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The Impact of Carbon Emissions on the Green Economy and Sustainable Development in BRIIJC Countries

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Abstract*. Increasing carbon emissions have the unintended consequence of worsening environmental quality as a result of the use of fossil fuels for green economic activities. The green economy concept is being applied in relation to social and economic difficulties, as well as sectors in one of the global strategic areas aimed at overcoming very rapid climate change. The green economy's quality is determined by CO2 emission levels and creates sustainable development, which can improve environmental quality in some countries (Brazil, Russia, India, Indonesia, Japan, and China), particularly during epidemics. In data analysis, various test procedures are utilized. According to the study findings, there was a considerable increase in CO2 emissions in the BRIIJC country during Covid 19, which had an impact on environmental quality, culminating in ozone layer depletion and climate change. The implementation of a green economy can affect environmental circumstances by requiring economic operations to use more ecologically friendly energy, and boosting energy can boost economic growth.*

Keywords*: CO2 Emissions, Green Economy, Sustainable Development.*

INTRODUCTION

Human-caused global warming has resulted in a slew of environmental difficulties that pose a severe threat to human growth and existence (Abdelhady, 2016). In response to appeals from the UN and other international organizations, a number of countries have proactively committed to "carbon neutrality" in order to limit the impact of greenhouse gas emissions and global warming (Salvia et al., 2021). China has vowed to "further strengthen its capacity for innovation, implement more proactive and effective policies and measures, and strive to lower 2030 carbon rise and quality emission environment in 2060" (Wang et al., 2021).

To achieve "double carbon" in China, it is necessary to reduce carbon emissions from the building industry and stimulate its transformation (Sun et al., 2022). The construction industry considerably contributes to carbon emissions. China has recently recognized the significance and enormous possibilities of reducing carbon emissions. It is vital to expedite the transformation and upgrading of the construction industry, as well

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as to actualize green production and construction, in order to reduce carbon emissions (Fan, Li, & Pei, 2018).

Concerns about the environment are critical to long-term growth. Developing countries, in particular, want faster economic development rates. The BRIIJC nations are making unusually quick economic progress and advancement. Economic growth, however, has been accompanied by a variety of major socioeconomic and environmental issues (Zhao et al., 2021). Russia, India, and China are three of the top four pollutants in the world, but the other BRICS economies pollute as well (Yang et al., 2021).

Green innovation and financial development have recently gained importance in promoting environmental sustainability. Green bonds, according to Arenhardt et al. (2016) and Chen et al. (2012), are a vital component in achieving environmental sustainability. According to Roy and Khastagir (2016) and Albert-Morant et al. (2017), green innovation contributes to improved environmental performance and lower pollution levels. Green innovation refers to manufacturing, management, and distribution strategies that increase the proportion of environmentally friendly materials, consumption, and waste recycling while decreasing the amount of energy derived from fossil fuels. These components assist society's environment as well as the overall success of the organization (Albort-Morant et al., 2016; Ganda, 2020). However, development finance obtains funds in a variety of ways and paves the way with the support of modern production and distribution techniques, technology, and economic development. As a result, these two criteria are crucial for long-term environmental sustainability and work effectively together (Albino et al., 2015). As a result, Tamazian, Rao (2010), and Al-mulali (2015) believe that financial development can help to solve environmental problems.

Nonetheless, although the majority of extant research focus on high-quality economic development, just a tiny number of scholars focus on high-quality green economic growth. The importance of green credit as a "lubricant" and "driver" of socioeconomic development cannot be overstated. If many countries want to achieve high-quality green economic development, they must pay special attention to how green financing resources are allocated. To attain the goal of high-quality growth, the theoretical basis for the relationship between green credit and greater green economic development must be explained. Prior scholarly studies began with the concept of "sustainable development" and progressed to the concept of "sustainable growth quality." Unlike the

conventional and established concept of "sustainable growth," the concept of "sustainable growth quality" more accurately captures the unfavorable outcomes of sustainable growth rates and emphasizes the complementary objective of economic advancement. Many academics have built sustainable growth quality indicator systems based on research on the quality connotation of sustainable growth (Ren, 2012; Yan and Li, 2012). Kuznet promotes sustainable growth as long as conditions increase economic and societal well-being (Jingan, 2012;57). Researchers investigate high-quality development and high-quality economic growth. Innovation, production resource availability, organizational structures, environmental constraints, and levels of governance are all essential drivers of high-quality economic development (Fang and Ma, 2019; Li and Ren, 2019). The consequences of diverse scholarly definitions of high-quality economic development are similar, suggesting that high-quality economic development is a reasonably broad notion.

