

Green Sukuk and Sustainable Economic Development Goals: Mitigating Climate Change in Indonesia

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Abstract

This paper aims to analyze the role of green Sukuk in the goal of sustainable economic development in Indonesia, more specifically in improving climate change mitigation. The research method used is descriptive qualitative. The study found that several renewable energy sectors can be funded by Green bonds/Sukuk, namely: sustainable management of natural resources, energy efficiency, green tourism, resilience to climate change, green buildings, sustainable transportation, sustainable agriculture, and waste management and waste energy. This study also found projects funded by the issuance of State Sukuk to be in compliance with Islamic regulations and have met the criteria for green infrastructure through the stages of project identification, project feasibility preparation and assessment, issuance of Green Sukuk, project implementation and completion, project monitoring and project evaluation.

Keywords: Sukuk, Green Bond, Sustainable Development Goals, Climate Change Mitigation

Introduction

The development of key targets for global sustainable development goals has entered its fourth phase since it was signed for the 2030 agenda, with countries committed to focusing on the vision of taking action to integrate goals and targets into their national development plans and aligning policies and institutions behind it in ending poverty, protecting the planet and ensuring that all people enjoy peace and prosperity, now and in the future (Morton, Pencheon, & Squires, 2017). In the 2019 sustainable development goals report (Affairs, 2019), it was mentioned in the Paris agreement on anticipating climate change that almost all countries have communicated their first nationally determined contributions, including Indonesia.

One of the goals set by the Government in the agenda of sustainable development goals (SDGs) in Indonesia is that the Government is committed to improving the environment, expressed as one of the 6 essential elements of SDGs, namely: planets, people, dignity, prosperity, justice, and partnerships. Gleaning at these six elements, the elements of people and dignity may be referred to as the social aspect of the SDGs, while prosperity and justice the economic. By extension, protecting the environment may be used as a way of building the condition of a dignified society, as well as of the economy. This can be read as a form of criticism of the logic of the kind of development that has not only damaged the environment but also resulted in social marginalization and economic injustice. SDGs aim at improving a given society through the logic of development that emphasizes cooperation and partnership between countries and between sectors. Poor environmental conditions are of course very difficult for people to get out of, especially in simultaneous conditions of poverty and hunger. Sustainable environment is closely related to the goal of sustainable development (Haider, Boonstra, Peterson, & Schlüter, 2018), where a healthy environment is a prerequisite for productive businesses, such as agriculture, which is generally still in demand by the lower classes of society. When the environment deteriorates, no productive agriculture can be made out of it. It also emphasizes the logic that the form of the agricultural economy that must be developed is sustainable agriculture, which is environmentally and socially friendly.

Indonesia has been among the pioneers of Islamic finance developers in the world. In meeting the objectives of its sustainable development goals, Indonesia has the potential to contribute through rapidly growing Islamic financial instruments, such as the Sukuk (Shari'a compliant bonds). It is listed as a pioneer in the issuance of green bonds in Southeast Asia. Indonesia reportedly issued US\$1.25 billion in Green Sukuk in March of 2018 (Finance, 2019).

This transaction marked the first time in the world that the Green Sukuk was issued by a nation (the world's first sovereign green Sukuk). In addition to further strengthening Indonesia's position in the global Islamic financial market, the issuance of the Green Sukuk is also a manifestation of Indonesia's commitment to the Paris Agreement which was ratified in 2016 to encourage Indonesia to become a lower carbon-emitting country and more resilient to climate change.

