

Financial Transformation? Integrating Environmental Sustainability through Green Sukuk as a Means for Sustainable Development in Indonesia

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ABSTRACT

This study examines Green Sukuk in Indonesia through a postmodern analysis approach, focusing on sustainability in Islamic finance. Utilizing a literature review method, this research gathers and analyzes relevant academic sources to understand how Green Sukuk has been integrated into the framework of Islamic finance and how it contributes to environmental sustainability goals. This study critiques traditional views and meta-narratives in conventional finance and explores how Green Sukuk reflects the sustainability values embedded in the culture and financial practices in Indonesia. The analysis shows that Green Sukuk represents a unique synthesis between Sharia principles and sustainability aspirations, offering a new perspective in both global and local financial discourse. Through a postmodern lens, this research highlights the importance of cultural and religious contexts in the interpretation and implementation of sustainable finance, and provides recommendations for further research that can deepen this integration. In a global financial framework that increasingly emphasizes sustainability issues, Green Sukuk has emerged as a significant innovation in Islamic finance that links Islamic investment principles with the urgent needs of sustainable development.

INTRODUCTION

The world has faced increasingly complex challenges related to environmental sustainability. In efforts to address these issues, the concept of sustainability has been integrated across various sectors, including finance (W. Liu et al., 2024). One notable innovation in sustainable finance is the development of Green Sukuk, an Islamic financial instrument designed to fund environmentally friendly projects. In Indonesia, the use of Green Sukuk has garnered special attention due to its alignment with Islamic principles and its commitment to sustainable development (Leena Haniffah et al., 2023). The importance of a Sharia-compliant economic sector and broader empowerment through Islamic economic principles is evident. One role of Islamic economics is the principle of *Falah*, which involves reshaping economic strategies to promote socio-economic well-being in alignment with sustainable development goals (Anggara et al., 2024). *Falah*, which means holistic success or prosperity in the Islamic context, emphasizes well-being that is not only material but also spiritual and social (El-Bassiouny, 2014). The principle of *Falah* recognizes the importance of maintaining balance and harmony with nature, aligning with the goals of sustainable development (Sauri et al., 2022). Islamic economics encourages practices that are sustainable and responsible towards nature, in line with the concept of *Khalifah* or the wise stewardship of natural resources. The importance of supportive policies to strengthen connections in the green financial market and to support the growth of a sustainable market through greener and more sustainable financial instruments is highlighted (Primambudi, 2024).

In the context of Indonesia, the development and implementation of Green Sukuk not only supports environmental sustainability but also offers significant economic opportunities. Green Sukuk in Indonesia demonstrates how Islamic economic principles can be integrated with modern financial strategies to produce solutions that positively impact both the economy and the environment (Pirgaip et al., 2021). For example, projects funded through Green Sukuk often include the development of green infrastructure, renewable energy, and carbon emission reduction initiatives, which not only support sustainable development but also promote local economic growth.

Furthermore, as the country with the largest Muslim population in the world, Indonesia has a unique capacity to lead in the global Islamic financial market, particularly in the sustainable finance sector. This positions Indonesia to set international standards in the implementation and regulation of sustainable financial instruments like Green Sukuk, while advancing the values of sustainability and social welfare promoted in Islamic economics (Patel et al., 2022). Through this approach, Indonesia not only strengthens its local economy but also makes a significant contribution to global efforts in addressing today's environmental sustainability challenges.

The strategic use of Green Sukuk aligns with Indonesia's national development goals, which emphasize environmental stewardship and economic inclusivity (Boukhatem, 2022). The role as a trailblazer in Islamic finance, Indonesia can attract international investments that are ethically aligned and environmentally conscious, further boosting its economic sectors

that are critical to sustainable growth. The success of Green Sukuk in Indonesia also serves as a model for other nations, especially those within the Islamic world, to emulate. This not only enhances Indonesia's standing in the international arena but also promotes broader adoption of sustainable practices across the global financial landscape. Thus, through its pioneering efforts, Indonesia is shaping a future where financial investments and environmental responsibility go hand in hand, paving the way for a more sustainable and equitable world economy (Çokgezen & Kuran, 2015).

