



The Role of Shariah Economics in Realizing Sustainable Development Based on Green Economy

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The Green Economy is an issue that has recently become a popular topic of discussion. This research aims to understand the role of Shariah economics in reducing carbon dioxide emissions and helping to achieve the Sustainable Development Goals (SDGs), particularly in the economic development pillar. The research variables are renewable energy sources, using samples of hydroelectricity and biofuel. The study examines how much these two variables influence the contribution of carbon dioxide emissions produced annually in Indonesia. A quantitative approach with descriptive explanation is the most suitable method for this research, supported by secondary data sources. Based on the t-statistic test, both hydroelectricity and biofuel variables do not have an impact on carbon dioxide emissions resulting from various activities. However, the F-test shows that both hydroelectricity and biofuel contribute to carbon dioxide emissions, although their contribution is only 1%.

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Green Economy is an issue that has started to be widely discussed and continuously voiced in the recent period. This study aims to determine the role of Islamic economics in reducing carbon dioxide emissions and helping to realize the goals of the SDGs, especially in the pillar of economic development. The variables of this study are renewable energy using hydroelectricity and biofuel samples. From these two variables, it is seen how much influence they have on the contribution of carbon dioxide emissions produced annually in Indonesia. Quantitative with descriptive explanation is the most suitable approach used in this study supported by secondary data sources. Based on the t-statistic test, the two hydroelectricity and biofuel variables have no effect on carbon dioxide emissions produced due to various activities. However, from the F test carried out, it can be seen that the hydroelectricity and biofuel variables both have a contribution to carbon dioxide emissions even though their contribution is only 1%.

Keywords: Green economy; renewable energy; emissions.

1. INTRODUCTION

Scarcity is a global issue that occurs due to the impact of damage to the environmental ecosystem and natural resources which causes the phenomenon of shortages in the supply of production goods in various sectors in line with economic growth in the current era [1]. Issues that are related to sustainable development programs such as high carbon levels caused by environmental pollution and even the emergence of emissions, in addition to being caused by the continuous extraction of natural resources and the phenomenon of inequality and the absence of social justice. Green Economy is an issue that continues to be raised in recent times. It is no wonder that many people define it as an economy that prioritizes environmentally friendly principles [2]. Green economy is an economic activity that can be expected to increase the prosperity and welfare of the people as the ultimate goal of economic activity, not to forget also specifically to achieve justice, justice for society or the environmental ecosystem and natural resources themselves [3].

When viewed from the perspective of Islamic economics, the problems that occur have similarities with Maqashid al-Syariah. Viewed from the terminology, Maqashid al-Syariah is Allah's desire to spread welfare to mankind, by fulfilling the needs of daruriyah, hajyah, to tahsiniyah so that mankind has a guaranteed life and becomes a complete servant of Allah [4]. Therefore, in order to achieve life in accordance with the purpose of Allah SWT in creating humans, one must strive by carrying out the provisions of Allah SWT. (Lestari, 2022).

Humans who always prioritize profits from anything have led to the emergence of green economic thinking which aims to erode little by little the human nature of always prioritizing

personal interests over other interests that must also be considered [5]. From the definition that has been described, the green economy is in line with the concept of Islamic economics, where Islamic law instructs economic management without causing damage to the earth. However, in fact, in various activities and production activities, it is still very rare to pay attention to environmental sustainability but instead only think about obtaining profits as much as possible. If this greed continues in the long term, it will also have a negative impact on the survival of humans themselves.

The main principle of the green economy is to be able to meet current needs without having to sacrifice the fulfillment of the needs of each generation in the future. Thus, the understanding of the green economy and sustainable economy is not different from each other, but the existence of both functions as the main motor in sustainable development. The concept of the green economy is not a substitute for sustainable development, but rather an affirmation that sustainable development can only be achieved by ensuring that humans live in an appropriate economic model with an environmental perspective and are friendly to the environment itself.

