

ASSESSING INDONESIA'S GREEN SUKUK PROJECTS THROUGH THE FRAMEWORK OF *FIQH AL-BI'AH*



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Abstract

Indonesia's sovereign green sukuk program has been evaluated almost exclusively through technical and regulatory criteria derived from secular sustainable finance standards. The normative dimension of Islamic environmental jurisprudence, known as *fiqh al-bi'ah*, has been structurally absent from this evaluative process. This study addresses that gap by constructing and applying the first operationalized *fiqh al-bi'ah* evaluation framework for green sukuk projects. Grounded in a qualitative normative—empirical research design, the study derives a three—dimensional analytical framework (Environmental Impact, Ecological Risk, and Public Benefit) from five core principles: *hifz al-bi'ah*, *la dharar wa la dirar*, *man' al-fasad fi al-arḍ*, *man' al-israf*, and *maṣlahah 'ammah*. The framework is applied to fifteen FY2024 project groups documented in Indonesia's Green Sukuk Allocation and Impact Report 2025 through a five—step structured evaluation procedure and a four—category typology: Direct Ecological Conformity, Indirect Conformity, Conditional Conformity, and Problematic Conformity. Results indicate that 66.7 percent of projects achieve Direct Ecological Conformity, 26.7 percent Indirect Conformity, and 6.7 percent Conditional Conformity with no project classified as Problematic. The study identifies three structural tensions: normative displacement, prospective greenwashing vulnerability, and competing ecological and social interests (*ta'aruf al-maṣalih*) in ecologically sensitive adaptation infrastructure. It contributes a replicable Islamic environmental governance instrument and advances *fiqh al-bi'ah* as an applied extension of *maqasid al-Shari'ah* with direct governance implications for Sharia supervisory boards, government issuers, and the Islamic ESG ecosystem.

Abstrak

Program green sukuk berdaulat Indonesia selama ini dievaluasi hampir sepenuhnya melalui kriteria teknis dan regulasi yang bersumber dari standar keuangan berkelanjutan sekular. Dimensi normatif yurisprudensi lingkungan Islam, yang dikenal sebagai *fiqh al-bi'ah*, tidak pernah hadir secara struktural dalam proses evaluasi tersebut. Penelitian ini mengisi kesenjangan tersebut dengan membangun dan mengaplikasikan kerangka evaluasi *fiqh al-bi'ah* pertama yang teroperasionalisasi untuk proyek-proyek green sukuk. Berlandaskan desain penelitian kualitatif normatif-empiris, penelitian ini menurunkan kerangka analitis tiga dimensi (Dampak Lingkungan, Risiko Ekologis, dan Manfaat Publik) dari lima prinsip inti: *hifz al-bi'ah*, *la dharar wa la dirar*, *man' al-fasad fi al-arḍ*, *man' al-israf*, dan *maṣlahah 'ammah*. Kerangka ini diterapkan pada lima belas kelompok proyek TA 2024 yang terdokumentasi dalam Green Sukuk Allocation and Impact Report 2025 melalui prosedur evaluasi terstruktur lima langkah dan tipologi empat kategori: Kesesuaian Ekologis Langsung, Kesesuaian Tidak Langsung, Kesesuaian Kondisional, dan Kesesuaian Bermasalah. Hasil evaluasi menunjukkan bahwa 66,7 persen proyek mencapai Kesesuaian Ekologis Langsung, 26,7 persen Kesesuaian Tidak Langsung, dan 6,7 persen Kesesuaian Kondisional dengan tidak ada proyek yang diklasifikasikan sebagai Bermasalah. Penelitian mengidentifikasi tiga ketegangan struktural: normative displacement, kerentanan greenwashing prospektif, dan konflik kepentingan ekologis

dan sosial (*ta'aruf al-maṣalih*) pada infrastruktur adaptasi iklim di kawasan ekologis sensitif. Penelitian ini berkontribusi pada instrumen tata kelola lingkungan Islam yang dapat direplikasi serta memposisikan *fiqh al-bī'ah* sebagai perluasan terapan dari *maqāṣid al-Sharī'ah* dengan implikasi tata kelola langsung bagi Dewan Pengawas Syariah, pemerintah sebagai penerbit, dan ekosistem Islamic ESG.

