

Green Economy and Some Relevancies from Islamic Finance Perspective

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The green economy is one of the new economic concepts still popular in research, emphasizing the balance between economic and environmental dimensions. The green economy concept is in line with the existing concept of Islamic finance. As a new concept, research related to a green economy is also developing. Therefore, this study aims to provide qualitative information on the development of green economy literature. There are 1183 papers in journal articles, book chapters, and conference papers indexed by the Scopus database from 1961-2021. We employed VOSViewer and Excel software to synthesize and analyze the data. This research is limited to the Scopus database related to the green economy. In addition, we identified the relevancies between the green economy and Islamic finance, and some research has been discussed these issues. Regarding the result obtained, we found that the rules in Islamic finance support the implementation of the green economy concept. Furthermore, we also found sukuk as a potential instrument in Islamic finance that can be utilized to promotes the green economy concept.

Keywords: Green economy; Islamic Finance; Sustainable Development; Bibliometric; Sukuk

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INTRODUCTION

The green economy concept that emerged from environmental economics has become increasingly influential in government policy and decision-making over the past few years. At first, this concept did not receive wide acceptance. Nevertheless, with the outbreak of the financial crisis in 2007 and the failure of most countries to move on the path of sustainable development, it became clear that the current development paradigm was not delivering the desired results in all economic, social, and environmental areas. The green economy concept started from the United Nations Conference on Sustainable Development (Rio20+), which several countries attended to build a consensus that supports sustainability programs and coined the green economy concept.

The United Nations Environment Program (UNEP) defines green economy as one that improves human well-being and social (UNEP, 2011). The term green growth is sometimes interchangeably used to define the green economy, as proposed by Organization for Cooperation and Development (OECD) and World Bank (Loiseau et al., 2016). The green economy is expected to be a pathway to sustainable development and a reduction tool for poverties in a global context (UNEP, 2011).

Several diverse studies discuss the green economy concept. The green economy concept is often associated with various other dimensions, such as investment, technology, industry, and many others. Interestingly, the green economy concept aligns with the Islamic financial instruments that can boost the implementation—sukuk, especially one of the instruments in Islamic finance that has been discussed in few studies.

For example, in 2018, Indonesia was successfully issued the world's first sovereign green sukuk, worth USD \$1.25 billion. This initiative was part of the ambitious target of Indonesia to strengthen its commitment to the climate change problem. The structure of the sukuk was using wakalah contract. Continued in 2019, Indonesia consistently issued the second green sukuk using the same wakalah contract (Siswanto & Surya, 2021). This is proof that Islamic finance through green sukuk contributes to supporting the green economy concept.

The green economy concept is also in line with the principle in Islamic finance; mizan (balance) (Al-mubarak & Goud, 2018). As a new branch of the economy that is still popular, research related to the green economy is also growing with different dimensions, methodologies, and goals. Therefore, it is a good moment to synthesize and harmonize the existing literature to fully comprehend all of the issues raised in the context of the green economy. This study aims to conduct an extensive literature review by identifying research developments related to the green economy using a bibliometric approach. In addition, this study observed the relevancies between the Islamic

finance perspective and green economy from related research.

The remainder of this research is structured as follows: chapter 2 discusses the literature review, chapter 3 discusses methodology, chapter 4 covers the analysis and results of this research, and the last chapter 5 concludes the research.

LITERATURE REVIEW

Green economy theories and practices are crucial to current discussions about the sorts of economic and societal restructuring necessary to attain environmental sustainability, carbon reductions, social justice, and stable economies. The capital misallocation tendency fostered the creation of the green economy. Although the roots of these crises vary, they always have one thing in common: a huge misallocation of capital. In the last two decades, property, fossil fuels, and structured financial assets with embedded derivatives gained a lot of money, but renewable energy, energy efficiency, public transit, sustainable agriculture, ecosystem and biodiversity protection, and land and water conservation received comparatively little.

The concept of the green economy depicts a radical shift toward a more balanced aspect of the new economy, which aims to create a comprehensive prevention of climate change but still consider the economic dimension (Janicke, 2012). Furthermore, scholars associate green growth and green economies to the ecoindustry sector's prospective developments, such as the transition from downstream environmental safety technology to resource-saving technologies, which is based on innovation and competitive markets (Janicke, 2012).