The negative impacts caused by climate change have made many countries in various parts of the world, including Indonesia, try to find and explore solutions to start step by step to protect and maintain the earth regularly [6]. The UN is directly involved in finding efforts and solutions to deal with this phenomenon. Indonesia is the host of the G20, Indonesia has expressed policies in financing sustainable development, green economy and low-carbon movements [7]. Although the global economy is predicted to slow down, the foundation of the Indonesian economy is considered to have better resilience than other

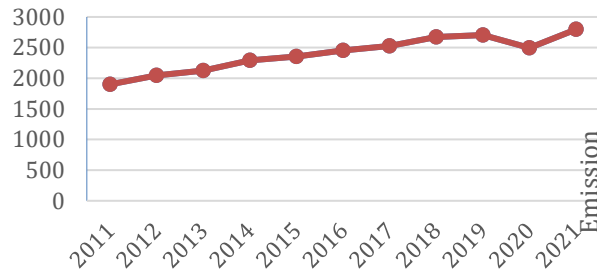


Chart 1 .Carbon Dioxide Emission Levels in Indonesia

Source: BP Statistical Review of World Energy [8]

countries. Based on the economy that has experienced growth at 5% in seven consecutive quarters. In the second quarter of 2023, it was 5.17% with an inflation rate that is still relatively safe at 3.17% in August 2023. "A strong foundation is the basis for Indonesia to provide support for the green economy which is a new source of sustainable economic growth in the future," said Coordinating Minister for Economic Affairs Airlangga Hartarto as reported by the Katadata Sustainability Action for The Future Economy (SAFE) 2023 event on Tuesday, September 26 (*Ministry of Finance, 2023*).

The constitution was made to manage the environment, Law No. 32 of 2009 concerning Environmental Protection and Management by taking into account the improvement of Law Number 23 of 1997 concerning Environmental Management with the hope of guaranteeing legal certainty and protection of individual rights to have a good, safe, and healthy environment as a concern for the sustainability of the entire ecosystem. Presidential Regulation (Perpres) Number 98 of 2021 which talks about carbon reduction in order to contribute to greenhouse gas emissions to support national development efforts which is a government commitment to environmental maintenance aimed at a green economy.

Based on data released by the BP Statistical Review of World Energy in 2022, we can see that carbon dioxide emissions produced by various activities have continued to increase rapidly in the last 11 years. Although in 2019 to 2020 emissions decreased due to Covid-19 which hampered many activities so that emission levels continued to decline. However, emission levels have continued to increase in 2021 until now due to the new normal life after Covid-19. This has caused carbon dioxide emissions to increase again, and a solution is needed for this phenomenon.

2. LITERATURE REVIEW

2.1 SDGs (Sustainable Development Goals)

The global and national commitments contained in the SDGs which aim to provide welfare to the community are linked to 17 goals that are targeted globally until 2030, which are implied in developed and developing countries at the UN General Assembly held in September 2015 [9] . The SDGs plan has 17 Goals and is poured into four pillars of sustainable development, namely the Pillar of Economic Development, the Pillar of Social Development, the Pillar of Environmental Governance Law, and the Pillar of Environmental Development [10].

The Pillar of Economic Development has the hope of improving the quality of the economy through opening up job opportunities and business opportunities, providing new creative and innovative colors, inclusive industry, supportive infrastructure, environmentally friendly clean energy [11]. The Pillar of Economic Development has five goals including clean and easily available energy, decent work accompanied by economic growth, opening up many industries with creative innovation supported by adequate infrastructure, and having partners to walk together to achieve goals.

2.2 Emissions

According to the main trigger of climate change is global warming originating from fossil fuel-intensive activities that have the potential to increase carbon dioxide emissions [12]. Developed countries that have gone through the industrialization period contribute more than two-thirds (67 percent) of the total global carbon emissions historically (Friedrich et al., 2020). So, indirectly economic activities that use fossil fuels

also contribute to carbon dioxide emissions. It has an incompatibility with sharia principles that pay attention to the environment and living things in it. So that sharia economics provides a solution by using and taking advantage of Allah SWT's creations. such as wind energy, sunlight and water which can be converted into more environmentally friendly power plants [13].