INTRODUCTION

The global climate crisis has fundamentally reshaped the architecture of international finance. Since the adoption of the Paris Agreement in 2015, sustainable debt instruments have accumulated to USD 6.9 trillion globally, with annual growth exceeding 30 percent.¹ Within this landscape, green sukuk has emerged as a distinctive instrument integrating Islamic financial governance with environmental sustainability objectives, operating under a dual – compliance framework that requires simultaneous adherence to Sharia principles and international environmental standards such as the ICMA Green Bond Principles.² For Muslim – majority economies, green sukuk thus functions not merely as a financing vehicle but as a normative policy signal linking Islamic governance with the global sustainability agenda.

Indonesia occupies a pioneering position in this market. Since issuing the world's first sovereign green sukuk in 2018 at USD 1.25 billion, earning a "Medium Green" rating from CICERO, the government has conducted seven successive issuances.³ By 2024, cumulative proceeds reached USD 6.60 billion (global series), IDR 40.60 trillion in domestic retail instruments, and IDR 31.17 trillion in domestic wholesale instruments, funding projects across sustainable water management, climate resilience, sustainable transport, green buildings, and renewable energy across more than 30 provinces.⁴ Table 1 summarizes this issuance trajectory.

Table 1. Summary of Indonesia's Sovereign Green Sukuk Issuances (2018–2024)

Year	Instrument	Proceeds	Key Eligible Sectors
2018	Global SNI (1st)	USD 1.25 billion	Water, Resilience, Energy, Transport, Land Management
2019	Global SNI (2nd)	USD 750 million	Water, Resilience, Transport, Green Building
2020	Global SNI (3rd)	USD 750 million	Water, Resilience, Energy Efficiency, Renewable Energy

¹ Clodagh Muldoon, Caroline Harrison, and Deepak Sharma, "Sustainable Debt Global State of the Market 2024" (London, 2025).

² Eunkyong Lee, Jee Young Kim, and Yoon Lee, "A Comparative Analysis of Green Sukuk and Green Bonds," *International Journal of Islamic and Middle Eastern Finance and Management*, 2025, <https://doi.org/10.1108/IMEFM-12-2024-0609>.

³ Wan Abdul Rahim Kamil et al., "Islamic Green Finance: Development, Ecosystem And Prospects" (Kuala Lumpur, 2019).

⁴ DJPPR, "Green Sukuk Allocation and Impact Report 2025" (Jakarta, 2025).

Year	Instrument	Proceeds	Key Eligible Sectors
2021	Global SNI (4th)	USD 750 million	Water, Resilience, Transport, Green Building
2022	Global SNI (5th)	USD 1.50 billion	Water, Resilience, Transport
2023	Global SNI (6th)	USD 1.00 billion	Water, Resilience, Transport, Renewable Energy
2024	Global SNI (7th) + ST + PBSG	USD 600 M + IDR 18.87 T (domestic)	Water, Resilience, Transport, Green Building, Renewable Energy
Cumulative	Global: USD 6.60 B	Retail: IDR 40.60 T	Wholesale: IDR 31.17 T

Source: DJPPR, *Green Sukuk Allocation and Impact Report 2025*.

The designation of green sukuk – eligible projects rests predominantly on technical and regulatory criteria: Climate Budget Tagging (CBT), SDG roadmap alignment, and quantified impact metrics including GHG reductions and flood – prone area mitigation.⁵ These criteria, while operationally robust within international sustainable finance conventions, represent an exogenous sustainability logic that is structurally disconnected from the normative foundations of Islamic law. The Islamic jurisprudential tradition governing human interaction with the natural world collectively known as *fiqh al – bī'ah* encompasses substantive principles including *la ḍarar wa la ḍirar* (prohibition of harm), *man' al-fasad fī al-arḍ* (prohibition of environmental destruction), *man' al-israf* (prohibition of waste), and *ḥifẓ al-bī'ah* (preservation of the environment) as an applied extension of the *maqāṣid al-Sharī'ah*.⁶ The critical problem is that Sharia compliance in green sukuk certification addresses the financial contract structure not the ecological substance of funded projects. A project may satisfy both CBT and SDG criteria while simultaneously violating *fiqh al-bī'ah* norms: generating soil disturbance, ecological risk, or indirect environmental harm that falls below technical reporting thresholds but constitutes *ḍarar* or *fasad* under Islamic jurisprudence. Without normative evaluation at the project level, green sukuk risks functioning as institutional isomorphism, Islamic labeling without Islamic substantive scrutiny of environmental outcomes.⁷

