

THE ROLE OF GREEN BONDS AND GREEN SUKUK IN SUSTAINABLE FINANCE: CHALLENGES, IMPACTS, AND STRATEGIC RECOMMENDATIONS

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Article history

Received date : 18-3-2025

Revised date : 19-3-2025

Accepted date : 6-4-2025

Published date : 25-4-2025

To cite this document:

Wahab, M. H., Mat Khairi, S. M., Hanafi, A. H. A., & Mohd Saufi, M. S. A. (2025). The role of green bonds and green sukuk in sustainable finance: Challenges, impacts, and strategic recommendations. *International Journal of Accounting, Finance and Business (IJAFB)*, 10 (60), 88 - 98

Abstract: *Green bonds and sukuk have emerged as vital financial instruments for funding environmentally sustainable projects, particularly in Malaysia, where Islamic finance plays a significant role. Despite their potential to drive economic growth, support environmental goals, and enhance financial market maturity, the adoption of green bonds and sukuk faces several challenges, including a lack of standardized regulations, greenwashing risks, high issuance costs, and limited awareness among investors. This study employs a systematic literature review to analyze the challenges, economic and environmental impacts, and recommendations associated with green bonds and sukuk. The findings highlight the positive contributions of green bonds to economic diversification, job creation, and sustainable infrastructure development while also identifying key barriers that hinder their effectiveness. To address these challenges, the study recommends establishing clear regulatory frameworks, enhancing transparency through improved reporting standards, providing financial incentives, and promoting investor awareness. Strengthening these areas will enhance the credibility and accessibility of green bonds, fostering a more robust sustainable finance ecosystem. The study contributes to the ongoing discourse on sustainable finance by providing insights into the evolving landscape of green bonds and sukuk, particularly within emerging markets.*

Keywords: *Green Bonds, Green Sukuk, Sustainable Finance, Greenwashing, Renewable Energy, Islamic Finance, Malaysia Sustainable Development.*

Introduction

Green bonds have emerged as a crucial financial instrument for mobilizing capital towards environmentally sustainable projects. Unlike conventional bonds, green bonds are specifically designed to fund initiatives that promote environmental sustainability, such as renewable energy, energy efficiency, sustainable waste management, and climate change adaptation (Manaktala, 2020). As an integral part of sustainable finance, green bonds enable investors to align their financial objectives with environmental stewardship, addressing climate change while fostering sustainable development (Rose, 2020; Fu et al., 2023).

In addition to green bonds, green sukuk offer a Sharia-compliant alternative to financing sustainable projects (Hakim, 2024). Green sukuk function similarly to green bonds but adhere to Islamic finance principles, thereby broadening the investor base and strengthening the impact of sustainable finance initiatives (Liu and Lai, 2021). This dual approach enhances the ability to attract diverse investors and encourages greater financial support for environmentally beneficial projects.

The growth of green bonds and green sukuk in Malaysia highlights the country's commitment to sustainable financing. A significant milestone in this effort was achieved in 2014 when the Securities Commission Malaysia introduced the Sustainable and Responsible Investment (SRI) Sukuk Framework, establishing a foundation for the issuance of green sukuk. This framework integrates Islamic finance principles with global sustainability objectives, paving the way for the issuance of Malaysia's first green sukuk in 2017. Tadau Energy Sdn Bhd raised USD 58 million to finance a large-scale solar power plant, marking Malaysia as a leader in sustainable finance within the ASEAN region (Tadau News, 2017).

The Malaysian green bond market has expanded significantly, with an increasing number of issuances supporting ecologically responsible projects. As of June 2020, Malaysia had issued 12 green sukuk, two social bonds, and three sustainable bonds, raising approximately USD 2.09 billion (Malaysian Sustainable Finance Initiative, 2024). These funds have primarily been allocated to green building construction and renewable energy projects such as hydropower and solar energy. Government incentives, such as tax deductions, and regulatory frameworks like the Climate Change and Principle-based Taxonomy have played a pivotal role in this expansion, reinforcing Malaysia's position as a leader in sustainable finance (Asian Development Bank, 2024).

