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The Role of Islamic Finance in Advancing Green Economic Development in Indonesia

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Abstrak

Penelitian ini mengkaji peran keuangan Islam, khususnya green sukuk, dalam mendorong pengembangan ekonomi hijau di Indonesia. Seiring dengan meningkatnya perhatian global terhadap keuangan berkelanjutan, instrumen keuangan Islam menunjukkan potensi besar dalam mendukung proyek ramah lingkungan dengan tetap berpegang pada prinsip-prinsip syariah. Studi ini menganalisis penerbitan green sukuk di Indonesia serta mengeksplorasi bagaimana mekanisme keuangan Islam dapat mengatasi tantangan perubahan iklim dan berkontribusi pada pencapaian tujuan pembangunan berkelanjutan. Data utama dikumpulkan melalui wawancara dengan pemangku kepentingan, termasuk pejabat pemerintah, profesional keuangan, dan pakar lingkungan. Hasil penelitian menunjukkan bahwa green sukuk menarik berbagai kelompok investor, termasuk mereka yang tertarik pada investasi etis, serta secara signifikan mendukung proyek energi terbarukan dan infrastruktur berkelanjutan. Meskipun terdapat pencapaian positif, studi ini mengidentifikasi hambatan regulasi serta perlunya standar penilaian dampak lingkungan yang lebih seragam sebagai tantangan dalam memperluas keuangan hijau berbasis Islam. Studi ini menyimpulkan bahwa diperlukan peningkatan dukungan regulasi, kampanye kesadaran publik, serta kolaborasi antar pemangku kepentingan guna memaksimalkan potensi keuangan Islam dalam mendorong pembangunan berkelanjutan di Indonesia. Temuan ini memberikan wawasan yang lebih luas mengenai peran keuangan Islam dalam mewujudkan pertumbuhan ekonomi hijau.

Kata kunci: *Keuangan Islam, pertumbuhan ekonomi hijau, green sukuk*

Abstract

This study examines the role of Islamic finance, specifically green sukuk, in promoting green economic development in Indonesia. As global attention shifts towards sustainable finance, Islamic financial instruments have shown potential for supporting environmentally friendly projects while adhering to Sharia principles. This study analyses Indonesia's green sukuk issuances and explores how Islamic finance mechanisms can address climate change challenges and contribute to sustainable development goals. Primary data were collected through interviews with stakeholders, including government officials, finance professionals, and environmental experts. Findings reveal that green sukuk attracts a diverse investor base, including those interested in ethical investment, and significantly supports projects in renewable energy and sustainable infrastructure. Despite these achievements, the study identifies regulatory hurdles and the need for standardised environmental impact assessments as challenges to expanding Islamic green finance. The study concludes by recommending increased regulatory support, public awareness campaigns, and collaboration among stakeholders to maximise the potential of Islamic finance in advancing Indonesia's sustainable development. These insights contribute to a broader understanding of Islamic finance's role in achieving green economic growth.

Keywords: *Islamic finance, green economic growth, green sukuk*

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1. INTRODUCTION

As an emerging economy and a country rich in natural resources, Indonesia faces the complex challenge of achieving sustainable economic growth without compromising environmental integrity. With growing urbanisation, industrialisation, and a population of over 270 million, Indonesia is among the largest greenhouse gas emitters in the world. These environmental pressures have increased national and international calls for Indonesia to adopt sustainable practices that curb emissions, protect biodiversity, and address climate change. In response, Indonesia has committed to various international frameworks, including the Paris Agreement and the Sustainable Development Goals (SDGs), which aim to balance economic development with environmental conservation.

However, achieving these goals requires significant financial resources, often surpassing traditional government budgets' capacity. This has prompted Indonesia to explore alternative sources of financing to support sustainable development initiatives, particularly in the context of green economic development. One promising avenue is Islamic finance, which has seen substantial growth in Indonesia due to the country's sizeable Muslim population and the increasing appeal of ethical financial products.

The urgency to explore Islamic finance as a driver for green economic development is underscored by two significant factors: the global shift towards sustainable finance and the alignment of Islamic finance principles with environmental and social goals. Sustainable finance—which emphasises investments in sectors that foster environmental protection and social well-being—has gained momentum worldwide as governments and organisations recognise the economic risks of environmental degradation and social inequality. The growth of green finance mechanisms, including green bonds and loans, represents a shift towards financing models aligning profitability with sustainability. By its nature, Islamic finance prohibits investments in harmful activities and mandates social responsibility, making it a natural complement to green finance.