2.3 Renewable Energy

Islam commands humans to manage nature as best as possible to meet all needs man. But Islam also provides strict prohibitions against humans do not destroy nature by all forms and methods. Therefore it is important awareness that business activities must be based on norms and ethics that originate from the teachings of revelation from the Al-Quran and Hadits.

One of the most important factors in human life is an energy source that can be utilized and used to facilitate the survival of mankind [14]. Time after time that passes makes the human population grow and develop higher every year so that indirectly makes the need and requirement for energy even higher. For example, the need for energy from fossil fuels or coal is also increasing and this kind of energy is included in energy that is not easily renewed. Thus, it makes many thoughts to replace this energy with energy that is easier to obtain and easy to produce in a not too long period of time. For example, the opinion arises to utilize energy sources such as wind, water or fuels made from organic fuels to be utilized and this is what is called a renewable energy source [15]. The emergence of renewable energy which is considered more environmentally friendly makes support for changing to a low-carbon era easier to achieve.

1. Water is a renewable energy

The abundant water resources make water one of the largest renewable energies. The utilization of this energy can be aimed at converting water into electrical energy so that water can also be used as a hydroelectric power plant. [16]. Water can be converted into electrical energy if the water energy is processed by a hydroelectric power plant and its energy is converted into mechanical energy by a turbine and then converted again by a generator into electrical energy by utilizing the speed and height of the water until the electricity can be distributed and distributed.

2. Biofuel (Organic fuel)

Biofuel is a category of new and renewable fuels by utilizing and processing organic materials such as algae, plants, and waste from organic materials. They can be utilized to produce alternative fuels and substitutes for fossil fuels such as diesel. For example, ethanol is made using the fermentation method of sugar cane or corn [17].

2.4 Green Economy

Environmental ethics is philosophical basis for the current global dissemination of the green economy. Implementation of green economy based on environmental ethics is a form of pragmatism countries in the world regarding environmental issues. The implementation of a green economy should be a model an implementable, innovative, reliable and green economy comprehensive. Not just low policies carbon emissions or an ethics-based green economy model environment. The urgency of designing a green economy model which is comprehensive and in harmony with the characteristics of each nation based on the facts of the world Currently experiencing degradation of natural ecosystems.

The basic concept of green economy can be divided into two parts. First, it is not only centered on macroeconomics but green economy is here to see and think about the problems that arise due to the complexity of economic activities. Green economy offers solutions by looking at environmental sustainability with more environmentally friendly solutions both from industry, investment and the consequences of various economic activities. Second, it provides steps to start green investment and offers policies that can eradicate poverty and increase employment opportunities for all groups with support from the government and other levels of power [18].

The theory of planned behavior is the origin of the emergence of the concept of a green economy where this theory says that a person will have a reason to protect and maintain the place where their survival occurs. In other words, humans indirectly have an emotional view to help protect their foothold to stand [19].

In the green economy there are maqashid sharia values that make it in line with the sharia economy. Thus the green economy and the

sharia economy have some similarities. Maqashid al-syariah is inclined towards the welfare, paying attention to and maintaining al-dharuriyyat. There are basic goals in it which are stated in: (1) Hifdz al-din which requires us to maintain religion, (2) Hifdz al-nafs focuses on maintaining our souls so that we can distinguish between haram and halal which have been determined by Allah SWT, (3) Hifdz al-aql prioritizes always using common sense, (4) Hidz al-Nasl guarantees the survival of our descendants so that their prosperity can continue to be guaranteed, (5) Hifzhu al-Maal requires us to be careful in managing the assets that have been entrusted to us, sharia economics does not only think about the world but also the consequences that will be borne in the hereafter [20].

2.5 Empirical Study

The study on "Renewable Energy and Sharia Economy: Synergy to Realize Sustainable Development" by Iskandar & Aqbar [4] is intended to see and examine the concept of combining sharia economy and renewable energy programs in Indonesia in seeing its role in sustainable development. Showing results if the contribution of sharia economy has a role in increasing an independent economy through energy self-sufficiency.