Most green financing has been based on conventional financial structures. This has made it vulnerable to financial market conditions (Kwoun, Abdul Azziz, & Kim, 2018). On the other hand, Islamic financing is generally viewed as being much safer and reliable. Therefore, the potential of Islamic financing to promote sustainable economic development through various approaches – like expanding access to finance (including microfinancing), financing infrastructure projects, and expanding the reach of asset-based Takaful (Shari'a-compliant insurance) and supported by Sukuk – is huge and promising (Ahmed, Ahmed, Hashim, & Islam, 2019). For that, as part of Indonesia's commitment to its SDG, the Islamic Development Bank has announced it will increase its funding of SDG-related activities through a ten-year strategic framework from the US\$80 billion recorded during the MDGs, to US\$150 billion over the next 15 years (2016–2030) (Sadiq & Mushtaq, 2015). One of the goals set by the Indonesian Government in its SDGs agenda is its commitment to eradicating all forms of poverty over the next 15 years. The target, to be achieved in 2030, requires that every Indonesian citizen will have access to basic services and have the right to enjoy a decent standard of living, and that the Government must be able to guarantee the very poor community with a social security program.

It is extremely important that Green Sukuk be realized in Indonesia. Indonesia is a country with high levels of vulnerability. About 80% of natural disasters that have occurred in Indonesia were of hydrometeorological in nature, caused by an increase in climate change. Also, Indonesia is the fifth-largest emitter of greenhouse gases in the world. In addition, Indonesia also faces the sudden dangers of flooding and drought. These in turn will further affect the Indonesian economy. Given these situations, this study seeks to investigate the

potential of Green Sukuk in Indonesia in supporting sustainable economic development, particularly in relation to mitigating the effects of climate change.

Research Questions

The following questions will guide this research study:

1. *What sectors have the potential to be funded by Green Sukuk in Indonesia?*
2. *What are the necessary stages to be found in projects financed by the issuance of State Sukuk for them to be considered to have complied with Islamic regulations and met the criteria for green infrastructure?*
3. *What impact will the development of Green Sukuk in Indonesia have on global sustainable economic growth?*

Literature Review

Sukuk

Sukuk is the plural for **sakk** (legal instrument, ownership mark or check), an Arabic term referring to the certificate of trust in Shari'a investment. In recent years Sukuk became popular in the capital market. During the heyday of Islam in the 13th century, sakk was known as a source of checks that were developed in Europe. *Sakk* then represented a contract or the right to a debt (Alsaed, 2012). Whereas according to the National Sharia Board Fatwa (Dewan Syariah Nasional), Sukuk is defined as long-term securities based on Shari'a principles, issued by issuers, to pay income to holders of Islamic bonds in the form of profit-sharing, margins, and fees, and to repay bond funds when due (Indonesia, 2002).

According to the Sukuk Negara Sharia (SBSN) Law, Sukuk are securities that are issued in Rupiah and foreign currencies based on Shari'a principles, as evidence of the investment in SBSN assets. A party that issues a state Sukuk must be a legal entity established under the provisions of the law to issue Sukuk. Its assets are state-owned goods that have economic values that are used as the basis for the issuance of state Sukuk.

Green Sukuk

Green Sukuk is a Shari'a-compliant investment vehicle that funds environmentally friendly projects such, as solar parks, biogas plants, and wind farms. The main objective behind the development of green Sukuk is to overcome the problem of the Shari'a having to protect the environment (Alam, Fethi, & Ariss, 2016). Alignment between Islamic ethics and environmental awareness is necessary. Market shows great potential when environmental sustainability is combined with Islamic capital markets (Moghul & Safar-Aly, 2014)

Issuance of Green Sukuk by the Government is almost the same as issuing other State Sukuks because current State Sukuks are mostly used to finance State infrastructures. It is just that in the case of Green Sukuk, the infrastructures that will be used as the bases for such sukuk issuance (underlying assets) must meet the criteria for green infrastructures. Infrastructures from the agricultural sector, such as the construction of reservoirs, irrigation, and hydropower are highly potential to be categorized as green infrastructures because they support the more efficient use of water (sustainable water management), reduce the use of groundwater for agriculture, and increase the use of non-fossil renewable energy.