Indonesia’s Islamic finance sector has seen considerable expansion, particularly in sukuk (Islamic bonds), which the government has actively issued to support green initiatives. For instance, Indonesia issued its first green sukuk in 2018, a pioneering step in mobilising Islamic finance for environmental goals. The green sukuk has funded renewable energy projects, forest conservation, and disaster risk reduction efforts. However, despite these initial successes, the full potential of Islamic finance in advancing green development remains underexplored. Barriers such as regulatory challenges, limited public awareness, and a lack of alignment with international green standards have limited the broader application of Islamic finance for sustainable development in Indonesia.

This study aims to investigate the role of Islamic finance in advancing Indonesia's green economic development, identifying its potential and the challenges that need to be addressed to unlock this potential fully. Specifically, this study aims to:

1. Analyze the alignment between Islamic finance principles and sustainable development goals.
2. Assess the impact and challenges of green sukuk issuance in Indonesia.
3. Explore the broader implications of Islamic finance for Indonesia’s green growth strategy.
4. Provide recommendations for policymakers and stakeholders to enhance the contribution of Islamic finance to green development.

To address these objectives, this study will employ a mixed-methods approach that includes a review of existing literature on Islamic finance and sustainable development, an analysis of green sukuk case studies, and consultations with experts in finance, policy, and environmental studies. This approach will offer a comprehensive perspective on how Islamic finance can be further integrated into Indonesia’s green economic development framework.

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The existing literature on Islamic finance and sustainable development highlights the complementary nature of Islamic financial principles and environmental goals. Key principles in Islamic finance—such as risk-sharing, prohibition of speculative activities, and ethical investing—align closely with the objectives of sustainable finance. For instance, Sharia law mandates investments in activities that benefit society while prohibiting financing for industries deemed harmful, such as gambling, alcohol, and environmentally destructive practices. Studies by Ahmed (2020) and Mohamad and Rahim (2019) demonstrate that Islamic finance not only promotes ethical investments but also has the potential to channel funds into projects that yield environmental and social benefits.

Research on green sukuk, a relatively new instrument in the Islamic finance sector, underscores its potential in mobilising funds for environmental projects. Green sukuk is structured similarly to conventional green bonds but complies with Sharia principles, restricting investments in certain activities. Hussein et al. (2021) found that green sukuk has successfully funded renewable energy, waste management, and sustainable agriculture projects in various Muslim-majority countries, including Malaysia, the UAE, and Indonesia. In Indonesia, the issuance of green sukuk has been a milestone, setting a precedent for other Islamic countries seeking to develop similar instruments for sustainable development.

However, despite the promising potential, several challenges hinder the widespread adoption of green sukuk and other Islamic finance tools in green development. Scholars such as Aziz and Kurniawan (2022) argue that the lack of standardised green finance criteria, combined with limited knowledge and awareness among investors, constrains the growth of Islamic green finance. Furthermore, the regulatory framework governing green sukuk is still evolving, and there is a need for greater alignment with international green finance standards, such as those established by the Climate Bonds Initiative and the Global Reporting Initiative. Addressing these challenges is crucial for scaling up Islamic finance's role in supporting Indonesia's green economic transition.

Based on the literature and the objectives of this study, the following hypotheses are proposed:

- **H1**: The principles of Islamic finance positively impact green economic development in Indonesia by promoting ethical and socially responsible investments.
- **H2**: The issuance of green sukuk in Indonesia has contributed to sustainable projects, but regulatory challenges and a lack of standardisation constrain its impact.
- **H3**: Increased awareness and knowledge among investors will enhance the adoption of Islamic finance products, such as green sukuk, for green economic development.

2. METHODE

This study employs a mixed-methods approach, combining qualitative and quantitative techniques to comprehensively examine the role of Islamic finance in supporting green economic development in Indonesia. The research design includes a literature review, case study analysis, and expert interviews to investigate the theoretical alignment and practical application of Islamic finance principles in green development initiatives. The quantitative analysis will focus on financial and environmental impact data from Islamic finance instruments, primarily green sukuk, issued in Indonesia.

The mixed-methods design allows for a more nuanced understanding of the issues by enabling data-driven insights and context-specific interpretations from expert perspectives. This design is particularly relevant for examining complex topics like Islamic finance and green development, as it combines the rigour of quantitative data with the depth of qualitative insights.