The concept of green economy itself rise from the global financial crises in 2008-2009. The international consensus on green economy came from anxiety of the economic recession, inequalities and climate change (Davies, 2013). This concept firstly introduced by Pearce et al (1989) and after 2009, the green economy evolved into a broader policy framework. In 2012, the United Nations Conference on Sustainable Development (UNCSD, or Rio+20) was a focal point for the green economy internationally. As a result, the conference recognized that countries are confronted with climate-related risks and increased competition for environmental assets. Through sociocultural, economic, and environmental movement, a shift from a brown to a green economy must be made to support sustainable development. During the build-up to Rio+20, there was cautious optimism that the conference would provide enough progress to offer the notion the required political and financial support, or at the very least acknowledgment of a more important position in international policy discussions

In a green economy, private and governmental investments that decrease carbon emissions and pollution, improve energy and resource efficiency, and

avoid the loss of biodiversity and ecosystem services can potentially drive income and employment development. In order to promote these investments, targeted state expenditure, policy initiatives, and regulatory adjustments are required. In addition, achieving the success of green economy implementation requires maintenance, enhancement, and innovative alternative of the environmental asset (UNEP, 2011).

Research related to the green economy is very diverse, but there are still very few studies that use bibliometric methods to the author's knowledge. However, only Loiseau et al., (2016b) conducted research on the green economy with a bibliometric approach. Loiseau et al. (2016b) identified several research keywords with the term green economy derived from the Scopus database. The data they use comes from 1990. Their research shows that a semantic field that often appears and is relevant to the environmental dimension. In addition, the most frequently used keywords related to the green economy in research are green economy' itself, followed by 'sustainable development' and 'resources. Loiseau et al., (2016b) also developed a framework of the green economy concept and discussed the impact of the green economy on sustainability. The use of the bibliometric approach in his research was only a complementary part.

RESEARCH METHOD

This study uses data on publications of papers sourced from various journals from 1899 with research on the theme of green economy. For data collection, we search for green economy articles that indexed by Scopus. From the search results, there are 917 works of literature published from 1899-2021. We analyze the trend of publication development on the green economy using VOSViewer software.

Bibliometric studies in information science can reveal patterns of document use, development of literature, or sources of information in a subject area. Bibliometrics includes two types of studies, namely descriptive studies, and evaluative studies. Descriptive studies analyze the productivity of articles, books, and other formats by looking at authorship patterns such as the gender of the author, the type of work of the author, the level of collaboration, the productivity of the author, the institution where the author works, and the subject of the article. Evaluative studies analyze the use of literature made by counting references or citations in research articles, books, or other formats (Pattah, 2013). Table 1 provides details regarding the process and a description of each stage for the stages in this bibliometric research.

Table 1: Stage of Bibliometric Research

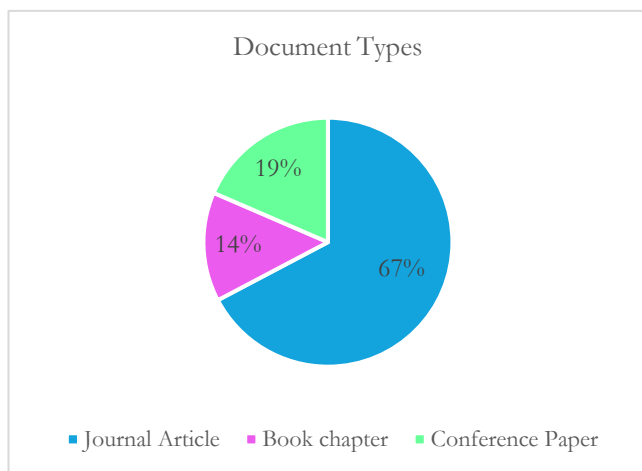
No	Stage	Process
1	Selection of the object of analysis and scientific basis	(a) Determine the scientific and theoretical fields of the work (b) Limit the research objectives (c) Select the scientific basis on which the research of the article will be carried out
2	Searching procedure	(a) Define the terms (b) Select software for advanced searching (c) Select filters
3	Collecting and compiling data	(a) Choose a reference manager software (b) Define bibliometric analysis software (c) Download references from reference managers, bibliometric and electronic spreadsheet formats (d) Import files to reference management software
4	Contextual analysis of scientific outputs to samples	(a) Analysis of the authorship (b) Analysis of selected article citations (c) Analysis of the country of origin of the selected articles (d) Keyword analysis of the selected articles (e) Analysis of the scientific field of the selected articles
5	Citation network analysis performed by sample	(a) Detailed (complete) keyword analysis (b) Research analysis of future directions (c) Methodological classification & nature of articles

Source: Adjusted from Costa et al. (2017).