Climate Change

The trends of climate change in Indonesia are caused by both human activities, such as urbanization, deforestation, industrialization, as well as natural activities, such as continental drift, volcanic eruptions, changes in the Earth's orbit of the sun, solar spots and El Niño. Environmentally sound development needs to pay attention to efforts in maintaining natural systems and needs to analyze the impact of development on climate (Kattumuri, 2018). The atmosphere above big cities and industrial regions feels hotter and dirtier by motor vehicle exhausts and gases and by industrial processes compared to the atmosphere above forest and mountain regions, which obviously feels cooler and cleaner.

Urban human activity injects several gaseous pollutants and small particles into the atmosphere. Some pollutants in the lower atmosphere, especially in the troposphere, can disrupt the radiation balance, which in turn, can

change the climate. Gas pollutants can affect the climate through the greenhouse effect. As an aerosol, pollutants change the radiation balance through scattering, reflecting and absorption, and cloud formation. As a result of washing aerosol sulfate and nitrate by cloud drops and rain, acid rain occurs which causes a decrease in pH values in soil and water. Aerosols can be divided into 2 according to their origin: primary aerosols (for example, sprinkling sea salt, blowing dust or volcanic ash), and secondary (natural and anthropogenic – dust from industrial or agricultural combustion processes) aerosols. Aerosols can influence climate change through scattering and absorption of solar radiation, and the emission of longwave radiation.

Methodology

Research Design

The research was designed using the descriptive, qualitative method. Included in the design the research observation comprising of three observations: the participant observation, the unstructured observation, and the unstructured group observation. Here data was collected through personal observation and sensing where the researcher was personally and directly involved in the daily lives of the respondents. Data was also gathered through unstructured observations where observations were made without structured guidelines. In addition, group observations were also made where groups of one or several objects were observed at once.

Data Analysis

Data obtained and collected from various sources were processed according to the following:

- a. Data were selected and grouped according to the need to answer the research problem.
- b. Data were processed according to the research problem.
- c. Data were analysed using simple words in response to the analysis.

Accordingly, the data collected were first analysed through categorization where categories of data were prescribed relevant to the research purposes. Subsequently, the collected data were processed and interpreted qualitatively to answer the research problem.

Results and Discussion

Based on the Green Bond model developed by the World Bank, the Government can develop Green Sukuks to support infrastructure development while simultaneously helping the carbon emission reduction programs. Infrastructure development in various sectors that is being intensively carried out by the Government has the potential of developing the Green Sukuks. The Government currently has an integrated infrastructure development program contained in the Master Plan for the Acceleration and Expansion of Indonesia's Economic Development (MP3EI). For this program to be in line with the carbon emission reduction program, it seems necessary to align the infrastructure development program in MP3EI with the green infrastructure concept. Some potential projects that can be categorized as green infrastructures are power plants – with renewable energy such as wind power, solar and geothermal energy, and mass transportation in big cities for commuters. Being categorized as green infrastructures, these projects can then receive financing support from the Government through the issuance of state Sukuks. The Green Sukuk can be a means of developing an investor base, simply because currently there are growing corporate and individual investors who are very concerned about environmental issues, especially in tackling climate change. Until now no country has published the Green Sukuk on the international prime market. If the Indonesian Government can expedite this effort, then Indonesia will be the first country to issue Green Sovereign Sukuk.

Based on the results of the analysis of the Indonesian Green framework, several sectors can potentially be financed by Green Bonds/Sukuk, including most of which are projects that fall into the renewable energy category namely, sustainable management of natural resources, energy efficiency, green tourism, resilience on climate change, green buildings, sustainable transportation, sustainable agriculture and waste, and energy management. These projects may be enumerated as follows:

1. Sustainable Management of Natural Resources

Environmentally Friendly Business Activities (KUBL). This was based on the determination of the International Capital Market Association

(APMI) regarding the principles of green bonds. Sustainable management of natural resources is the management of natural resources that can guarantee the fulfillment of current human or population needs without reducing their potential to meet future human needs. Sustainable management of natural resources must pay attention to the following matters:

- a. Meeting the present needs of the population, but does not sacrifice the needs of the population in the future.
- b. Do not exceed the carrying capacity of the environment (ecosystem).
- c. Optimizing the use of natural resources by aligning human needs and processing capabilities with the availability of natural resources.