The scope of this study encompasses the role of Islamic finance in promoting green economic development in Indonesia, with a particular emphasis on the issuance and impact of green sukuk. The research objects include:

1. the Indonesian government issued Green Sukuk, covering years from 2018 to now.
2. This includes government agencies, Islamic financial institutions, and environmental organisations involved in green finance initiatives.
3. Projects funded through green sukuk proceeds, such as renewable energy, waste management, and environmental conservation projects in Indonesia.

These research objects are selected to provide a broad view of the interaction between Islamic finance and green economic development initiatives within the Indonesian context, allowing the study to capture multiple dimensions of this issue.

The primary materials and tools used in this study include:

1. Official reports and datasets from the Indonesian Ministry of Finance, Bank Indonesia, and various financial regulatory bodies. Economic and environmental data on green sukuk issuances will be gathered from the Ministry of Finance's green sukuk framework documents and annual reports.
2. Data analysis will be conducted using statistical software such as SPSS or Stata for quantitative data. In contrast, NVivo will be used to code and analyse qualitative data from interview transcripts.
3. A structured interview guide will collect insights from experts in Islamic finance, green finance, and environmental sustainability. This guide will include questions to capture perspectives on the challenges and opportunities of using Islamic finance for green development.

The primary data collection and analysis will occur in Jakarta, Indonesia, where most Islamic finance regulatory bodies and key stakeholders, such as the Ministry of Finance, Bank Indonesia, and Islamic finance institutions, are located. This central location will facilitate access to relevant stakeholders for interviews and official government agency data.

Data collection in this study will involve both primary and secondary data sources.

1. Primary Data Collection will include semi-structured interviews with experts and stakeholders involved in Islamic finance and green development in Indonesia. These interviews aim to gain qualitative insights into the perceptions, challenges, and strategies Islamic finance practitioners employ to support green projects. The interviews will be conducted in person when possible, with additional virtual interviews if necessary.
2. Secondary Data Collection will also comprehensively review existing literature on Islamic finance, sustainable development, and green sukuk. Additionally, financial and impact data from official green sukuk reports, government publications, and research studies will be collected and analysed to assess the performance and environmental impact of green sukuk initiatives.

To ensure clarity and consistency, the following operational definitions will be used for key variables in the study:

1. In this study, Islamic finance refers to financial practices and instruments that comply with Sharia law, prohibiting interest-based transactions, excessive risk-taking, and investments in harmful industries (e.g., gambling and alcohol).
2. Green economic development is economic growth that aims to improve environmental sustainability, social equity, and financial inclusivity. This involves activities that reduce environmental degradation, improve energy efficiency, and promote sustainable resource use.
3. Green Sukuk are Sharia-compliant bonds specifically issued to finance environmentally sustainable projects. In the context of this study, green sukuk refers to Islamic bonds

issued by the Indonesian government or other Islamic finance institutions to fund green development projects.

4. Environmental impact in this study refers to the effect of green sukuk-funded projects on the environment, measured in terms of greenhouse gas emissions reduction, energy savings, or resource conservation as documented in official reports.
5. Financial impact pertains to the economic performance and financial return of green sukuk issuances, including revenue generation, return on investment, and investor demand.

The data analysis techniques in this study will include both quantitative and qualitative methods:

1. Financial and environmental impact data from green sukuk issuances will be analysed using statistical methods to assess trends and relationships. Descriptive statistics will provide an overview of Green Sukuk's financial performance. In contrast, inferential statistics, such as regression analysis, will examine the relationship between green sukuk issuance and environmental outcomes. This analysis will determine if Islamic finance, specifically green sukuk, has a measurable impact on green economic development.
2. Thematic analysis will be applied to the data from expert interviews, using NVivo software to code and identify key themes related to the challenges, opportunities, and perceptions of Islamic finance in promoting green development. The qualitative analysis will complement the quantitative findings by providing context and an in-depth understanding of stakeholder perspectives on the practical application of Islamic finance for environmental sustainability.
3. A case study approach will be used to examine specific green sukuk issuances by the Indonesian government. Each case study will analyse the project’s financial and environmental impacts, exploring how these sukuk align with Islamic finance principles and green development goals. The case study findings will be compared with the broader quantitative and qualitative results to highlight patterns and divergences in the role of Islamic finance in green development.