Green bonds and green sukuk are essential tools in the global transition toward sustainable finance. Their growth in Malaysia demonstrates the potential of financial markets to drive environmental sustainability while providing investment opportunities that align with environmental, social, and governance (ESG) considerations. As Malaysia continues to lead in sustainable finance, its efforts serve as a model for other emerging markets seeking to integrate financial innovation with environmental responsibility.

Despite the rapid growth of the green bond market, challenges such as the risk of greenwashing—where funds may not be used as intended for environmental purposes—and the lack of standardized reporting and verification mechanisms remain key concerns (Alamgir & Cheng, 2023). Addressing these issues is essential to maintaining the credibility and effectiveness of green bonds in promoting sustainability.

Thus, this study aims to analyze the challenges associated with green bonds and green sukuk, assess their economic, environmental, and social impacts, and provide strategic recommendations to overcome these challenges. The research will explore key barriers such as regulatory inconsistencies, investor skepticism, and verification transparency while evaluating the benefits green bonds and sukuk bring to sustainable finance. Furthermore, the study will propose policy measures, incentive structures, and regulatory enhancements necessary to strengthen the green bond and sukuk ecosystem, ensuring their long-term viability and effectiveness in driving sustainable development.

Literature Review

Green Bonds and Sukuk are innovative financial instruments driving sustainable development. Green Bonds finance environmentally friendly projects, while Sukuk, compliant with Sharia law, represent asset-backed investments. Malaysia, a global leader in Islamic finance, has pioneered Green Sukuk, aligning with its sustainability goals under the Paris Agreement and Sustainable Development Goals (SDGs). This review synthesizes literature on their economic and investor impacts in Malaysia.

Green bonds, sukuk, and green sukuk are essential components of sustainable finance, each playing a unique role in mobilizing capital for environmentally responsible projects. Green bonds are debt instruments specifically designed to fund projects that promote environmental sustainability, such as renewable energy, energy efficiency, and climate adaptation initiatives (Climate Bonds Initiative, 2021). These financial instruments provide investors with a fixed return while ensuring that the proceeds are exclusively allocated to climate-friendly projects.

On the other hand, sukuk are Islamic financial certificates that comply with Shariah principles, offering investors partial ownership of an asset rather than conventional interest-bearing debt (Radzi & Muhamed, 2019). Unlike traditional bonds, sukuk transactions are structured around tangible assets and revenue-generating projects, ensuring that investments adhere to Islamic ethical and financial guidelines.

Green sukuk represents a fusion of green bonds and sukuk, integrating environmental sustainability with Shariah-compliant finance (Riaz et al., 2024). This innovative financial instrument addresses both ethical and environmental concerns, allowing Islamic investors to participate in sustainable development while adhering to their religious principles. By combining green finance with Islamic finance, green sukuk has the potential to attract a broader investor base, promote climate-conscious investments, and contribute to the global transition toward a low-carbon economy.

Impacts of Green Bonds/Sukuk on the Malaysian Economy and Investors

Green bonds and sukuk have emerged as transformative financial instruments in Malaysia, driving economic growth, environmental sustainability, and investor confidence. This section synthesizes existing literature on their multidimensional impacts. Green bonds and sukuk have enabled Malaysia to finance large-scale renewable energy and sustainable infrastructure projects, reducing reliance on fossil fuels and stimulating economic activity. For instance, green sukuk funded the UiTM Solar Power Sdn. Bhd. (USPSB), positioning Malaysia as a leader in low-carbon electricity production (Muhamat et al., 2024). These instruments attract foreign investments, particularly from ESG-focused investors, strengthening financial market stability and diversifying trade structures. The Malaysian government's regulatory support, including

tax incentives, has enhanced the appeal of green finance, fostering business opportunities in solar and hydropower industries critical for energy security (The Edge Malaysia, 2025).

Green bonds/sukuk are pivotal to Malaysia's net-zero carbon target by 2050. They fund climate mitigation projects, such as renewable energy and sustainable transport, reducing environmental pollution (Adrian, 2023). The World Bank's support for green finance in Malaysia has accelerated investments in energy efficiency, aligning with the Paris Agreement. By integrating these instruments, Malaysia balances economic growth with ecological preservation, mitigating climate-related costs (Malaysian Investment Development Authority, 2023).