Natural resources can be sustainable if managed natural resources are classified as renewable natural resources. Non-renewable natural resources are unsustainable resources because these resources are exhaustible. Natural resources that will deplete can only be saved in their use so that they can extend their useful life. The sustainable use of natural resources does not only concern the economic aspects and welfare of farmers, but also includes the preservation of natural resources and their relationship with the surrounding environment.

2. Energy Efficiency

Energy Efficiency is an effort made to reduce the amount of energy needed in using equipments or even an energy-related system. For example, house insulation allows the building to use less heating and cooling energy in order to reach and maintain a comfortable temperature. Installing fluorescent lamps (fluorescent lights), LED lights, or natural skylights can reduce the amount of energy needed to achieve the same level of illumination compared to using incandescent lamps. Improvements in energy efficiency are generally achieved by adopting more efficient technology or production processes (Mey, Diesendorf, & MacGill, 2016) or by a generally accepted application method to reduce energy expenditure.

The use of green Sukuk, in particular, may be used to finance renewable energy projects (Rahim & Mohamad, 2019). This helps motivate improving energy efficiency. Reducing energy use and reducing energy costs can result in

financial savings to consumers if the energy savings do not exceed the additional costs for implementing energy-efficient technology applications. Reducing energy use is also seen as a solution to reduce the problem of greenhouse gas emissions. According to the International Energy Agency, improving energy efficiency in buildings, industrial processes and transportation can reduce one-third of the world's energy needs by 2050, and can help control global greenhouse gas emissions.

3. Green Tourism

Green tourism (green tourism) is one form of ecotourism that focuses on sustainable tourism. It implies not causing damage to the tourist sites and cultural heritage being visited (environmentally friendly). Some of the activities undertaken include hiking, trekking, birding or birdwatching, snorkeling, and diving. According to UNWTO, "Green Tourism is environmentally sustainable travel to destinations where the flora, fauna, and cultural heritage are the primary attractions and where environmental impacts are minimized," (Pintassilgo, 2016). Green tourism is also understood as sustainable tourism, referring to tourism activities that can be maintained or sustained indefinitely in their social, economic, cultural and environmental contexts.

4. Green Building

Green buildings (also known as green construction or sustainable buildings) lead to the structure and use of processes that are environmentally responsible, and that save resources throughout the life cycle of the building from site selection to design, construction, operation, maintenance, renovation, and demolition. This practice expands and complements classic building designs in terms of economy, utility, durability, and comfort (Agency., 2009). Although new technology continues to be developed to complement current green structure creation practices, the main objective is that green buildings are designed to reduce the environmental impact of buildings on human health and the natural environment by (1) using energy, water, and other resources efficiently; (2) protect the health of occupants and increase employee productivity; and (3) reducing waste, pollution, and environmental degradation.

There is a similar concept called natural buildings which are usually smaller in size and tend to focus on the use of natural materials available in the surrounding area. Another concept is sustainable design and green architecture. Sustainability can be interpreted as meeting the needs of the current generation without reducing the ability of future generations to meet their needs. Green buildings do not specifically address the problem of renewing existing homes.

5. Sustainable Transportation

Sustainable transportation refers to the broad subject of sustainable transportation in terms of social, environmental and climate impacts. Components for evaluating sustainability include certain vehicles used for road, water or air transportation; energy sources; and infrastructure used to accommodate transportation (roads, railroads, airways, waterways, canals, and terminals). Transportation and logistics operations, as well as transit-oriented development, are also involved in the evaluation of sustainable transportation. Transportation sustainability is measured in large part by the effectiveness and efficiency of the transportation system and the environmental and climate impacts of the system (Mihyeon Jeon & Amekudzi, 2005). Short-term activities often encourage the gradual improvement of fuel efficiency and vehicle emissions control, while long-term goals include transportation of transportation from fossil-based energy to other alternatives such as renewable energy and the use of other renewable natural resources. The entire life cycle of the transportation system is subject to the measurement and optimization of sustainability.

