	MALAYSIA
Probability	0.002	0.023
t-Statistic	3.4	2.405
Coefficient	0.000195	0.000199
C	0.10438	0.10924

Green Openness to Green GDP of Indonesia and Malaysia, probability value less than 0.05, with a t statistic of positive, it can be concluded that the green openness variable has a positive effect on Green GDP

### E. Findings

#### 4.2 Discussion

Green Openness on Green GDP, probability value less than 0.05, with a t statistic of positive, it can be concluded that the green openness variable has a positive effect on Green GDP, with the regression formula :

- Indonesia  $Y=0.10438 + 0.000195 X_1$  Green Openness
- Malaysia  $Y=0.10924 + 0.000199 X_1$  Green Openness

This can be interpreted when green openness increases 1 time, Indonesia Country, there will also be an increase in Green GDP as much as 0.104 times. Malaysia Country, there will also be an increase in Green GDP as much as 0.109 times.

The results of this study are in accordance with previous research conducted by Purnomo, R. N. (2018) Trade openness as the first independent variable has a significant effect on economic growth in ASEAN in 2013-2017. Although the results of this study, Green Openness has a good effect on Green GDP, but it can still be improved by increasing net trade, especially increasing the export value of green products so that in the future, green openness will increase.

## **V. CONCLUSION & SUGGESTION**

### **5.1 Conclusion**

1. For the Green Economy Valuation calculated from Conventional GDP minus the Depletion Natural Source value, we get Semi Green GDP, while the Green GDP value is obtained from Semi Green GDP minus the Degradation value. The degradation value is obtained from the total costs incurred to overcome air pollution by planting trembesi trees.
2. For Indonesia and Malaysia there is a positive partial influence between Green Openness on Green GDP. For the t-test difference on the Green GDP and Green Openness variable, it states that there is a significant difference in Green GDP and Green Openness Variables between Indonesia and Malaysia.

### **5.2 Suggestion**

1. The green economy valuation can be increased again by calculating the degradation from the reduction of land for growing rice as a basic need
2. Although the results of this research, Green Openness have a good effect on Green GDP, it can still be improved by creating a green economy development program (Green Campaign) such as increasing urban farming activities and reducing carbon, air and water pollution.

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