RESULT AND DISCUSSION

Figure 1 below shows the collection of documents used in the research with the theme of green economy. Of the total 1183 papers used, the classification contains five types of documents, including journal articles (796 documents), book chapters (168 documents), and conference papers (219 documents).

Figure 1: Document Types



Based on Figure 1, the types of documents that most widely used document types as research subjects with the theme of green economy are journal articles with a percentage of 67%. On the other hand, book chapter classified as the document type that published the least literature about green economy with a percentage of 14%.

Bibliometric Graph Analysis

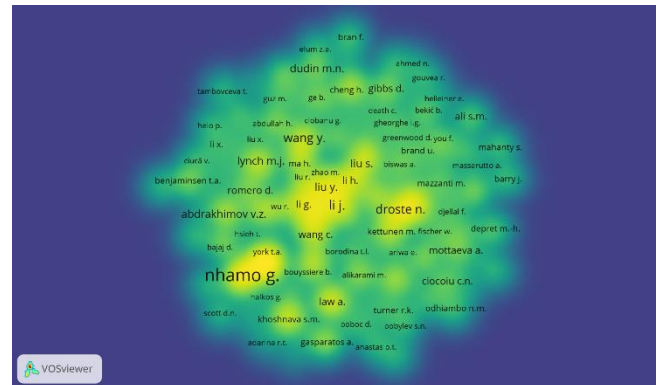
Bibliometrics is based on the calculation and statistical analysis of scientific outputs in articles, publications, citations, patents, and other more complex indicators. It is an essential tool in evaluating research, laboratory and scientist, scientific specialization and country performance. After establishing the background for bibliometric development, the report presents the database from which the bibliometric was created and the main indicators used.

This section presents a visual mapping chart of 1183 green economy publications to explore the meta-analysis results. The results of the keyword mapping analysis become the basis for mapping together important or unique terms contained in certain articles. Mapping is a process that enables one to recognize elements of knowledge and their configuration, dynamics, interdependencies, and interactions. Strictly speaking, science mapping is a method of visualizing the field of science. This visualization is done by making a landscape map that can display topics from science (Royani et al., 2013). The results of word map visualization with the theme of green economy are as follows:

Co-authorship Authros

To enrich our analysis, we presented the author's bibliometric mapping as seen in Figure 4. Figure 4 interpret that the bigger the shape and the brighter the color indicates, the more the author publishes his writings related to green economy.

Figure 2: Co-authorship Authors



In Figure 2, the appearance of cluster density depends on the level of yellow light brightness. This identifies that the yellow color on the map depends on the number of literatures associated with others literature. This section is useful for getting an idea of the general structure of a bibliometric map by taking into account to which parts of the light are considered important to analyze.

In general, each researcher has different tendencies. Some writers are indexed as a single author, others co-author with other researchers so that multiple clusters appear, which are indicated with different densities. However, authors with a fairly large density indicate that they publish more research on the theme of green economy. This result can be a reference for future researchers. Based on this result in Figure 2, the author with the highest publications on green economy is Nhamo G.

Co-authorship Institution (Co-citation)

In bibliometric analysis, we observed the institutions with the highest publications on green economy. Figure 3 presents the details of co-authorship institution.

As shown in figure 3, the cluster of institutions with large circles indicates that this institution considered to be the most productive in publishing papers with the theme of green economy. The most popular institution is calculated from the number of publications and links to links to other institutions, where an author can write many papers in different journals. Regarding to result obtained, the most popular institutions with the highest publications literature on green economy is Altai State, Barnaul, Russian Federal.