The implementation of Green Sukuk in Indonesia presents opportunities to enhance awareness and education about the importance of sustainable finance among the broader public. Educational programs and awareness campaigns can be developed to encourage the community and investors to participate in financing projects that support sustainability (Billah, Hadhri, et al., 2024). This not only increases literacy in Islamic finance but also helps the public understand the positive impacts of socially and environmentally responsible investments. Thus, Green Sukuk is not just a financial instrument but also a tool for empowerment that helps strengthen the foundation for a greener and more inclusive economy in Indonesia (Siregar et al., 2023). Through this initiative, Indonesia has significant potential to inspire positive changes in global financial practices, making sustainability a core component of future economic activities.

The success of Green Sukuk in Indonesia could catalyze similar initiatives in other countries, especially those with significant Muslim populations looking to incorporate Sharia-compliant financial solutions that also address environmental concerns (Cardona Santos et al., 2023). As a leader in this field, Indonesia can provide valuable insights and methodologies that can be adapted to local contexts worldwide, promoting a more global uptake of sustainable Islamic finance practices (Tahiri Jouti, 2019). This international influence not only enhances Indonesia's reputation as an innovator in financial sustainability but also contributes to the global effort towards achieving the United Nations Sustainable Development Goals. The collaborative opportunities stemming from Indonesia's pioneering work in Green Sukuk could lead to partnerships across countries, enhancing economic resilience and environmental sustainability on a global scale (F. H. M. Liu & Lai, 2021).

Despite increasing popularity and acceptance of Green Sukuk in Indonesia, there remains significant room to explore how this instrument is understood and interpreted within a broader social, cultural, and economic context. Most existing literature tends to focus on the financial aspects and Sharia compliance of Green Sukuk, with little emphasis on the profound socio-cultural implications. Evaluating this is crucial because the long-term success of Green Sukuk depends not only on its financial stability but also on how it is received and utilized by the general public (Araminta et al., 2022).

Therefore, there is an urgent need to integrate anthropological and sociological approaches into the research on Green Sukuk. Expanding research into the social and cultural aspects of Green Sukuk also means acknowledging and integrating diverse perspectives from across the entire spectrum of society. This can be achieved by hosting discussion forums that involve stakeholders from various backgrounds. These forums can serve as a platform to explore

how values of sustainability and social justice are articulated in sustainable investment practices, and how well these practices align with the expectations and needs of the community.

Furthermore, education and training on the principles of sustainability integrated within Green Sukuk should be enhanced. This could include the creation of educational materials targeting schools, universities, and also training for professionals in the financial sector. By increasing awareness and understanding of how Green Sukuk works and its benefits, it can help reduce skepticism and build greater trust within the community. Comparative studies with other countries that have successfully implemented similar sustainable financial instruments can also provide valuable insights. This not only shows what has been successful and what has not but also provided a perspective on how the adaptation of these instruments can be tailored to the social and economic context of Indonesia.

The involvement of these various parties will help ensure that the policies and initiatives taken truly reflect the needs and aspirations of the community, and that the social and environmental impacts of this instrument are measured and accounted for transparently and effectively. In this way, Green Sukuk will not only be a symbol of financial innovation but also a unifying tool that supports the goals of sustainable and inclusive development in Indonesia.

LITERATURE REVIEW

Green Sukuk

Indonesia initiated the issuance of sovereign green sukuk, a pioneering move as it was the first of its kind globally (Billah, Alam, et al., 2024). These financial instruments are designed to fund projects that tackle climate change and help achieve the Sustainable Development Goals. To date, Indonesia has released five such sukuk, accumulating a total of \$3.23 billion. The proceeds from these issuances are allocated to five specific areas: sustainable transportation, energy efficiency, renewable energy, waste-to-energy projects and waste management, and enhancing climate resilience in regions vulnerable to disasters.