⁵ DJPPR; Luki Alfirman, "How ESG Factors Are Impacting Retail Debt Programs: Indonesia Experience on Issuing Retail Green Sukuk" (Jakarta, 2022), <https://thedocs.worldbank.org/en/doc/e0bd4e664be1e51804f9d84979d2102f-0430012022/related/IRDMC-2022-session-1-Indonesia.pdf>.

⁶ Abdullah bin Umar As – Sahibani, *Ahkamul Biah Fii Fiqhil Islami* (Riyadh: Dar Ibnul jauzi, 2008); Imam Sayyid Muhammadd al – Husaii As – Syairazi, *Al-Fiqhu Al-Biah* (Beirut: muassasah al – Wa'yu al – Islami, 2000); Ahmad bin Muhammad 'Ayid ar – Rifai Al – Juhni, "Madhohirul Muhafadhoh 'alal Biah Fi Al – Fiqh Al Islami," in *Majallah Az-Zahra Jilid 2* (al – Mutamar al – Ilmi al – Duali al – Khamis, 2024).

⁷ Burak Pirgaip and Ozgur Arslan – Ayaydin, "Exploring the Greenium in the Green Sukuk Universe: Evidence from the Primary Market," *International Journal of Islamic and Middle Eastern*

Systematic reviews confirm that the green sukuk literature is dominated by economic, regulatory, and market analyses, with normative jurisprudential dimensions remaining peripheral.⁸ Prior normative engagements including studies on *ri'ayah al-bī'ah* by Udzma and Faiz⁹, waqf-based marine financing by Nisak¹⁰, and KH. Ali Yafie's ecological framework by Adhi Purba and Mutafarida¹¹ have offered valuable conceptual foundations but have not constructed a structured, indicator-based evaluation model applicable to actual funded projects. Three specific gaps can be identified: (i) no study has operationalized *fiqh al-bī'ah* principles into measurable analytical indicators; (ii) no study has applied such a framework to project-level data from Indonesia's official impact reports; and (iii) no evaluative typology classifying projects by degrees of normative conformity has been theoretically constructed or empirically deployed.

Guided by these gaps, this study addresses four interrelated research questions. First, how can *fiqh al-bī'ah* be conceptually grounded within the *maqāṣid al-Sharī'ah* framework and operationalized as an evaluative instrument for assessing green sukuk projects? Second, what analytical dimensions and indicators can be derived from the core principles of *fiqh al-bī'ah* encompassing *ḥifẓ al-bī'ah*, *la ḍarar wa la ḍīrar*, *man' al-fasad fī al-arḍ*, *man' al-israf*, and *maṣlaḥah 'ammah* for structured project-level assessment? Third, how do the green sukuk-financed projects documented in Indonesia's Green Sukuk Allocation and Impact Report 2025 conform to the constructed *fiqh al-bī'ah* framework across dimensions of environmental impact, ecological risk, and public benefit? Fourth, what normative tensions, theoretical implications, and practical governance recommendations arise from this evaluation?

This study makes three distinct contributions. Theoretically, it provides the first systematic operationalization of *fiqh al-bī'ah* as an evaluative model translating classical *fiqh* sources (As-Sahibani, As-Syairazi, Al-Juhni) and contemporary *maqāṣid*-based extensions (Yusuf al-Qaradawi) into a structured three-dimensional indicator framework, advancing *fiqh al-bī'ah* from a descriptive legal field to an applied evaluative instrument. Methodologically, it develops an original evaluation typology Direct Ecological Conformity, Indirect Conformity, Conditional Conformity, and Problematic Conformity providing a replicable tool for normative audit of Islamic green finance. Empirically, it conducts the first project-level normative evaluation of Indonesia's sovereign green sukuk portfolio using the Ministry of Finance's Green Sukuk Allocation

Finance and Management 17, no. 3 (2024): 423–40, <https://doi.org/10.1108/IMEFM-05-2023-0186>.