Table 2: Keyword Clusters

Cluster	Keywords
Cluster 1 (Red)	alternative energy, carbon dioxide, carbon emission, climate change, co2 emission, costs, economic activities, economic analysis, economic conditions, economic impact, education, emission control, employment, energy, energy efficiency, energy policy, energy resource, energy use, energy utilization, environment policy, european union, fossil fuel, global economy, global warming, green energy, green jobs, green house gas, gross domestic product, india, international trade, policy analysis, policy implementation, policy making, public policy, renewable energy, renewable resource, taxation, and United States.
Cluster 2 (Green)	Africa, agriculture, bioeconomy, capitalism, conceptual framework, decision making, developing world, ecological economics, economic growth, economic system, ecosystem service, ecosystems, engineering research, environmental economics, forestry, governance approach, green economy, investment, local government, natural capital, neoliberalism, numerical model, Philippines, policy, political economy, South Africa, strategic approach, sustainability, sustainable development, system dynamics, system theory, United Kingdom, United Nations, and waste management.
Cluster 3 (Blue)	Circular economy, commerce, competition, development, ecology, economic growths, economy, emerging economies, energy conservation, environmental problem, environmental regulation, environmental sustainability, environmental technology, finance, green, green manufacturing, green supply chain, green supply chain management, industrial ecology, industrial economics, industrial engineering, industry, information management, logistics, manufacture, manufacturing, marketing, optimization, profitability, recycling, supply chain management, supply chains, and transitions.
Cluster 4 (Yellow)	Article, Brazil, carbon footprint, China, conservation of natural, economic aspect, economic development, efficiency, empirical analysis, environment, environmental protection, environmental regulation, green chemistry, green technology, human, innovation, natural resource, pollution, productivity, technological development, technology and urban development.
Cluster 5 (Purple)	Buildings, carbon, construction theory, developing countries, economic and social effect, economics, energy resources, environmental impact, environmental management, environmental pollution, gas emissions, green building, greenhouse gases, investment, life cycle, low carbon economy, planning, regional economy, regional planning, regression analysis, renewable energy resource, and urban growth.
Cluster 6 (tosca)	Green finance, green growth, integrated approach, Russia, and Russian federation
Cluster 7 (orange)	Biodiversity, performance assessment, stakeholder, and tourism

The keywords that are divided into 7 clusters are arranged in colored circles that show cluster indicators. This data can be used to find out the trend of keywords in the last year. The bibliometric analysis shows several widely used keywords in the papers, which are the object of research. The more keywords that appear, the larger the circle is shown. Meanwhile, the line relationship between keywords indicates how much they are related to other keywords.

Co-occurrence Index

In addition, this study generates an index of words that are often used by authors and are interrelated in the green economy, as shown in the image below. An index that has the same color indicates a very close relationship.

economic sector in Bangladesh, they proposed a solar mini cold storage using renewable-energy based. Since the concept of a green economy positively supports the circular economy and SDGs agenda, they encouraged green sukuk to be utilized to mitigate the climate change problem. Richardson (2020) compared the development of responsible sukuk (including green sukuk) in some countries with the Uni Arab Emirates. His study shows that the Uni Arab Emirates struggled to promote green sukuk due to some problems, such as lack of practical actions, internal sustainability program, legal and

guidance framework. Aassouli et al. (2018) provided the roadmap for Sub-Saharan Africa (SSA) to mitigate climate change and achieve SDGs by using green sukuk as the tool to fill the financing gap for green projects. Lastly, Abdullahi (2020) recommended some Islamic finance products to be considered for policymakers in OIC countries to solve deforestation issues. The result argued that green sukuk and cash waqf could be helpful to finance the afforestation program. Table 3 summarize the relevancies between the green economy and Islamic finance.