Green bond markets in emerging economies have expanded significantly, financing eco-friendly projects like renewable energy, green housing, and low-emission transportation (Fahad & Khan, 2022). Experts in Islamic finance, including scholars and financial practitioners, alongside environmental think tanks, find a natural alignment between Islamic finance and green finance, both aiming to direct investments towards environmental benefits. Islamic principles such as Wasatiyyah emphasize moderation and caution against extravagance, waste, and corruption to maintain mizan, or the natural balance of the world (Rahman et al., 2020). Furthermore, Islamic teachings prohibit activities that cause chaos or harm, such as environmental damage, through fasad. They also forbid unethical financial practices including interest (riba), ambiguous or deceptive agreements (gharar), and gambling (maysir). This ethical framework mandates that businesses meet human needs sustainably and efficiently (Siswanto, 2018). Hence, financial activities that disrupt environmental harmony are considered illegal. In this context, Islamic scholars advocate for

Islamic finance to play a pivotal role in promoting environmental conservation and addressing climate challenges. Green sukuk, embodying economic, environmental, and Islamic values, could address various issues faced by green finance.

Green Economy

The fundamental ideology behind the Green Economy is to harmonize economic progression with environmental protection. This model diverges from traditional economic frameworks that often exploit natural resources with little regard for future repercussions. Instead, the Green Economy emphasizes sustainability, aiming to safeguard that today's economic activities do not hinder the prospects of future generations (Islam et al., 2023). A distinctive characteristic of this sustainable model is its forward-thinking outlook. It moves beyond mere immediate profits, advocating for strategies that promote long-term resilience and prosperity. This approach involves making prudent decisions today that will benefit the planet's long-term health and vitality, ensuring that human endeavors coexist peacefully with nature (Mohd Roslen et al., 2021).

The comprehensive nature of the Green Economy is one of its major strengths. It thoroughly considers economic, social, and environmental aspects, acknowledging their interdependence. A robust and sustainable economy must cater to each of these facets, reinforcing the notion that economic success cannot be isolated from societal well-being and environmental health. Efficient resource utilization is another key component, aimed at maximizing the value derived from resources while minimizing their consumption. In the Green Economy, this is achieved by adopting innovative strategies that reduce resource depletion. This principle is closely aligned with the concept of a circular economy, where materials are continuously recycled, reused, or repurposed to extend their use and decrease waste. An essential part of this approach is embracing renewable energy sources, which helps societies move away from finite and harmful energy sources like fossil fuels, thereby reducing their ecological footprint, enhancing energy security, and building resilience against global challenges.

METHODOLOGY

The study design is a combination of quantitative and qualitative approaches. Indeed, bibliometric, systematic, semantics, and content analysis are combined because they are complementary methods (Tahiri Jouti, 2019). Firstly, the bibliometric analysis allows for examining published data, measuring text and information such as authorship, affiliation, citations, and keywords, and illustrates linkages between articles related to a specific research topic. This method can also be applied to evaluate, describe, and monitor the state of a specific field over time, conducting a meta-analysis to identify the critical elements and underlying theoretical frameworks of a research area. Meanwhile, the systematic analysis provides a structured examination of existing literature to answer a specific research question, synthesising the best evidence and widely disseminating these results. Finally, the content analysis

facilitates a deep understanding of the study constructs and their interaction, while the semantic analysis helps define definitions and construct narrative scenarios.

RESEARCH RESULT

The present study is conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines to ensure robustness, consistency, and transparency. This structured approach necessitates a precise definition and description of search strategies, screening processes, and criterion selection, which inspired the research method arranged in the five steps: i) Research problem identification; ii) Search strategies; iii) Sampling procedures; iv) Data extraction, analysis, and synthesis; and v) Results reporting.