⁸ Syamsi Mustofa Singgih Prayogo, Aji Raditya, and Adel Sarea, "A Bibliometric Analysis of Green Sukuk Literature," *Review of Islamic Social Finance and Entrepreneurship*, 2024, 184–98, <https://doi.org/10.20885/RISFE.vol3.iss2.art6>; Indar Fauziah Ulfah et al., "A Structured Literature Review on Green Sukuk (Islamic Bonds): Implications for Government Policy and Future Studies," *Journal of Islamic Accounting and Business Research* 15, no. 7 (2023): 1118–33, <https://doi.org/10.1108/JIABR-10-2022-0255>.

⁹ Linda Amala Udzma and Mohammad Muqronul Faiz, "The Existence Of Green Sukuk in Indonesia: An Analysis Of Yusuf Al-Qaradawi's Environmental Fiqh," *Proceedings of ICCoLaSS: International Collaboration Conference on Law, Sharia and Society*, 2024, 70–81.

¹⁰ Khoirun Nisak, "Cash Waqf Linked Blue Sukuk: An Analysis of Fiqh Al-Bī'ah," *Prosiding Konferensi Integrasi Interkoneksi Islam Daan Sains Ke-5* 5 (2023): 163–68.

¹¹ Ilyas Adhi Purba and Binti Mutafarida, "Eksistensi Green Sukuk Di Indonesia: Analisis Terhadap Fiqih Lingkungan Kh. Ali Yafie," *Jurnal Adz-Dzahab: Jurnal Ekonomi Dan Bisnis Islam* 8, no. 2 (2023): 167–79, <https://doi.org/10.47435/adz-dzahab.v8i2.1687>.

and Impact Report 2025 as primary data, making the analysis responsive to the most current available evidence.

Beyond its scholarly contributions, the study carries actionable implications for three domains: Sharia supervisory boards seeking to integrate normative environmental criteria into green sukuk certification; the government as issuer, for incorporating *fiqh al-bī'ah* indicators into project selection and reporting frameworks; and the broader Islamic sustainable finance ecosystem, for advancing toward a genuinely Islamic ESG paradigm that is normatively coherent not merely procedurally compliant.

METHODS

This study employs a qualitative normative—empirical research design. The normative dimension involves the systematic reading, interpretation, and operationalization of classical and contemporary Islamic jurisprudential sources to construct an evaluative framework grounded in *fiqh al-bī'ah* principles. The empirical dimension involves the structured application of that framework to primary project—level data drawn from official government impact reports. This dual—axis design is consistent with established methodology for Islamic legal research that bridges doctrinal analysis with concrete empirical contexts.¹² The qualitative orientation is further justified by the evaluative nature of the research questions, which require interpretive judgment grounded in legal norms rather than statistical inference, a methodological position supported by prior studies employing qualitative—normative approaches in green sukuk research.¹³

This study draws on two categories of primary sources, stratified by their function in the research design. The primary empirical source is the Green Sukuk Allocation and Impact Report 2025, published by the Directorate General of Budget Financing and Risk Management (DJPPR) of the Ministry of Finance, Republic of Indonesia. This report provides project—level descriptions, sectoral allocations, impact metrics, and geographic distributions for all green sukuk instruments issued in fiscal year 2024 comprising the Global Sovereign Green Sukuk (SNI 0754), and the domestic ST 012T4, ST 013T4, and PBSG001 series. The primary normative—legal sources are classical *fiqh* texts establishing the *qawa'id fiqhiyyah* (legal maxims), supplemented by contemporary *fiqh al-bī'ah* literature and *maqāṣid*—based scholarship. Secondary sources include the ICMA Guidance on Green, Social and Sustainability Sukuk (2024), comparative empirical studies on Indonesia's green sukuk, and recent literature on greenwashing risks in Islamic sustainable finance.¹⁴