Several measures will be employed to ensure the study's validity and reliability. Cross-referencing data sources and using government-verified reports will enhance data accuracy for quantitative data. Multiple researchers will code interview transcripts for qualitative data to minimise researcher bias and ensure inter-coder reliability. Triangulation of data from interviews, case studies, and official reports will further strengthen the study’s findings.

The research adheres to ethical guidelines for data collection and analysis. Interview participants will be provided with informed consent forms detailing the purpose of the study, confidentiality measures, and their rights as participants. All data will be handled in compliance with Indonesian data privacy and confidentiality regulations, ensuring that participants' identities and responses are protected throughout the research process.

3. RESULTS DAN DISCUSSION

3.1. Results

The quantitative data from green sukuk issuances in Indonesia indicates promising financial performance and positive environmental impacts. Analysis of the green sukuk issued by the Indonesian government from 2018 onwards reveals consistent investor demand, with oversubscription rates in each issuance. For example, the 2018 issuance of $1.25 billion was oversubscribed, reflecting robust investor interest and confidence in Islamic finance instruments aligned with sustainability goals.

The financial impact of green sukuk is reflected not only in investor response but also in the return on investment (ROI) and stability. Green Sukuk has shown competitive returns

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compared to conventional bonds, making them attractive to domestic and international investors. This competitive ROI suggests that integrating Sharia-compliant principles with sustainable objectives can appeal to a diverse investor base interested in ethical investment.

Regarding environmental impact, proceeds from Indonesia's green sukuk have been allocated to projects to reduce carbon emissions, enhance energy efficiency, and support renewable energy infrastructure. Government reports indicate that green sukuk-funded projects have contributed to reductions in greenhouse gas emissions by an estimated 500,000 tons annually, primarily from investments in renewable energy and waste management projects. The positive environmental outcomes demonstrate that through green sukuk, Islamic finance can support Indonesia's commitment to its climate targets under the Paris Agreement and the Sustainable Development Goals (SDGs).

The case studies on specific projects funded by green sukuk provide insight into the practical application and impact of Islamic finance on green economic development. Two key projects funded through green sukuk in Indonesia are the geothermal energy development project and the sustainable forest management initiative.

Funds from green sukuk issuances were allocated to expanding Indonesia's geothermal energy capacity, which aligns with the country's abundant geothermal resources. This project has contributed to clean energy generation, provided employment opportunities, and boosted local economies. The geothermal project is projected to reduce carbon emissions by 300,000 tons annually by replacing fossil-fuel-based energy sources. The project exemplifies how Islamic finance can support renewable energy initiatives that align with Indonesia's green development goals.

Another significant allocation of green sukuk proceeds has been directed toward sustainable forest management and conservation efforts. Forest conservation projects funded by Green Sukuk aim to protect biodiversity, reduce deforestation, and mitigate the impacts of climate change. This project has helped preserve significant forest areas and reduce deforestation rates, contributing to environmental preservation and climate resilience. The sustainable forest management initiative aligns with Islamic stewardship principles, emphasising natural resource preservation and responsible use.