Malaysia's Islamic finance leadership is reinforced by green sukuk, which attract Sharia-compliant ESG investors. The country dominates the global green sukuk market, diversifying its financial instruments and enhancing liquidity. Foreign capital inflows from institutional investors improve market resilience, while adherence to ESG standards elevates Malaysia's reputation as a sustainable finance hub (World Bank, 2019).

In conclusion, green bonds and sukuk have played a transformative role in Malaysia's economic, environmental, and financial landscape. These instruments have not only driven economic growth and job creation but have also strengthened the country's commitment to environmental sustainability and financial sector development. As Malaysia continues to position itself as a leader in sustainable finance, the ongoing expansion of the green bond market will be crucial in supporting long-term economic and environmental objectives.

Methodology

This research employs a systematic literature review (SLR) as the primary method for analyzing the findings. The SLR approach is a structured and transparent process that ensures the comprehensive collection, evaluation, and synthesis of existing literature from diverse sources, including academic journals, policy reports, industry analyses, and regulatory documents (Dhiman et al., 2023). By systematically reviewing a broad range of scholarly and industry-related materials, this study aims to provide an in-depth understanding of the challenges, impacts, and recommendations associated with green bonds and green sukuk.

The study follows a well-defined research protocol to enhance reliability and validity. The process begins with the formulation of key research questions related to green bonds and sukuk, focusing on their effectiveness, barriers to adoption, economic and environmental impacts, and potential strategies for improvement. Relevant literature is identified using structured keyword searches in leading academic databases such as Scopus, Web of Science, Google Scholar, and SSRN, as well as financial and policy reports from organizations like the Climate Bonds Initiative (CBI), the Securities Commission Malaysia, the World Bank, and the International Monetary Fund (IMF).

To ensure relevance and credibility, only peer-reviewed journal articles, government reports, and industry white papers published within the past 10–15 years are included. Older publications are considered if they provide foundational theories or historical context necessary for understanding the evolution of green finance. The collected literature is critically appraised using predefined inclusion and exclusion criteria based on relevance to green finance, methodological rigor, and contribution to the field.

Data from the selected studies are then analyzed using a thematic analysis approach, where findings are categorized into major themes as suggested by Naeem et al. (2023) such as policy and regulatory challenges, market adoption barriers, economic and environmental benefits, and strategies for enhancing green bond effectiveness. This thematic categorization allows for a structured synthesis of existing knowledge and helps identify gaps that require further exploration.

By employing a systematic and rigorous approach, this research ensures that its findings and recommendations are well-grounded in existing evidence. The methodology not only provides a comprehensive overview of the green bond and sukuk landscape but also contributes to the growing body of knowledge on sustainable finance, climate investment, and financial innovation. Future research can build on these findings by conducting empirical studies, comparative analyses across regions, or case studies on specific green bond issuances to further validate the conclusions drawn from this study.

Result and Discussions

Challenges of Green Bonds

Green bonds serve as a powerful tool for financing environmentally sustainable projects, yet they face several significant challenges that hinder their growth and effectiveness. These challenges must be addressed to strengthen the credibility and impact of green bonds in the global financial market.

One of the primary challenges facing green bonds is the absence of standardized regulations and definitions (Nguyen et al., 2024; Pham & Duc Huynh, 2020). Many jurisdictions lack a clear legal framework to define what constitutes a "green bond." While the European Union has developed a classification system, the U.S. Securities and Exchange Commission (SEC) and other regulatory bodies are still considering adopting similar frameworks (Gambro & Ruder, 2021). The inconsistency in standards creates confusion among investors and issuers, reducing transparency and trust in the green bond market. For instance, Malaysia's Sustainable and Responsible Investment (SRI) Sukuk Framework offers clear guidelines for green sukuk, but other regions may not have equivalent frameworks (Securities Commission Malaysia, 2019).

Next, greenwashing issue occurs when projects labeled as "green" fail to deliver meaningful environmental benefits (Dempere et al., 2024). Weak regulations allow some issuers to allocate green bond funds toward activities that do not significantly contribute to sustainability, such as minor efficiency upgrades in fossil fuel operations (Netto et al., 2020). For example, sustainability-linked bonds (SLBs) often have weaker requirements compared to green bonds, allowing companies like ENI to use funds for fossil fuel-related activities, raising concerns about the credibility of such instruments (Ul Haq & Doumbia, 2022). Stronger regulatory frameworks and third-party verification are necessary to enhance transparency and prevent greenwashing.