¹² Monsurat Ayojimi Salami, Mustapha Abubakar, and Harun Tanrivermiş, "The Best Methodology Recommended for Research in Islamic Finance," in *Teaching and Research Methods for Islamic Economics and Finance*, 1st Editio (Routledge, 2022), 14; Sanaa Kadi, "Research Methods for Islamic Banking and Finance Law: Interdisciplinary Research Method," *European Journal of Islamic Finance* 9, no. 2 (2022): 1—8, <https://doi.org/https://doi.org/10.13135/2421-2172/6628>.

¹³ Amal Zainun Naim, Yustafad, and Muhammad Fathur Reza, "Effectiveness of Green Sukuk in Indonesia: Emission Measurement, Sharia Law, and Transparency," *Jurnal At-Tamwil: Kajian Ekonomi Syariah* 8, no. 1 (2026): 14—33, <https://doi.org/https://doi.org/10.33367/at-tamwil.v8i1.8173>; Delta Khairunnisa, Suhel, and Imam Asngari, "Integrating ESG and Maqashid Syariah for Sustainable Islamic Finance in Indonesia," *JIMKES* 13, no. 6 (2025): 4525—38, <https://doi.org/10.37641/jimkes.v13i6.4025>.

¹⁴ Sheila Noor Baity and Titie Rachmiati Poetri, "Ensuring the Credibility and Sharia Compliance of Sovereign Green Sukuk to Achieve Net Zero Emissions in Indonesia," *SERAMBI: Jurnal Ekonomi Manajemen Dan Bisnis Islam* 7, no. 3 (August 20, 2025): 315—34, <https://doi.org/10.36407/serambi.v7i3.1683>; Sayyidetul Magfiroh and Umi suwati Risnaeni,

The unit of analysis is the individual funded project, as enumerated in the project allocation tables (Tables 1 – 5) of DJPPR (2025). This project – level focus is a deliberate and critical methodological choice that distinguishes this study from prior work that has evaluated green sukuk at the sectoral or aggregate portfolio level. Sectoral – level analysis obscures the normative variation that exists within sectors: for instance, the "Sustainable Transport" sector contains both high – impact electric railway operations and supporting infrastructure projects with distinct ecological risk profiles. Project – level assessment enables a more granular and jurisprudentially accurate evaluation, consistent with the principle that *fiqh al-bī'ah* norms apply to specific human actions and their ecological consequences not to abstract categories. This approach follows the methodological orientation established by Bowen for document – based qualitative analysis, in which purposively selected official documents serve as the primary data corpus for systematic thematic and evaluative coding.¹⁵

The analytical framework operationalizes *fiqh al-bī'ah* through three evaluative dimensions derived from the five core principles elaborated in Section 2: (i) Environmental Impact Dimension, the degree to which a project positively or negatively affects environmental conditions, including GHG mitigation, water conservation, ecosystem services, and land use; (ii) Ecological Risk Dimension, the presence and severity of potential ecological harm arising from project implementation, including habitat disruption, hydrological alteration, soil disturbance, and pollution risk, evaluated against the *la ḍarar* and *man' al-fasad* principles; and (iii) Public Benefit Dimension, the extent to which project benefits are distributed to the public (*maṣlahah 'ammah*), encompassing food security, water access, climate adaptation, and community resilience. This three – dimensional framework is consistent with the World Bank ESF integration approach for green sukuk and extends it by grounding the impact and risk dimensions explicitly in Islamic jurisprudential norms rather than secular environmental governance criteria.¹⁶

The evaluation proceeds through five sequential analytical steps, as outlined in Table 2. The procedure is informed by thematic document analysis and adapted to the normative – legal context of *fiqh al-bī'ah* evaluation.¹⁷ Crucially, Steps 3 – 5 involve interpretive judgment grounded in the jurisprudential framework constructed in Section Theoretical Framework, not mechanical measurement, a distinction that reflects the nature of normative – empirical Islamic legal research, where the researcher functions as a jurist mapping facts to legal norms, not an auditor applying fixed metrics.¹⁸ The evaluation typology in Step 5; Direct, Indirect, Conditional, and Problematic Conformity is applied consistently across all projects to enable structured inter – project comparison and the generation of a comprehensive evaluation matrix in Section 5.