Sustainable transportation systems make a positive contribution to the environmental, social and economic sustainability of the communities they serve. Transportation systems exist to provide social and economic connections, and people quickly take advantage of the opportunities offered by increased mobility, with poor households benefiting greatly from low-carbon transportation options. The benefits of increased mobility need to be considered against the environmental, social and economic costs incurred by the transportation system. Based on the definition of sustainable transportation from The Center of Sustainable Transportation Canada (2002), a sustainable

transportation system is a transportation system that is the main access needed by individuals and the community so that security is more secure, humane, does not pollute the environment, and provides justice both within and between generations; Can be operated efficiently; provide choices of transportation modes and support the movement of economic aspects; Limiting emissions, waste in the ability of the earth to absorb them, minimizing the use of non-renewable natural resources, limiting the use of renewable natural resources so that quality is maintained, using and renewing their parts, and minimizing land use and production that causes noise.

6. Sustainable Agriculture

Sustainable agriculture is an agricultural movement using the principles of ecology, the study of the relationship between organisms and their environment. Sustainable agriculture has been defined as an integrated system of plant and animal production practices in a location and the long-run has the following functions (Mary V. Gold, 2009) :

- Meet the needs of food and human fiber.
- Improving the quality of the environment and natural resources based on agricultural economic needs.
- Use non-renewable natural resources very efficiently.
- Use the resources available on agricultural land in an integrated way, and utilize biological controls and cycles if possible.
- Improving the quality of life of farmers and the community as a whole.

But the stage to sustainable agriculture is often seen as a stage and not as an end. Some consider that sustainable agriculture is economically sustainable which is achieved by less energy use, minimal ecological footprint, less packaged goods, expanded local purchases with short food supply chains, less processed foodstuffs, more community gardens, and home gardens, and so on.

7. Waste Management and Waste Energy

Renewable Energy focuses on the utilization of solar energy, the utilization of wind Energy, and the utilization of biogas. The program is held with the following objectives:

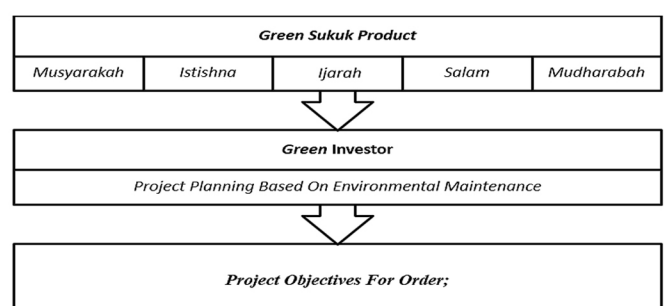
- Overcoming the problem of lack of electricity in remote areas.
- As a solution to reduce the use of fossil energy as a primary energy source for electricity generators.
- Overcome the energy crisis by providing cheap, friendly alternative energy environment based on empowered poor people.

Waste Management will focus on increasing the ecological, educational and economic value of waste management efforts. Creative and sustainable actions will be taken to increase community participation in efforts to manage waste and internalize clean and healthy lifestyle values.

8. Resilience to Climate Change

Green Sukuk that is applied for resilience to climate change must contain two standards, namely to fulfill the environmental awareness mandate and the Shari'a compliance of several SDGs goals. This is an anticipation of climate change that can lead to various disasters and damage the environment.

Sukuk is the most widely used Islamic financial instrument for project financing. This is generally an investment certificate that allows investors to pay returns related to the performance of the underlying project by repaying the invested capital initially according to the agreed schedule (Boutti & El Mosaïd, 2015). At the basic level, the selection of project categories that qualify is the main mechanism for ensuring that projects provide environmental benefits. Through the selection of project categories with clear environmental benefits, Green Sukuk aims to provide certainty to investors that their investment provides environmental benefits as well as financial benefits. The Green Sukuk principle states that "the overall environmental profile" of a project must be assessed and that the selection process "must be well defined".