Table 3: Green Economy research in the light of Islamic Finance

No	Title	References	Relevance
1	Shari'ah compliance finance: A Possible Novel Paradigm for Green Economy Investment in Italy	Campisi et al. (2018)	The research proposed the utilization of green sukuk, as a financial instrument that represents the green economy in the context of Italian to finance wind energy sector. The result shows that in the same cost Islamic finance, through green sukuk, create better profitability and bankability rather than conventional finance.
2	Contribution of Islamic Social Capital on Green Economic Growth in Malaysia	Hamid et al. (2019)	The findings of this research show that Islamic finance instrument, through Zakat, contributes to green economic growth in the short run and long run.
3	Green Investment and Sustainable Development: The Case of Islamic Finance	Al-Roubaie & Sarea (2019)	Islamic finance provides an environmentally friendly financing system that endorsed ethical investment activities which support the green economy. The research mentioned a green sukuk as Islamic finance instrument to build green economy.
4	Reforming Islamic Finance for Achieving Sustainable Development Goal	Khan (2019)	The research mentioned that sukuk, as one of Islamic finance instrument, can be a solution to counter the sustainability gaps. By designing a green project, sukuk potentially can reduce the gap to achieve sustainable development goals (SDGs).
5	Green Sukuk-Based Project on Sustainable Waste Management in Indonesia	Hariyani & Kusuma (2020)	The green sukuk can be used to finance sustainable waste management in Indonesia.
6	Islamic Social Finance and Green Finance to Achieve SDGs through Minimizing Post Harvesting Losses in Bangladesh	Julia et al. (2020)	The innovation of solar based cold storage proposed in this research aims to solve post harvesting losses and achieve SDGs, in the case of Bangladesh. This research suggest a green financing scheme through Islamic social finance as a financing vehicle.
7	The Role of Islamic Finance in Fostering Circular Business Investments: the Case of OIC Countries	Ibrahim & Shirazi (2020)	To support and create a circular economy, harmonization is needed between the business model of financial institutions and the sustainable development concept. Since Islamic finance aligns with sustainable finance, Islamic finance provides a varied set of instruments for climate finance. Debt-based, sale-based, partnership-based,

			and green sukuk can be financing infrastructure.
8	The UAE and Responsible Finance—Can Responsible Finance Şukūk Help the UAE in Fulfilling Its Sustainability Ambitions	Richardson (2020)	As the responsible finance sector, including green finance, recently has grown, the UAE initiated promoting responsible finance through Islamic finance instruments; green Sukuk. However, there are lots of aspect to be improved, especially for providing right legal and guidance framework.
9	Green Sukuk, Energy Poverty, and Climate Change: A Roadmap for Sub-Saharan Africa	Aassouli et al. (2018)	The research highlighted the role of Islamic finance as a tool for financing the sustainability projects (specifically renewable energy projects) through green sukuk.
10	Financing Afforestation in the Organization of Islamic Cooperation Countries: What Role for Islamic Economics and Finance?	Abdullahi (2020)	The research investigated the role of Islamic economics and finance to address the deforestation issue in Organization of Islamic Cooperation (OIC) member countries. This research promoted the role of green sukuk and cash waqf as a financing model for afforestation program.

CONCLUSION

This study aims to determine the extent of the development of the green economy research. From 1961 to 2021, the statistics reveal an increasing trend in publication research on this topic. On this topic, over 1000 papers have been published. Bibliometric mapping visualization shows that Nhamo G. wrote the most about green economy. The country that published with the highest literatures related to green economy is China. The institution that publishes the most papers related to green economy is Itai State University, Barnaul.

The green economy research development map is classified into 7 clusters. Cluster 1 consists of 42 topics, cluster 2 consists of 36 topics, cluster 3 consists of 33 topics, cluster 4 consists of 24 topics, cluster 5 consists of 24 topics, cluster 6 consists of 6 topics, and cluster 7 consist of 4 topics. In the word index with the theme of green economy, 'green economy' is the most widely used word.

However, our study has the following limitations: first, our data collection is limited to one indexing database, Scopus. Second, we come across some irrelevant literature, therefore our data selection is based on the authors' wisdom. Some literature with a tangential link to the green economy is discarded. We only collect data from journal articles, books and book chapters, conference papers, and review papers.

This study presents the current status of green economy research. Additionally, we investigated the relevancies between green economy and Islamic finance. It is interesting to reveal that the Islamic finance recognized the same principle with green economy: environmental protection and balance. However, there are still few studies discussed the green economy and

Islamic finance at the same time. Therefore, further research can address this issue with a different level complexity. This study try to contribute for the advancement of green economy, both in practice or academic. Future research can develop scientific research on the theme of green economy, especially by utilizing bibliometric results in this study. For example, using popular keywords, selecting references based on the most popular authors, institutions, countries, keywords, and indexes. Academics can also expand their review of the green economy literature with other reference, such as using Web of Science as database or use other software to produce more diverse bibliometric mappings, such as R Biblioshiny.

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