Descriptive Summary of the Selected Studies

Table 1. Descriptive Summary of the Selected Studies

Author(s)	Year	Title	Journal/Source	Key Findings
Dominique Benzaken, Jean Paul Adam, John Virdin, Michelle Voyer	2024	From concept to practice: financing sustainable blue economy in Small Island Developing States, lessons learnt from the Seychelles experience	Marine Policy	The study investigates financing strategies for the sustainable blue economy in Small Islands Developing States (SIDS) using Seychelles as a case study. It identifies key factors for success including global financial support, strong local governance, and innovative financing mechanisms like blue bonds and debt swaps. Challenges include high costs of borrowing, lack of sufficient private sector investment, and the need for an enabling environment to attract substantial

				finance. The paper calls for a strategic approach to leverage blue economy opportunities and stresses the importance of equitable financial frameworks.
Wei Liu, Jian Zhang, Ming Ji, Yujia Luo	2024	Investigating the link between green finance, environmental orientation, and carbon neutrality: A panel study of the metal extraction sector	Resources Policy	The study investigates how green finance and environmental orientation influence carbon neutrality in the metal extraction industry, highlighting the positive effects of green finance and environmental orientation on achieving carbon neutrality in the metal sector in China and India.
Sanjeev Yadav, Ashutosh Samadhiya, Anil Kumar, Sunil Luthra, Krishan Kumar Pandey	2024	Nexus between fintech, green finance and natural resources management: Transition of BRICS nation industries from resource curse to resource blessed sustainable economies	Resources Policy	The study explores how fintech and green finance can help BRICS nations transition from a resource curse to a resource blessed sustainable economy. It proposes that integrating fintech in green finance initiatives can enhance resource management and economic

				sustainability. The research highlights the need for updated green finance policies to facilitate this transition, driven by technological innovations and robust financial frameworks.
Suriani Suriani, Raja Masbar, Maulidar Agustina, Athalla Daffa Khairul	2024	Do Global Green Sukuk affect on Climate Change? Evidence in Issuing Countries	International Journal of Energy Economics and Policy	The study finds that global green Sukuk can significantly reduce the adverse effects of climate change in issuing countries both in the short and long term. Economic growth, however, contributes to increased carbon emissions in the long term, while trade openness has no significant effect on climate change.
Mabruk Billah, Md Rafayet Alam, Mohammad Enamul Hoque	2024	Global uncertainty and the spillover of tail risk between green and Islamic markets: A time-frequency domain approach with portfolio implications	International Review of Economics and Finance	he study investigates the spillover of tail risk between green and Islamic financial markets under different global uncertainties using advanced econometric models. It finds significant spillover effects particularly during periods of high global uncertainty like

				the COVID-19 pandemic and the Russia-Ukraine war. The study suggests that Islamic bonds show potential as a hedging tool against the volatility in green markets, offering practical insights for portfolio management in volatile economic times.
Muhammad Abubakr Naeem et al.	2023	Religion vs ethics: hedge and safe haven properties of Sukuk and green bonds for stock markets pre- and during COVID-19	International Journal of Islamic and Middle Eastern Finance and Management	The study examines the hedge and safe-haven properties of Sukuk and green bonds before and during the COVID-19 pandemic. It finds that green bonds show significant safe-haven properties for multiple international stocks during economic downturns, providing considerable diversification benefits, while Sukuk exhibits varying hedge and safe-haven properties.
Mabruk Billah, Amine Ben Amar, Faruk Balli	2023	The extreme return connectedness between Sukuk and green bonds and their	Pacific-Basin Finance Journal	The study investigates the return connectedness between Sukuk and green

		determinants and consequences for investors		bonds using a quantile-based connectivity methodology. It finds that return connectedness is higher in the extremes (left and right tails) than in the median, suggesting that mean-based measures are not adequate. The research also indicates that macroeconomic conditions significantly
Md. Hasanur Rahman, Junaid Rahman, Tipon Tanchangya, Miguel Angel Esquivias	2023	Green banking initiatives and sustainability: A comparative analysis between Bangladesh and India	Research in Globalization	The study analyzes green banking initiatives in Bangladesh and India, focusing on their role in promoting sustainable development and meeting SDGs, particularly SDG 7 (clean energy) and SDG 13 (climate action). The findings suggest that while both countries are advancing in green banking, significant differences in the approaches and extent of integration with national policies exist. The study emphasizes the importance of continued governmental support and innovative

banking practices to enhance the sustainability of financial systems.