Besides, the costs associated with issuing green bonds—including certification, compliance, and ongoing monitoring—are significantly higher than those of conventional bonds. These expenses can deter smaller issuers and developing countries from participating in the green bond market. A case study in Cape Town highlighted that the high costs of certification and reporting made green bonds less financially attractive compared to regular bonds (Gorelick et al., 2024). While Malaysia provides incentives like the Green Technology Financing Scheme

(GTFS), which includes a 60% government loan guarantee and a 2% interest subsidy, not all countries offer similar support (Mohamad et al., 2024).

Many issuers, especially in emerging markets, lack awareness and understanding of how to structure and issue green bonds. The complexity of regulatory frameworks and overlapping certification requirements add further confusion. According to Bhutta et al. (2022), issuers often perceive green bonds as overly complex, leading to hesitancy in entering the market. Additionally, some investors mistakenly believe green bonds yield lower returns, discouraging investment in sustainable finance. Investors require clear and transparent reporting to verify that their funds are achieving genuine environmental benefits. However, many issuers struggle with inconsistent reporting practices, making it difficult to track the real impact of green bonds. The lack of standardized impact metrics, such as carbon emissions reductions, further complicates monitoring efforts. Addressing these issues requires stronger regulatory oversight and the implementation of globally accepted reporting frameworks.



Figure 1: Key Challenges Faced by Green Bonds and Green Sukuk Market

Figure 1 shows the key challenges that green bonds and green sukuk faced such as regulatory inconsistencies, greenwashing risks, high issuance costs, market complexity, and inadequate reporting standards. Overcoming these barriers will require the implementation of standardized regulations, increased transparency, and supportive financial incentives. By addressing these challenges, green bonds can play a more significant role in promoting sustainability and accelerating the global transition toward a low-carbon economy.

Recommendations

Green bonds are a vital financial tool for funding projects that generate positive environmental impacts. However, several challenges hinder their growth and effectiveness. This section outlines key recommendations to address these challenges and improve the overall success of green bonds in sustainable finance.

Since the inception of green bonds in 2007, the market has grown significantly but still represents only a small fraction of the global bond market. As of 2018, green bonds accounted for just 0.39% of total bonds issued worldwide. Key obstacles to further expansion include the absence of universally recognized standards, the risk of misleading claims (greenwashing), high issuance costs, and limited availability of green projects. To overcome these barriers, experts advocate for the development of globally recognized frameworks, improved transparency and reporting mechanisms, and collaboration with other financial instruments to enhance green finance accessibility, particularly in emerging markets (Deschryver & de Mariz, 2020).

To mitigate greenwashing risks, stricter disclosure regulations must be enforced. Issuers should be required to provide comprehensive and verifiable data on the environmental impact of their projects. Regular audits and independent verification post-issuance will help confirm that funds are allocated appropriately and environmental targets are met (Sneideriene & Legenzova, 2025). Educating investors on how to assess green bonds critically will also enhance market integrity and prevent misleading claims. Furthermore, governments and regulatory bodies should introduce clear and consistent definitions for green bonds to establish a baseline for environmental credibility (Idris et al., 2024).

One of the major deterrents to green bond issuance is the high cost associated with certification, compliance, and reporting. To offset these costs, issuers should leverage the "greenium," where investors may accept lower yields in exchange for the environmental benefits associated with these bonds (Caramichael & Andreas, 2022). Studies suggest that investors are increasingly willing to pay a premium for sustainable investments, which can help cover the expenses of third-party verification and ongoing impact assessments (García et al., 2023; Fatica et al., 2021). Additionally, streamlining the internal processes for issuing green bonds can lower administrative and transaction costs, making issuance more cost-effective (Huang et al., 2024). Governments and financial institutions should also explore subsidies, tax incentives, and risk-sharing mechanisms to further encourage green bond issuance and investment (Nguyen et al., 2024).

To boost awareness and participation in the green bond market, targeted educational campaigns should be launched to highlight their benefits and mechanisms (Cheteni et al., 2024; Anjanappa, 2024). Financial institutions, corporations, and policymakers should collaborate with organizations such as the Climate Bonds Initiative to develop educational materials, host workshops, and provide investor resources. Integrating green bonds into mainstream investment portfolios and demonstrating their financial performance and sustainability impact can also attract a broader range of investors. Promoting success stories and case studies of green bond-funded projects will further reinforce their credibility and effectiveness in achieving environmental and financial goals (Reboredo, 2018; Marín-Rodríguez et al., 2023).