They also contend that, while research on economic quality through the development of index systems has grown in popularity, the use of a single indicator to assess high-quality economic development remains rather limited. Some researchers have developed novel systems based on bonding, coordination, greenness, and openness (Wei and Li, 2018, Zhang and Liu, 2019, Li et al., 2019).

Salahuddin et al. (2015) evaluated the link between carbon emissions, long-term growth, power consumption, and financial development in Gulf Cooperation Council (GCC) countries. They discovered that economic progress can lower carbon emissions dramatically. By investigating the effects of actual output, renewable and nonrenewable energy, trade, and financial development on carbon emissions in significant green energy countries, Dogan and Seker (2016) discovered that financial development reduces carbon emissions. Increasing carbon dioxide emissions, according to Tamazian et al. (2008), necessitate openness and financial liberalization. According to Tamazian and Rao (2010), financial liberalization may have a negative impact on the environment if it is not implemented within a solid institutional framework.

Jalil and Feridun (2011) discovered that financial development can lower carbon dioxide emissions and indicate the presence of an environmental Kuznets curve in China by examining Chinese panel data. Boutabba (2014) discovered that carbon dioxide emissions are driven by financial development based on his studies in India. Hu et al. (2013) discovered that when banks provide green loans on a bigger scale, enterprises

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work harder to reduce emissions and the level of carbon emission management becomes more obvious. China pledged at the United Nations General Assembly's 75th session on September 22, 2020, that "China assumed experience increased carbon dioxide emissions in 2030 and stability 2060."

The achievement of the "carbon peak" and "carbon neutral" targets is closely related to the creation of a superior green economy. Current research focuses on how green funding affects long-term growth rather than high-quality green economic development. They are also less interested in the institutions that govern the interaction between carbon emissions, green finance, and high-quality green economic development. The establishment of a high-quality green index system and the assessment of economic development are the foundations of this research, which also depends on green credit, high-quality carbon emissions, and the reality of green economic development.

Climate change is having a growing impact on countries worldwide. Land use and forestry changes are the principal drivers of CO2 emissions worldwide. According to Carbon Brief, the greatest polluters in 2022 will be countries with enormous geographic areas that have been intensively deforested for fuel and agricultural land. For example, in the United States, waves of settlers spread from east to west. Locals also cleared agricultural land when they migrated. With 102,562 GtCO2, Indonesia ranks sixth in the world in terms of cumulative carbon emissions, suggesting that the country contributes to global environmental change. With the rising use of motorized vehicles and the widespread use of coal, the United States will produce more than 509 Gigatonnes of CO2 (GtCO2) by the end of 2022, making it the country's greatest cumulative carbon emitter. By far the most (20.3% of the total) and is associated with a 0.2C global warming.

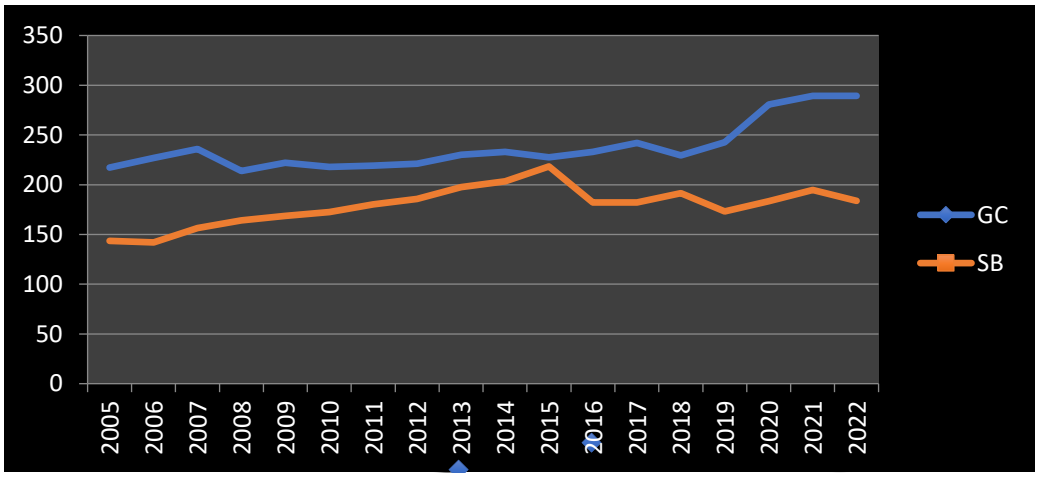

Figure 1. Data on Carbon Emissions for BRIIJC Countries in 2023

Growing carbon emissions in a country are the root cause of sustainability economics, which identifies countries that are best positioned to manage sustainable growth in order to advance equitable and sustainable economic development. However, the global economic catastrophe grows more visible as time passes, peaking in early 2022. With Covid-19 wreaking havoc on the entire planet, global economic movements have stagnated, and efforts to change the global economy to be more productive and ecologically friendly have been placed on hold for the time being. This, however, does not diminish our urge to think about ways to make the world a more inviting, safe, and secure place. Given that we have just consumed a large amount of energy in the last two years to meet our basic needs, we should be OK for the next 100 years. Beginning with the Kyoto Protocol and the Paris Agreement, the world has realized and agreed on the need of creating a solid basis for our planet's future. Furthermore, plans for Indonesia to become more Indonesian-friendly over the next 100 years have been devised. In contrast to traditional economics, which attempts to eliminate field work, green economics seeks to increase it..