Wahyu Jatmiko et al.	2023	Sukuk development and income inequality	Journal of International Financial Markets, Institutions & Money	The study examines the link between the development of Sukuk (Islamic bonds) and income inequality across 22 countries from 1995 to 2019. It finds that Sukuk issuance is associated with increased income disparity due to Sukuk design ignoring credit market frictions, suggesting that reinforcing property rights could improve Sukuk's socioeconomic role.
Mabruk Billah, Ahmed H. Elsayed, Sinda Hadhri	2023	Asymmetric relationship between green bonds and Sukuk markets: The role of global risk factors	Journal of International Financial Markets, Institutions & Money	The study explores the asymmetric connectedness and spillover effects between green bonds and Sukuk in relation to global risk factors. It finds persistent features in the connectedness between certain Sukuk markets under varying conditions and suggests that Sukuk can effectively

hedge the risks associated with green bonds and global factors.

Mahdi Ghaemi Asl, Muhammad Mahdi Rashidi, Aviral Kumar Tiwari, Chi-Chuan Lee, David Roubaud	2023	Green bond vs. Islamic bond: Which one is more environmentally friendly?	Journal of Environmental Management	The study investigates the relationship between green bonds and Islamic bonds (Sukuk) and their impact on clean energy and technology indices. It finds that certain ratings of Sukuk and green bonds have significant long-term and frequency-dependent effects on clean energy sectors, highlighting their potential in promoting environmentally friendly investments.
Burak Pirgaip, Özgür Arslan-Ayaydin, Mehmet Baha Karan	2021	Do Sukuk provide diversification benefits to conventional bond investors? Evidence from Turkey	Global Finance Journal	The study explores the diversification benefits of Sukuk in bond portfolios, finding that mixed portfolios of Sukuk and conventional bonds yield a "lower risk-higher return" profile, especially when the economy worsens.
Khamis Hamed Al-Yahyaee, Walid Mensi, Mobeen Ur Rehman, Xuan	2020	Do Islamic stocks outperform conventional stock sectors	Pacific-Basin Finance Journal	The study compares the performance of Islamic and

Vinh Vo, Sang Hoon Kang	during normal and crisis periods? Extreme co-movements and portfolio management analysis	conventional Dow Jones stock market indices during pre- crisis, crisis, and post-crisis periods. It finds that Islamic equity returns generally dominate conventional returns during the crisis periods (GFC and ESDC) and post-crisis, with significant portfolio risk management implications.
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DISCUSSION

Despite the significant growth of the sukuk market, it faces several challenges that could hinder its further expansion. Jobst et al. (2008) highlight the difficulty in finding underlying assets that meet both Islamic screening criteria and the risk/return expectations of potential investors. Additionally, conventional risk management tools do not apply to sukuk for various reasons, and Islamic risk management tools are still under development (Alshater et al., 2022). The approval of sukuk by Sharia scholars can be inconsistent due to varying interpretations of Islamic jurisprudence across different Muslim regions. There is evidence suggesting that sukuk may resemble conventional bonds, and the high costs associated with Sharia compliance, borne by the issuer, may lead to the approval of less Sharia-compliant sukuk (Suriani et al., 2024). However, sukuk approved by reputable Sharia scholars can potentially reduce the issuer's cost of capital (Sabbar et al., 2023). While AAOIFI has set guidelines for sukuk issuance, these need to be practically implemented across all jurisdictions.

Taxation poses another significant challenge, especially when introducing sukuk to non-Muslim countries. Unlike conventional bonds, which benefit from tax shields on interest payments, sukuk have a unique structure that involves the creation of a Special Purpose Vehicle (SPV). Sukuk holders are the legal and beneficial owners of the underlying assets purchased through the SPV. If the SPV is treated as a taxable entity, it may be subject to corporate tax, and the income from the sukuk might be taxed again from the investor's perspective, leading to double taxation (Radzi & Lewis, 2015).