Effective monitoring and reporting are crucial to ensuring the success and credibility of green bonds. To enhance transparency and accountability, standardized disclosure requirements should be established, incorporating measurable performance indicators and clear environmental impact metrics. Third-party verification should be mandated to validate the authenticity of green bonds and maintain investor confidence. Additionally, leveraging technology such as blockchain and real-time data tracking can improve accuracy and efficiency in monitoring project progress. Strengthening regulatory oversight through enhanced compliance measures and periodic evaluations will further promote trust in the green bond market (Chen & Long, 2023).



Figure 2: Recommendations to Overcome the Issues in Green Bonds and Green Sukuk.

Figure 2 shows several recommendations to overcome the issues in green bonds and green sukuk. By implementing these recommendations, the green bond market can overcome existing challenges and realize its full potential as a driving force for sustainable development. Establishing global standards, reducing issuance costs, increasing investor awareness, and improving transparency and reporting will help enhance the effectiveness and reliability of green bonds. These measures will not only encourage greater participation but also reinforce green bonds as a credible and impactful financial instrument in the fight against climate change and environmental degradation.

Conclusion

Green bonds and green sukuk have emerged as essential financial instruments for promoting sustainable development and addressing environmental challenges. Their role in funding renewable energy, green infrastructure, and climate-resilient projects has significantly contributed to economic growth, job creation, and environmental sustainability, particularly in Malaysia. As the country continues to position itself as a leader in sustainable finance, green bonds and sukuk provide an avenue for attracting both domestic and international investors who seek financial returns while supporting environmental stewardship.

Despite their potential, green bonds face several challenges, including a lack of standardization, the risk of greenwashing, high issuance costs, and limited awareness among investors and issuers. Addressing these challenges requires stronger regulatory frameworks, enhanced transparency in reporting, and financial incentives to encourage wider adoption. Governments, financial institutions, and investors must work together to establish clear global standards, promote accountability, and create more accessible opportunities for green financing.

Moving forward, further research and policy development should focus on refining green finance mechanisms, integrating technological advancements for better monitoring, and increasing investor confidence in sustainable financial instruments. By overcoming existing

barriers and implementing strategic recommendations, green bonds and sukuk can play a transformative role in accelerating the global transition toward a low-carbon, sustainable economy.

Acknowledgements

We sincerely appreciate the support from UiTM Cawangan Kedah and the Research and Publication Management Unit, whose assistance has been invaluable in the completion of this research. Their encouragement and resources have significantly contributed to the success of this research.