LITERATURE REVIEW

Russia is the Middle East's greatest energy consumer, with an anticipated 362 terawatt hours consumed in 2019, roughly the same as in 2018. Implementation of energy efficiency and demand-side management measures, slower GDP growth, slower population growth, and rising electricity prices all contributed to a significant slowdown in electricity generation growth between 2016 and 2018, which had grown at an annual rate of 6% between 2000 and 2015 (APICORP, 2019). The COVID19 pandemic-induced economic slowdown resulted in a 1% decrease in energy generation in 2020, according to the BP Statistical Review of World Energy (2021).

Lockdowns and COVID-19-related restrictions increased household electricity consumption while decreasing commercial and government electricity sales (SEC, 2020). Natural gas (61%) and crude oil (39%) were responsible for nearly all of Russia's electrical generation in 2020. In contrast, the Saudi government is attempting to diversify the fuels used in electricity production in order to optimize crude oil supply for export while reducing its carbon footprint. BP, 2021). The share of overall power generation accounted for by natural gas has increased dramatically over the last decade, from 42%

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in 2010 to 52% in 2021, owing to increased gas-fired generation capacity supported by higher output (BP Statistical Review of World Energy, 2021).

Because of a major slowdown in natural gas output growth, especially during the hot summer months, the power industry consumed more crude oil in 2019 and 2020. The Saudi government plans to transition from crude oil and diesel power plants to heavy fuel oil and natural gas in the next years (Reuters, 2021). Several studies have found a correlation between carbon emissions and the use of renewable energy. For example, Apergis et al. (2010) evaluated the relationship between carbon emissions and the use of environmentally friendly energy in 19 developed and developing nations. The authors used the VECM and ARDL techniques to study this relationship. Carbon emissions and the adoption of renewable energy are both causally related.

Sebri and Ben-Salha (2014) studied the relationship between carbon emissions and the use of environmentally friendly energy in BRICS countries. They used a VECM model with annual data from 1971 to 2010 to investigate this causal connection. According to the research, there is a two-way causal relationship between renewable energy use and carbon emissions. The findings of Attiaoui et al. (2017) back up Sebri and Ben-Salha (2014), who discovered a bidirectional causal relationship between carbon emissions and the use of environmentally favorable energy. Aydoan and Vardar (2020) have investigated the relationship between carbon emissions and green energy use in the E7 countries.

These correlations were investigated by the authors utilizing Granger causality techniques and the ARDL panel limits test. The data suggest a bidirectional causal relationship between carbon emissions and energy efficiency. In the case of Thailand, however, a study conducted by Boontome et al. (2017) found no evidence of a direct relationship between carbon emissions and green energy use. Numerous studies show that using green energy reduces carbon emissions. For example, Zoundi (2017) examined the link between carbon emissions and green energy uptake in 25 African nations using data from 1980 to 2012 and cointegration ARDL panel methodologies. According to the research, using green energy improves the environment. According to Qi et al. (2014), adopting environmentally friendly energy reduced environmental damage in China between 2010 and 2020. Moreover, numerous studies have indicated that using

environmentally friendly energy improves environmental quality (Salahuddin et al., 2015; Rauf et al., 2018; Saidi and Omri, 2020; Jebli et al., 2020; Ullah et al., 2020).

During this time period, governments all over the world made controlled development a policy priority. This is supported by a range of new measures, from global awareness to national systems, environmental rules in various levels of government, local initiatives, and surrounding planning. Regardless of these efforts, realistic observations accumulated over time show that global environmental sustainability remains a long way off, and that things are really becoming worse.

Dissatisfaction with policy implementation, according to this argument, is a significant factor in the current predicament. An review of these articles on a regular basis reveals that political, economic, and interpersonal factors are inhibiting the environmental strategy from generating the anticipated effects. Conflicts between financial development and environmental regulatory goals, a lack of incentives to embrace environmental policies, and a failure to adequately communicate targets to key stakeholders are the primary reasons why environmental sustainability cannot be achieved. Marc et al. (2017) and Haseeb et al. (2019).