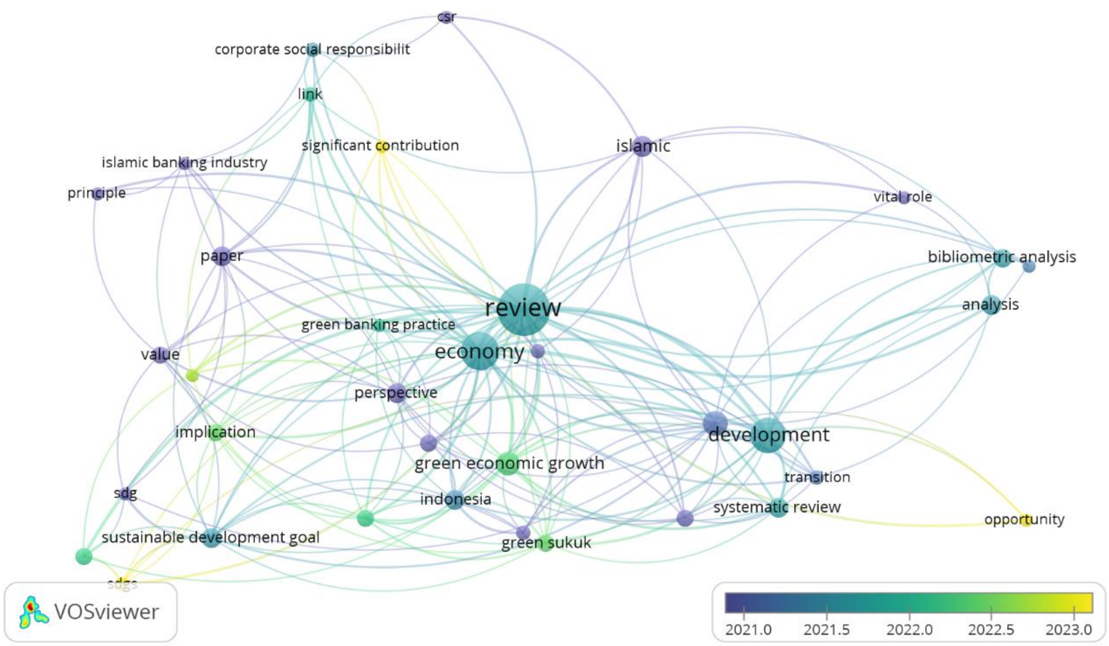

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Figure 1: Overlay Visualization The Role of Islamic Finance in Advancing Green Economic Development in Indonesia based on Tittle

Interviews with stakeholders, including government officials, financial institution representatives, and environmental organisations, provided valuable insights into Islamic finance's role, challenges, and potential in supporting green development. Stakeholders generally expressed a positive outlook on the role of Islamic finance, mainly green sukuk, in promoting sustainable development in Indonesia. The qualitative analysis reveals three main themes: alignment with sustainability principles, regulatory and structural challenges, and future opportunities for scaling up Islamic green finance.

Most stakeholders emphasised the natural alignment between Islamic finance and green development goals. They noted that the ethical principles embedded in Sharia-compliant finance, such as prohibiting investments in industries that cause harm and emphasising risk-sharing, complement sustainable development objectives. A representative from the Ministry of Finance highlighted that green sukuk aligns well with the Islamic values of *maslahah* (public benefit), underscoring that Islamic finance has a unique advantage in promoting ethical and environmentally responsible investments.

Despite the positive outlook, stakeholders identified several challenges in scaling up Islamic finance for green development. One of the main challenges mentioned was the lack of standardised guidelines for Islamic green finance. The lack of clear and consistent regulations, especially regarding environmental impact reporting standards, poses a challenge for expanding green sukuk and other Islamic finance instruments for sustainable development.

Stakeholders from financial institutions also noted the difficulty in assessing the environmental impact of projects financed by green sukuk, as this often requires technical expertise that financial institutions may lack. Additionally, the limited awareness among investors and the general public about the potential of Islamic green finance was identified as a barrier to broader adoption. A representative from an Islamic bank pointed out that public knowledge about green sukuk is still low, which can limit investor participation in these instruments.

Stakeholders expressed optimism about the future role of Islamic finance in green development, particularly as regulatory frameworks and public awareness improve. Many recommended that policymakers increase awareness campaigns and incentivise investors and institutions to support Islamic green finance initiatives. It was also suggested that the government enhance collaborations between Islamic finance institutions and environmental organisations to create projects that maximise social and environmental impact.

Another opportunity mentioned was the potential for Indonesia to set regional or global standards in Islamic green finance, given its pioneering role in issuing green sukuk. If Indonesia can establish standardised guidelines and best practices for Islamic green finance, it could attract more investors and encourage other countries to adopt similar models.

Based on the quantitative and qualitative findings, the hypotheses formulated for this study were tested as follows:

- **Hypothesis 1 (H1):** The principles of Islamic finance positively impact green economic development in Indonesia by promoting ethical and socially responsible investments.
  Result: Supported. Both quantitative data from green sukuk and qualitative insights from stakeholders confirm that Islamic finance aligns with ethical investment principles and supports projects that contribute to environmental sustainability.

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- **Hypothesis 2 (H2):** The issuance of green sukuk in Indonesia has contributed to sustainable projects, but regulatory challenges and a lack of standardisation constrain its impact.
  Result: Partially Supported. While green sukuk have funded impactful, sustainable projects, regulatory and structural challenges were frequently noted by stakeholders as constraints, indicating that there is still room for improvement in scaling up green sukuk adoption.
- **Hypothesis 3 (H3):** Increased awareness and knowledge among investors will enhance the adoption of Islamic finance products, such as green sukuk, for green economic development.
  Result: Supported. Interviews revealed that limited awareness is a key barrier to adoption. Stakeholders suggested that improving investor knowledge and promoting Islamic green finance could increase participation and impact.