References

- Adrian, M. (2023). Sustainable sukuk issuance to boost Malaysia's net-zero ambitions - CapitalMonitor. *Capital Monitor*. <https://www.capitalmonitor.ai/analysis/sustainable-sukuk-issuance-to-boost-malysias-net-zero-ambitions/>.
- Alamgir, M., & Cheng, M. C. (2023). Do Green Bonds Play a Role in Achieving Sustainability?, *Sustainability*, 15(13), 10177.
- Anjanappa, J. (2024). Role of Private Sector in Driving the Green Bond Market in India, *SSPN*. <https://doi.org/10.2139/ssrn.4959091>
- Asian Development Bank (2024). *ASEAN+ Sustainable Bonds Highlights ABOAsianBonds Online*. [online] Available at: <https://asianbondsonline.adb.org/newsletters/aboesg202402.pdf>.
- Bhutta, U. S., Tariq, A., Farrukh, M., Raza, A., & Iqbal, M. K. (2022). Green bonds for sustainable development: Review of literature on development and impact of green bonds. *Technological Forecasting and Social Change*, 175(1), 121378. <https://doi.org/10.1016/j.techfore.2021.121378>.
- Caramichael, J. and Andreas, R. (2022). The Green Corporate Bond Issuance Premium *International Finance Discussion Papers 1346*. Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/IFDP.2022.1346>.
- Chen, X., & Long, W. (2023). To Enhance the Credibility of the Green Bond Market through Regulating GBERs: The Case of China. *Laws*, 12(6), 91. <https://doi.org/10.3390/laws12060091>.
- Cheteni, P., Matsongoni, H., & Umejisi, I. (2024). South Africa's green bond market: financing sustainable development. *Cogent Economics & Finance*, 13(1). <https://doi.org/10.1080/23322039.2024.2440446>.
- ClimateBondsInitiative.(2021).Reports.[online]Availableat: <https://www.climatebonds.net/resources/reports/green-bonds-state-market-2018>.
- Dempere, J., Alamash, E. and Mattos, P. (2024). Unveiling the truth: greenwashing in sustainable finance. *Frontier Sustain.* 5:1362051, 1-23. 10.3389/frsus.2024.1362051.
- Deschryver, P. and de Mariz, F. (2020). What Future for the Green Bond Market? How Can Policymakers, Companies, and Investors Unlock the Potential of the Green Bond Market? *Journal of Risk and Financial Management*, 13(3). <https://doi.org/10.3390/jrfm13030061>.
- Dhiman, R., Srivastava, V., Srivastava, A., Rajni, and Uppal, A. (2023). How to Plan and Write for Systematic Literature Review Papers in Management Domain, Rana, S., Singh, J. and Kathuria, S. (Ed.) *Advancing Methodologies of Conducting Literature Review in Management Domain (Review of Management Literature, Vol. 2)*, Emerald Publishing Limited, Leeds, pp. 37-55. <https://doi.org/10.1108/S2754-586520230000002003>.

- Fatica, S., Panzica, R., & Rancan, M. (2021). The pricing of green bonds: Are financial institutions special? *Journal of Financial Stability*, 54(100873), 100873. <https://doi.org/10.1016/j.jfs.2021.100873>
- Fu, C., Lü, L., & Pirabi, M. (2023). Advancing green finance: a review of sustainable development. *Digital Economy and Sustainable Development*, 1(20). <https://doi.org/10.1007/s44265-023-00020-3>.
- García, C. J., Herrero, B., Miralles-Quirós, J. L., & del Mar Miralles-Quirós, M. (2023). Exploring the determinants of corporate green bond issuance and its environmental implication: The role of corporate board. *Technological Forecasting and Social Change*, 189, 122379. <https://doi.org/10.1016/j.techfore.2023.122379>
- Gorelick, J., Cara, E. and Kavoo, G. (2024). The Fallacy of Green Municipal Bonds in Developing Countries. *World*, 5(4), 929–951. <https://doi.org/10.3390/world5040047>.
- Hakim, A. (2024). Financing Green: Exploring Sukuk as a Tool for Sustainable Investment in Islamic Finance, *SSRN*. <https://doi.org/10.2139/ssrn.4860671>.
- Huang, J., Liu, R., Wang, W., Wang, Z., Wang, C., & Jimmy) Jin, Y. (2024). Unleashing Fintech's potential: A catalyst for green bonds issuance. *Journal of International Financial Markets, Institutions and Money*, 93, 102009. <https://doi.org/10.1016/j.intfin.2024.102009>.
- Idris, S.H., Chang, L.W., Prihandono, I. *et al.* (2024). Green financing and climate change: challenges and regulatory mechanisms in Malaysia and Indonesia. *Clean Techn Environ Policy* **26**, 4471–4482 (2024). <https://doi.org/10.1007/s10098-024-02829-8>.
- Liu, F. H., & Lai, K. P. (2021). Ecologies of green finance: Green sukuk and development of green Islamic finance in Malaysia. *Environment and Planning A: Economy and Space*, 53(8), 0308518X2110383. <https://doi.org/10.1177/0308518x211038349>.
- Malaysian Investment Development Authority (2023). *Malaysia's Green Technology*. <https://www.mida.gov.my/wp-content/uploads/2024/07/Green-Technology-2022-2023.pdf>.
- Malaysian Sustainable Financial Initiative (2024). *Sustainable Finance: State of Market in Malaysia – MSFI*. [online] Available at: <https://www.msfi.com.my/sustainable-finance-state-of-market-in-malaysia/>
- Manaktala, S. (2020). Green Bonds in Sustainable Finance: Exploring the Case of India. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3644116>
- Marín-Rodríguez, N. J., González-Ruiz, J. D., & Valencia-Arias, A. (2023). Incorporating Green Bonds into Portfolio Investments: Recent Trends and Further Research. *Sustainability*, 15(20), 14897. <https://doi.org/10.3390/su152014897>.
- Mohamad, N., Isa, M. H. M., Othman, A., Samsudin, N., & Din, A. M. (2024). The Influence of External Factors on Malaysian Green Technology Financial Scheme (GTFS). *International Journal of Academic Research in Business and Social Sciences*, 14(9), 1521–1535.
- Muhamat, A. A., Nizar, N., Senawi, A. R., Karim, N. A., Kassim, S., Ismail, H. (2024). Green Sukuk Issuance: A Case Study of Public University in Malaysia, *Journal of Sustainability Science and Management*, 19(11), 210-222.
- Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2023). A Step-by-Step Process of Thematic Analysis to Develop a Conceptual Model in Qualitative Research. *International Journal of Qualitative Methods*, 22, 118. <https://doi.org/10.1177/16094069231205789>.