RESEARCH METHOD(S)

SPSS was used to evaluate the following hypotheses: a. The T test is used for independent samples. This test investigates the significance of mean differences between two groups, as well as the effect of the independent variable on the dependent variable. A data analysis method that applies the t test is necessary to establish how effective the Green Economy implementation is in achieving equitable and sustainable economic development, the formula for which is:

Paired T-Sample Test

Researchers assessed the impact of implementing the Green Economy at BRIIJC using a paired sample T-test. The following is the manual t-test formula: in addition to

$$t = \frac{\bar{X_1} - \bar{X_2}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2} - 2r\left(\frac{s_1}{\sqrt{n_1}}\right)\left(\frac{s_2}{\sqrt{n_2}}\right)}} \qquad (3.1)$$

X_1 indicates the mean of sample 1, and X_(2 represents the mean of sample 2). The standard deviation number one is s_1, and the standard deviation number two is s_2. The first variation sample is s_12, and the second variation sample is s_22. The correlation between the second and third samples is denoted by r.

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FINDINGS AND DUSCUSSION

The provisions that apply in this new test model are modified to reflect the following hypothesis: Ho: EMS (CO2 emissions) in the BRIIJC, which includes Brazil, India, Indonesia, Russia, Japan, and China, did not alter significantly before and during the COVID-19 pandemic. Ha: Before and during the COVID-19 outbreak, EMS (CO2 emissions) in the BRIIJC (Brazil, India, Indonesia, Russia, Japan, and China) varied significantly. The following are the results of data processing with SPSS 25:

Table of Mean EMS Variables in BRIIJC Countries

Table 1. Mean EMS Variables in BRIIJC Countries (Paired Samples Statistics)

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	EMS 5H BEFORE COVID 19	3,1301	100	1,34422	,13442
	EMS 5H After COVID 19	3,4460	100	,73765	,07376

Table 2. Mean EMS Variables in BRIIJC Countries (Paired Samples Correlations)

		N	Correlation	Sig.
Pair 1	5H before COVID 19 and 5H after Covid 19	100	,205	,041

Table 3. Mean EMS Variables in BRIIJC Countries (Paired Samples Test)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	5H before COVID 19 - 5H after Covid 19	-,31590	1,39471	,13947	-,59264	-,03916	-2,265	99	,026

According to the results of the aforesaid tests, the average CO2 emissions in the six BRIIJC countries prior to the COVID-19 pandemic were 2.9251, and thereafter climbed to 3.1308. The BRIIJC EMS variable has a sig (2-tailed) value of 0.0002, or 0.05, showing a significant difference in EMS in BRIIJC countries before and after Covid-19. This essay contends that dissatisfaction with policy implementation is a significant element in the current situation. A routine examination of these publications demonstrates that political, economic, and interpersonal variables are impeding the environmental strategy from

producing the desired results. The fundamental reasons why environmental sustainability cannot be fulfilled are conflicts between financial development and environmental regulatory goals, a lack of incentives to embrace environmental policies, and a failure to appropriately communicate targets to key stakeholders. According to Marc and colleagues (2017) and Haseeb and colleagues (2019), transportation, industry, and telecommunication all have an effect on increasing carbon emissions, thereby increasing greenhouse effect gases, causing ozone layer erosion, which has an impact on climate change, as has occurred frequently in recent years. Manufacturing, telecommunications, and transportation all contribute to increased carbon emissions, which raise greenhouse gas levels and harm the ozone layer. As a result, climate change has become more prominent in recent years.

CONCLUSION AND RECOMMENDATION

The Covid 19 outbreak became a strategy that will be remembered; the implementation of restrictions on outdoor activities halted all economic activities for two years, affecting all levels of society; and the unstoppable economic crisis slowed the country's development as a result of the economic recession that occurred. happen. People must think critically in order to survive during this dark period, in which they must safeguard their bodies' health from the possibility of lethal illnesses as well as find ways to earn money due to a reduction in employment opportunities due to economic activity constraints. The primary initiative being developed to turn the economy around is technological sophistication. All parts of life are increasingly being conducted online, beginning with education, industry, communication, and home activities. However, because technological growth thins the atmosphere over time, resulting in climate changes that might impair environmental quality, the use of internet technology has a negative impact on the ozone layer.

Brazil and China's EMS expanded during the pandemic, and the findings show that their EMS before and after the COVID-19 pandemic differed. EMS in Indonesia and India declined, and the findings show that their EMS differed before and during the COVID-19 pandemic. EMS Russia, Indonesia, and Japan all experienced decreases. Furthermore, EMS levels in BRIIJC countries increased overall during the pandemic, and there are substantial differences in EMS conditions before and during the Covid-19 epidemic.

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