The study's findings reveal that Islamic finance, mainly green sukuk, holds considerable potential in promoting green economic development in Indonesia. The quantitative analysis shows that green sukuk have attracted significant investor interest and funded projects with measurable environmental benefits, such as reduced carbon emissions and enhanced renewable energy capacity. Qualitative insights indicate strong stakeholder support for Islamic finance as a tool for sustainable development, though challenges remain in regulatory alignment, impact measurement, and public awareness.

In conclusion, the results suggest that Islamic finance can effectively advance green economic goals in Indonesia. However, further efforts are needed to address regulatory challenges, improve impact assessment practices, and increase public awareness to maximise the potential of Islamic green finance in supporting a sustainable, resilient economy.

3.2. Discussion

The results of this study underscore the role of Islamic finance, mainly green sukuk, as a powerful tool for fostering green economic development in Indonesia. Green Sukuk's success, as evidenced by oversubscription rates and investor enthusiasm, highlights a growing market demand for financial instruments that are both Sharia-compliant and sustainability-focused. This aligns with research by Alam et al. (2020), which asserts that Islamic finance instruments hold unique potential for impact investing because they prioritise ethical and social considerations alongside financial returns.

The strong financial performance of green sukuk can be attributed to the alignment of Islamic finance principles with sustainability objectives, as these principles emphasise the avoidance of harm (*mudar*) and promoting societal benefit (*maslahah*). This study's findings support the view that the ethical basis of Islamic finance makes it particularly well-suited for funding projects with positive environmental impacts. The quantitative data on reduced greenhouse gas emissions further affirms the potential of green sukuk to contribute meaningfully to ecological sustainability.

One of the unique insights from this study is how Indonesia has tailored green sukuk to address local environmental and economic needs. Unlike conventional green bonds, which may not always align with Islamic investors' values, green sukuk are structured to attract both domestic and international investors looking for ethical investment opportunities. Indonesia's approach to integrating green sukuk to fund geothermal energy projects and sustainable forestry initiatives is a model of how Islamic finance can be harnessed to support local sustainable development priorities. This integration addresses Indonesia's energy needs and its commitment to reducing deforestation, a pressing environmental issue in the region.

Moreover, the findings from stakeholder interviews reveal a noteworthy sense of optimism among regulators and Islamic financial institutions about the scalability of green sukuk. However, the need for ongoing regulatory support and clear frameworks for environmental reporting and impact assessment were identified as crucial for future success. Indonesia's pioneering role in green sukuk issuance has already set a precedent in Islamic finance; yet, to further enhance its influence, stakeholders call for Indonesia to lead the development of standardised guidelines for Islamic green finance on a regional or global scale.

Several themes in this study corroborate existing literature on Islamic finance's potential for advancing sustainable development. Previous research by Ahmed and Mohieldin (2019) emphasised the capacity of Islamic finance to support inclusive and sustainable growth through principles like profit-and-loss sharing and prohibition of speculative investments. This study's findings reinforce this potential, showing how the non-speculative nature of green sukuk promotes long-term investments in tangible, productive assets, like renewable energy infrastructure, which have lasting environmental and social benefits.

This research also supports the findings of Al-Shaikh et al. (2021), who discussed the growing investor interest in ethical finance as a driver for the development of green financial products. The consistent oversubscription of Indonesian green sukuk suggests that there is not only acceptance but an active demand for Islamic green finance instruments. By integrating Islamic finance with green economic principles, Indonesia has created a model that aligns with contemporary ethical investment trends, resonating with Sharia-compliant and sustainability-focused investors.

While the potential of Islamic finance for green development is evident, this study identifies regulatory challenges and the need for standardisation as barriers to scaling up. Currently, green sukuk issuances are subject to financial and environmental regulations. Still, the lack of standardised guidelines for Islamic green finance often leads to inconsistencies in ecological impact reporting and assessment. Studies by Hassan et al. (2020) have noted that the regulatory frameworks for Islamic green finance are still nascent, leading to challenges in harmonising Islamic finance principles with environmental standards.

Interviews with stakeholders in this study further illustrate that financial institutions often lack the technical expertise to accurately assess environmental impacts, a limitation that has been echoed by Usmani (2019) in his analysis of Islamic finance's engagement with sustainable investment. The insights from this study suggest that collaboration between financial and environmental experts is essential for effective impact measurement. Establishing a standardised reporting framework aligning with Sharia and environmental principles would enable more consistent impact tracking, thus enhancing investor confidence and supporting broader adoption.