The study on "The Relationship between Islamic Microfinance Institutions and the Sustainable Development Goals (SDGs) Agenda" was also conducted by Nuringsih [21] with the aim of determining the role of Islamic financial institutions in achieving a sustainable economy. Showing that BPRS and BMT provide access to financial services to lower-middle class communities, and also hope to improve the

standard of living of the community as a whole. By providing capital to small and medium businesses to be able to participate in improving welfare.

3. METHOD

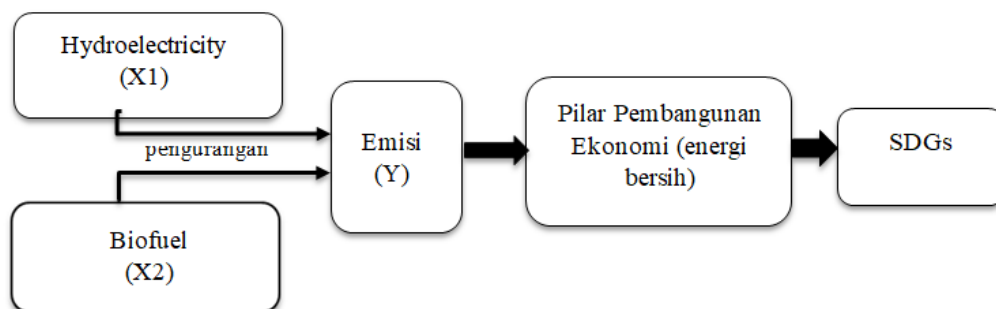
Descriptive quantitative is the most appropriate method to present the process in providing results in this study. Numbers are data that are very suitable for quantitative research. The data is then processed to determine the effect of renewable energy which in this context is hydroelectricity and biofuel on carbon dioxide emission levels.

3.1 Data Sources

The data of this study were taken from a second party who had processed and published the data so that the source of this research data is included in secondary data. The data used in this study were obtained indirectly through the bp Statistical Review of World Energy through the website <https://www.bp.com/en/global/corporate/energy-economics.html>

3.2 Variables

The independent variables in this study are Hydro electricity (X1) and biofuel (X2). Where both variables will affect emissions. The dependent variable of this study is Emissions (Y). Where this study will look at the influence of hydroelectric and wind power plants partially and simultaneously. Does each variable have an influence on the level of carbon dioxide emissions and see whether both variables also have a joint influence on the level of carbon dioxide emissions.



- H₀** : There is no significant influence of hydroelectricity and biofuel on carbon dioxide emissions .
- H₁** : Hydroelectricity has a positive effect on carbon dioxide emissions.
- H₂** : Biofuel has a positive effect on carbon dioxide emissions.
- H₃** : Hydroelectricity and Biofuel simultaneously have a positive effect on carbon dioxide emissions.

3.3 Data Analysis Techniques

The data was analyzed through testing based on the classical assumption test used to see whether the data was normally distributed or not. Then conducting a classical assumption test, multiple linear regression test and hypothesis testing.

4. RESULTS AND DISCUSSION

4.1 Normality Test

Based on the output above, it can be seen that the Sig. (2-tailed) value is 0.057>0.05. This means that the standardized residual value is stated to be normally distributed.

4.2 Paired Sample T-Test

The average level of emissions produced by hydroelectric power plants in Indonesia is only 0.1810 smaller than the average amount of emissions in Indonesia of 522.2600. This indicates that hydroelectric power plants only contribute very little emissions each year.

Based on the output results above, the significance value is 0.001 <0.05. So it can be concluded that H_0 is accepted and H_1 is rejected. Showing that hydroelectricity does not have a significant effect on emissions. This shows that renewable energy does not cause excessive emissions. Indicating that renewable energy has successfully contributed environmentally friendly clean energy.