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| • Sustainable Management of Natural Resources |
| • Energy Efficiency |
| • Green Tourism |
| • Green Building |
| • Sustainable Transportation |
| • Sustainable Agriculture |
| • Waste Management and Waste Energy |
| • Resilience to Climate Change |

Figure I: The Sukuk Green Process in Mitigating Climate Change

Based on the above, Islamic Sukuk financial instrument products are directed to project planning based on environmental maintenance in the context of the main objectives of food security, flood mitigation, drought management, and public health management. An important effort for climate change adaptation and mitigation actions is to build infrastructure and carry out environmental oriented projects (Eligible Green Sectors). Renewable energy projects can support Islamic finance in attracting investors seeking portfolio diversity. These investments include investment in equipment and systems that enable the use of energy from renewable resources, such as solar, wind, water, biomass, geothermal and tidal efficiency. Besides, it can also be an investment in equipment, systems, products, and services that help reduce energy consumption, such as reducing transmission and distribution losses by producing energy-efficient motors. Funds from the sale of Green Sukuk will be allocated to finance projects that are in the green category.

For projects financed by the issuance of State Sukuk to be following Islamic regulations and meet the criteria for green infrastructure, several stages need to be undertaken by the government in implementing the program:

- a) Project identification: the process at this stage is to ensure that the project to be implemented is in line with national development priorities and meets the criteria for a project that supports the reduction of carbon emissions and the effects of climate change. This identification can be done by the government agency that will implement the project. This identification process resulted in several projects proposed at a later stage;
- b) Preparation and Assessment of Project Feasibility: the results of identification in the first stage are followed by the preparation of a project feasibility study by the government agency as the project implementer. Furthermore, the feasibility study is assessed

by authorized government agencies (e.g. Bappenas) or in collaboration with independent institutions that have expertise in their fields. Also, in this stage of assessing the suitability of the project with Shari'a criteria, the Government could ask DSN MUI to give its opinion. If it meets the criteria, the project can then be proposed to be financed through the issuance of State Sukuk in the APBN under applicable regulations;

- c) Issuance of Green Sukuk: after the project is budgeted in the APBN, the Government must provide funding for the project. Issuance of State Sukuk to finance Green Infrastructure can follow the mechanism of issuance of State Sukuk to finance projects that have been running since 2012; and
- d) Project Implementation and Completion: project implementation is carried out by relevant regulations, for example through the bidding and project completion process under the planned stages. Likewise, the replacement of funding to Government partners follows the existing project financing rules.
- e) Project Monitoring: project monitoring is carried out from the time the project starts until the completion of the project which aims to monitor the progress of the project which is then regularly reported. This activity is carried out by an authorized government agency or an independent organization assigned by the Government. Monitoring can be done according to government needs.
- f) Project Evaluation: to ensure that the project has proceeded according to plan, including the bidding process, financial management, benefits and impacts of project implementation as well as the sustainability of the project the evaluation activities are carried out. This activity can provide input for the sustainability of the project in the future. Evaluations are carried out by authorized government agencies or independent organizations that are assigned by the government.

Conclusion

Green Sukuk as one of the Shari'a financial instruments can support the realization of sustainable development goals (SDGs),

especially related to the handling of climate damage. The presence of Green Sukuk instruments in Indonesia is also a breakthrough in realizing the commitment to address the problem of climate change. To support the program, Green Sukuk issued is prioritized to finance government projects that directly or indirectly contribute to achieving the SDGs agenda. Green Sukuk issued at least one can contribute to one sector among the renewable energy sectors such as energy efficiency, reducing disaster risk, sustainable transportation, waste management or waste energy, sustainable management of natural resources, green tourism, green buildings, and sustainable agriculture.

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