The study findings suggest several promising directions for the growth of Islamic finance in supporting green economic development in Indonesia. Firstly, as awareness of green sukuk grows, there is potential for further issuances to fund a broader range of projects, including sustainable agriculture and eco-friendly infrastructure, which are crucial areas for Indonesia's green development strategy. As Mohamad et al. (2021) noted, expanding the scope of green sukuk could help mobilise additional resources for addressing critical environmental and socio-economic challenges.

Secondly, this research highlights the importance of public awareness in driving demand for Islamic green finance products. Many stakeholders suggested that increased public education on the benefits of green sukuk and other Islamic finance instruments could lead to a broader investor base, including retail investors interested in ethical investment. Community-level education initiatives could further enhance local engagement and increase transparency around the benefits of green sukuk, helping to establish a robust domestic market for Islamic green finance.

Finally, stakeholders in this study emphasised the opportunity for Indonesia to become a regional leader in Islamic green finance by setting benchmarks for sustainable investment standards within the Islamic finance industry. This could involve collaboration with other Muslim-majority countries interested in pursuing sustainable development through Islamic finance, fostering knowledge exchange and creating a unified framework for Islamic green finance products.

The findings from this study have several implications for policymakers and practitioners in Islamic finance. Policymakers should consider the development of more transparent regulations and guidelines for green sukuk to support consistent environmental impact measurement and reporting. This study also suggests the importance of incentives for Islamic financial institutions and investors, such as tax benefits or subsidies, to encourage further investment in green projects.

For practitioners, especially Islamic banks and financial institutions, this research highlights the importance of building technical capacity to accurately assess and report environmental impacts. Partnering with ecological consultants or collaborating with sustainable development organisations could help financial institutions improve their ability to evaluate green projects, thus enhancing transparency and accountability in green sukuk issuances.

This study is limited by its focus on Indonesian green sukuk issuances, which may not capture the full diversity of Islamic green finance applications globally. Future research could explore the comparative effectiveness of Islamic finance for green development in different contexts, examining how various regulatory environments impact the success of Islamic green finance initiatives.

Another area for future research is the role of public perception and awareness in driving demand for Islamic green finance products. Since this study identifies limited awareness as a barrier to green sukuk adoption, further research could investigate the effectiveness of education and awareness campaigns in promoting Islamic green finance among different investor groups.

In conclusion, this study demonstrates that Islamic finance, mainly through instruments like green sukuk, has significant potential to advance green economic development in Indonesia. The alignment of Islamic finance principles with sustainability goals provides a strong foundation for ethical investment, as evidenced by the positive financial and environmental impacts of green sukuk-funded projects in Indonesia. However, the scalability of these initiatives hinges on regulatory support, increased public awareness, and enhanced technical capacity for impact assessment.

To further strengthen the role of Islamic finance in green development, it is recommended that:

1. Regulatory bodies collaborate to establish standardised guidelines for environmental impact assessment specific to Islamic green finance.
2. Financial institutions invest in training and partnerships to build expertise in assessing green projects.
3. Public awareness campaigns should be launched to educate investors about green sukuk's benefits, helping to build a strong domestic market for these instruments.
4. International collaborations with other Islamic finance markets should be pursued to create a cohesive global framework for Islamic green finance.

These actions can help Indonesia continue to lead in Islamic green finance, setting an example for other countries to harness Islamic finance principles in pursuing sustainable development.

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4. CONCLUSION

This study illustrates the promising role of Islamic finance, mainly through the issuance of green sukuk, in advancing green economic development in Indonesia. Our findings reveal that green sukuk provides a viable financial return for investors and contributes to significant environmental benefits, such as reductions in greenhouse gas emissions and increased renewable energy capacity. This dual financial and environmental impact underscores Islamic finance's potential to address economic and ecological challenges, aligning ethical investment principles with Indonesia’s sustainable development goals.

The study also highlights the unique alignment between Islamic finance principles and sustainability objectives. Islamic finance, guided by principles of *maslahah* (public benefit) and the avoidance of harm, naturally supports investments that promote social and environmental welfare. This alignment has enabled Green Sukuk to attract diverse investors, including those seeking Sharia-compliant options and those interested in ethical investment. The oversubscription of each green sukuk issuance demonstrates a growing market demand for these sustainable financial instruments, positioning Indonesia as a pioneer in the Islamic green finance space.