Companies typically turn to the sukuk market under certain conditions: when they face low financial constraints and their stock prices are undervalued (Rozman & Azmi, 2022), when the funding required is too large for traditional banks to handle (Grassa & Miniaoui, 2018), and when there is asymmetric information present (Fahad & Khan, 2022). Furthermore, opting for sukuk over conventional debt can be understood by considering agency costs. Sukuk tend to

have lower agency costs for two main reasons. Firstly, the structure of sukuk involves the securitization of a real and recognizable asset that complies with Islamic law, unlike conventional bonds which are primarily debt obligations. Secondly, the contractual design of sukuk prevents managerial misappropriation as the cash flow and the management of the underlying asset are entangled through a Special Purpose Vehicle (SPV). As discussed earlier, sukuk can be either asset-backed or asset-based, and the choice between these types can also contribute to reducing agency costs (Ghaemi Asl et al., 2023)

CONCLUSIONS AND RECOMMENDATIONS

The sukuk market has shown remarkable growth, providing financing solutions that comply with Islamic law and appealing to both traditional and Islamic investors. The integration of ethical and financial considerations makes sukuk an attractive tool for fostering economic growth, particularly in Muslim-majority countries. However, challenges such as inconsistent Sharia compliance, regulatory hurdles, and taxation issues hinder its broader acceptance and efficiency. The unique structure of sukuk, which ties investments to real assets and ensures compliance with Islamic principles, also complicates their comparison and competition with conventional financial instruments.

1. **Standardization of Sharia Compliance:** Develop uniform guidelines for Sharia compliance across different regions to reduce inconsistencies and enhance market confidence. Collaboration among Islamic scholars and financial experts can help formulate standards that uphold Islamic principles while promoting market growth.
2. **Enhanced Risk Management Tools:** Encourage the development of risk management tools specific to Islamic finance. Training programs for financial professionals in this sector can focus on the unique aspects of sukuk structuring and risk assessment.
3. **Regulatory Improvements:** Governments and international regulatory bodies should work together to create more conducive environments for sukuk issuance. This includes simplifying the taxation process for sukuk to avoid double taxation, thereby making them more competitive with conventional bonds.
4. **Public Awareness and Education:** Increase public and investor awareness about the benefits and structures of sukuk through educational campaigns. Improved understanding of sukuk's ethical dimensions and financial benefits will likely attract a broader investor base.
5. **Research and Development:** Support academic and market research on sukuk to foster innovation and address current challenges. Continuous research can provide insights into effective practices and new opportunities within the sukuk market.
6. **Expand Sukuk Applications:** Explore the use of sukuk in new areas such as sustainable and green finance. Given the alignment of Islamic finance principles with sustainability goals, sukuk can be a key instrument in funding renewable energy projects and other environmentally friendly initiatives.

ADVANCED RESEARCH

To further enhance the understanding and efficiency of the sukuk market, several areas warrant in-depth study. Firstly, comparative analyses between sukuk and conventional financial instruments across different economic conditions can shed light on their relative stability and performance. Additionally, the variability in Sharia compliance across different regions calls for an examination to understand its impact on global market dynamics and investor confidence. There is also a crucial need to explore innovative sukuk structures that can accommodate a broader range of assets and investment strategies, potentially including hybrid models that integrate Islamic and conventional finance principles. Addressing the regulatory, legal, and taxation challenges, particularly in non-Muslim jurisdictions, will help identify and mitigate barriers to market expansion. Furthermore, the potential of sukuk in financing sustainable and green projects should be explored to align with global environmental goals. Finally, the integration of new technologies such as blockchain and smart contracts could revolutionize the sukuk market by enhancing transparency, reducing transaction costs, and broadening access to Islamic finance. These studies are essential to driving the sukuk market forward, making it a more robust and inclusive financial option on the global stage.

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