- Netto, S.V., Sobral, M.F.F., Ribeiro, A.R.B. and Soares, G.R. da L. (2020). Concepts and Forms of greenwashing: a Systematic Review. *Environmental Sciences Europe*, 32(1), 1-12. <https://doi.org/10.1186/s12302-020-0300-3>.
- Nguyen, P.-H., Thi Nguyen, L. - A., Le, H.-Q., & Tran, L.-C. (2024). Navigating critical barriers for green bond markets using A fuzzy multi-criteria decision-making model: Case study in Vietnam. *Heliyon*, 10(13), 1-23. <https://doi.org/10.1016/j.heliyon.2024.e33493>
- Pham, L., & Duc Huynh, T. L. (2020). How does investor attention influence the green bond market? *Finance Research Letters*, 101533. <https://doi.org/10.1016/j.frl.2020.101533>
- Radzi, R. M., & Muhamed, N. A. (2019). Are sukuk debt or equity? A classification of sukuk by regulatory bodies and credit rating agencies. *Journal of Emerging Economies and Islamic Research*, 7(2), 75. <https://doi.org/10.24191/jeeir.v7i2.8767>
- Reboredo, J. C. (2018). Green bond and financial markets: Co-movement, diversification and price spillover effects. *Energy Economics*, 74, 38–50. <https://doi.org/10.1016/j.eneco.2018.05.030>.
- Riaz, T., Aslam Izah Selamat, Nor, N. M., & Fahmi, A. (2024). Do Investors Get Benefits From Corporate Green Sukuk Issuance. *Journal of Islamic Monetary Economics and Finance*, 10(3). <https://doi.org/10.21098/jimf.v10i3.1944>
- Rose, P. (2020). Debt for Climate: Green Bonds and Other Instruments. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3750862>.
- Securities Commission Malaysia. (2019). *Sustainable and Responsible Investment Sukuk Framework An Overview 1 Sustainable and Responsible Investment Sukuk Framework: An Overview PART I*. <https://www.sc.com.my/api/documentms/download.ashx?id=84491531-2b7e-4362-bafb-83bb33b07416>
- Sneideriene, A., & Legenzova, R. (2025). Greenwashing prevention in environmental, social, and governance (ESG) disclosures: A bibliometric analysis. *Research in International Business and Finance*, 74, 102720. <https://doi.org/10.1016/j.ribaf.2024.102720>.
- Tadau News (2017). Solar energy firm Tadau raises RM250m via Malaysia's first green sukuk. <https://tadau.com.my/solar-energy-firm-tadau-raises-rm250m-via-malaysias-first-green-sukuk/>
- The Edge Malaysia. (2025). *The bright future of solar energy*. <https://theedgemaalaysia.com/node/743655>.
- Ul-Haq, I., Doumbia, D. (2022). Structural Loopholes in Sustainability-Linked Bonds. *Policy Research Working Papers*; 20200. World Bank, Washington, DC. <http://hdl.handle.net/10986/38131>
- World Bank. (2019). *Helping Malaysia Develop the Green Sukuk Market: Facilitating Sustainable Financing - Case Study*. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/586751546962364924/helping-malaysia-develop-the-green-sukuk-market-facilitating-sustainable-financing-case-study>.