Table 1. Normality Test Results

One-Sample Kolmogorov-Smirnov Test			
			Unstandardized Residual
N			10
Normal Parameters ^{a,b}	Mean	.0000000	
	Std. Deviation	30.10516336	
Most Extreme Differences	Absolute	.259	
	Positive	.259	
	Negative	-.166	
Test Statistics			.259
Asymp. Sig. (2-tailed) ^c			.057
Monte Carlo Sig. (2-tailed) ^d	Sig.	.058	
	99% Confidence Interval	Lower Bound	.052
		Upper Bound	.064

Table 2. Paired Sample Statistic Hydroelectricity Test Results

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Hydroelectricity	.1810	10	.03695	.01169
	Emission	522.2600	10	51.87809	16.40529

Table 3. Results of Paired Sample T-Test Hydroelectricity

Paired Samples Test										
		Paired Differences				t	d	Sig. (2-tailed)		
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
					Lower	Upper				
Pair 1	Emissions - Hydroelectricity	522.07900	51.85009	16.39644	484.98768	559.17032	31,841	9	<.001	

Table 4. Results of Paired Sample Statistic Biofuel Test

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Biofuel	57.1000	10	46.51511	14.70937
	Emission	522.2600	10	51.87809	16.40529

Table 5a. Results of the Paired Sample T-Test Biofuel

Paired Samples Test									
Pair	Emissions - Biofuel	Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
1		465.1600	30.63122	9.68644	443.24775	487.07225	48,022	9	<.001

Table 5b. F Test Results

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16065.136	2	8032.568	6,893	.022 ^b
	Residual	8156.888	7	1165.270		
	Total	24222.024	9			

The average level of emissions produced by hydroelectric power plants in Indonesia is only 57,1000, which is smaller than the average number of emissions in Indonesia of 5,222,600. This indicates that biofuels only contribute very little emissions each year.

Based on the output results above, the significance value is 0.001 <0.05. So it can be concluded that h0 is accepted and h2 is rejected. Showing that biofuels do not have a significant effect on emissions. This shows that renewable energy does not cause excessive emissions. Indicating that renewable energy has successfully contributed clean, environmentally friendly energy.

4.3 F Test

Based on the output results above, it is known that if the significance value is 0.022 <0.05, then H3 is accepted. X1 and X2 simultaneously have an effect on carbon dioxide emissions. If calculated from the average emissions produced, the average of X1 and X2 is 0.1810 + 57,100.0 = 57,100.1810.

So :

$$\frac{\text{Rata-rata } X}{\text{Rata-rata } Y} \times 100\% = \frac{57.100,0}{5.222.600} \times 100\% = 1.093\%$$

From the data above, it can be seen that the combination of the average hydroelectricity and biofuel variables only contributes 1.093% of the average emissions in Indonesia. Showing that renewable energy produces very little emissions and is very environmentally friendly. This is in line with the objectives of the SDGs programs, especially in the pillar of Economic Development which has the goal of Quality Economic Development and is realized through clean energy. Therefore, clean energy adapted from the principles of a green economy that is in line with maqashid sharia is considered to be able to help in realizing sustainable development goals .

5. CONCLUSION AND RECOMMENDATIONS

Based on the t-statistic test that has been conducted, it shows that each variable of hydroelectricity and biofuel has no effect on carbon dioxide emissions produced by various activities. However, if the F test is carried out, it can be seen that the variables of hydroelectricity

and biofuel together have an effect on carbon dioxide emissions, although the effect is only 1%. However, we can see that 99% of other variables outside this study are the largest contributors to carbon dioxide emissions. This makes the objectives of the SDGs can be achieved if the use of renewable energy is increased to continue to reduce carbon dioxide emissions.

The concept of a green economy that is in line with the principles of maqhasid sharia can play a role in realizing one of the pillars of the SDGs, namely the pillar of economic development through environmentally friendly clean energy. Based on the results of research on the role of sharia economics in realizing sustainable development based on a green economy, there are suggestions that need to be considered, namely:

1. Studies related to the role of sharia economics in reducing various emissions caused by various activities must be studied more deeply because sharia economics offers various healthy and environmentally friendly economic activities, one of which is by utilizing natural resources such as clean and environmentally friendly renewable energy.
2. Activities related to environmental sustainability must be considered because Allah SWT sent down humans as caliphs on this earth. We can be given the right to utilize the resources that Allah SWT has given. However, we must not forget our obligation to protect the earth as a form of appreciation for having been given abundant blessings by Allah SWT.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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