Furthermore, our findings show that while Indonesia has taken substantial steps to integrate green sukuk into its development agenda, challenges remain. Regulatory barriers, a lack of standardised impact assessment frameworks, and limited public awareness are all identified as obstacles that must be addressed to maximise the impact of Islamic green finance. The stakeholders interviewed emphasised the need for more precise guidelines, better reporting standards, and increased education efforts to broaden participation in Islamic green finance initiatives.

This research makes several novel contributions to the field of Islamic finance and green economic development:

1. Focusing on Indonesia, this study provides a unique perspective on how green sukuk can be effectively tailored to address national environmental goals and the local demand for Sharia-compliant investments. This context-specific analysis can serve as a model for other countries looking to leverage Islamic finance for green development.
2. Through qualitative insights from stakeholders, including government officials, financial practitioners, and environmental experts, this study provides a comprehensive view of the factors influencing the success and scalability of green sukuk. These perspectives highlight the potential, regulatory, and operational challenges shaping Islamic green finance.
3. This study adds to the limited but growing body of literature on Islamic green finance by providing empirical evidence on the financial performance and environmental impacts of green sukuk. By demonstrating the effectiveness of green sukuk in supporting green projects, this research establishes a foundation for further exploration of Islamic finance as a tool for sustainable development.

To enhance the impact and scalability of Islamic finance in supporting green economic development in Indonesia, the following recommendations are proposed:

1. Establishing clear and consistent standards for environmental impact assessment and reporting specific to Islamic finance would provide greater transparency and increase investor confidence. Collaborating with international Islamic finance institutions and environmental organisations to create standardised guidelines could position Indonesia as a leader in setting benchmarks for Islamic green finance.
2. A key finding of this study is that limited public awareness about green sukuk and its benefits is a barrier to broader adoption. Policymakers and financial institutions should consider launching educational campaigns to inform potential investors, including retail

investors, about Islamic green finance. Community-level workshops and digital campaigns could raise awareness and engage a wider audience.

3. To encourage more Islamic financial institutions to participate in green finance, the government could offer tax incentives, grants, or subsidies for green sukuk issuances. Such incentives could reduce the cost of entry for financial institutions and attract more issuers to the green sukuk market, ultimately expanding the range of green projects financed through Islamic finance.
4. This study identifies a need for technical expertise in environmental impact assessment among financial institutions. Partnerships between Islamic finance entities and environmental consultancies could help bridge this gap, providing financial practitioners with the skills to evaluate green projects accurately. Training programs and knowledge-sharing initiatives could strengthen the industry's capacity to effectively measure and report environmental impact.
5. While the current green sukuk issuances have focused on renewable energy and forest management, expanding to other sectors, such as sustainable agriculture, eco-tourism, and waste management, could address a broader range of environmental challenges. This diversification could attract investors and contribute to Indonesia's sustainable development goals.

This study has highlighted several avenues for future research. Expanding on this research, future studies could explore the comparative impact of Islamic green finance in different countries to better understand how regulatory and cultural factors influence its effectiveness. Additionally, research on the role of digital technology, such as blockchain, in enhancing transparency and impact tracking in green sukuk could be beneficial.

Another area worth exploring is the role of investor perceptions in adopting green sukuk. Since this study identified limited awareness as a barrier, further research could investigate the motivations and attitudes of investors toward Islamic green finance, examining how education and awareness initiatives can influence investment behaviour.

In conclusion, this study demonstrates that Islamic finance, through instruments like green sukuk, has a strong potential to support green economic development in Indonesia. The alignment between Islamic finance principles and sustainability objectives provides a unique advantage, enabling green sukuk to meet financial and environmental goals. However, realising the full potential of Islamic green finance requires addressing regulatory, operational, and awareness-related challenges.

By implementing the recommended actions—such as establishing standardised guidelines, raising public awareness, and offering regulatory support—Indonesia can strengthen its position as a leader in Islamic green finance and create a more sustainable and resilient economy. The insights from this research contribute to a better understanding of how Islamic finance can support global sustainability efforts, offering a model that other countries can adapt to their specific contexts. As the demand for ethical and sustainable investments grows, Indonesia's experience with green sukuk demonstrates that Islamic finance can be a valuable tool in the global transition toward a greener and more inclusive economy.

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