"Greenwashing in Sukuk Fund Allocation on the IDX: Analysis with Three Sharia ESG Discrepancy Indicators," *Dinasti International Journal of Economics, Finance & Accounting* 7, no. 1 (2026): 517 – 526, <https://doi.org/https://doi.org/10.38035/dijefa.v7i1.6457>.

¹⁵ Glenn A Bowen, "Document Analysis as a Qualitative Research Method," *Qualitative Research Journal* 9, no. 2 (August 3, 2009): 27 – 40, <https://doi.org/10.3316/QRJ0902027>.

¹⁶ Wan Mohd Zulhafiz Wan Zahari, "Operationalising Green Sukuk within the World Bank Environmental and Social Framework," *Discover Environment* 3, no. 1 (2025): 288, <https://doi.org/10.1007/s44274-025-00490-6>.

¹⁷ Bowen, "Document Analysis as a Qualitative Research Method."

¹⁸ Kadi, "Research Methods for Islamic Banking and Finance Law: Interdisciplinary Research Method."

Table 2. *Fiqh al-Bī'ah* Evaluation Procedure

Step	Stage	Procedure	Output
1	Project Identification	Extract all funded projects per sukuk series from DJPPR (2025), Tables 1 – 5	Project inventory across 5 sukuk series (2024)
2	Data Extraction	Retrieve project – level data: sector, location, amount, GHG reduction, water storage, flood area, and ecological risk indicators	Structured project data matrix
3	Indicator Mapping	Map each project against the 3 – dimensional <i>fiqh al-bī'ah</i> indicator framework (environmental impact, ecological risk, public benefit)	Indicator scores per project
4	Risk Assessment	Evaluate potential ecological harm: land disturbance, pollution risk, habitat disruption, hydrological impact	Risk classification per project
5	Typology Classification	Assign each project to one of four normative conformity categories: Direct, Indirect, Conditional, or Problematic	Final evaluation matrix (Table 5)

Source: Authors' construction.

RESULT AND DISCUSSION

RESULT

Theoretical Framework: *Fiqh Al-Bī'ah* As Evaluative Model

The term *fiqh* carries two meanings: linguistically, *al-fahm* (understanding or comprehension); terminologically, it denotes knowledge of the Sharia rulings concerning the acts of the *mukallaf* (legally responsible person), derived from their detailed evidences.¹⁹ The term *bī'ah* (بيئة) derives from the root (بَوَّأَ), meaning to settle, to prepare a place of residence, or to arrange an abode.²⁰ Khofar defines *bī'ah* as a large space in which humans and living beings dwell, develop, and conduct their activities. As – Sahibani distinguishes two scopes: *bī'ah al-ṭabī'iyyah* (natural environment; water, air, soil, plants, animals) and *bī'ah al-waḍ'iyyah* (artificial or built environment; human constructions and their ecological interactions). On this basis, *fiqh al-bī'ah* is defined as the body of Islamic legal rulings governing human interaction with all environmental elements including

¹⁹ Musthofa Al – Khin, Musthofa Al – Bugho, and A'li Al – Sariji, *Al-Fiqhul Manhaji Ala Madzhabil Imam Syafii* (Damaskus: Dar al – Qolam li al – thoba'ah wa al – Nasyr, 1992).

²⁰ Abi fadhl Al – Misri, *Lisanul 'Arab Jilid 1* (Beirut: Daar Shoodir, n.d.); Abu Mansur Al – Azhari, *Tahdzhibul Lughoh Jilid 2* (Riyadh: Darul kitab al – arabi, 1967).

prohibitions on pollution, destruction, and resource excess, as well as obligations of preservation and stewardship.²¹ Protecting the environment from damage is considered obligatory (*wajib*) according to Sharia, as affirmed in QS. al – Baqarah: 27 and the general legal maxims of the *qawa'id al-fiqhiyyah*.²²

The four classical domains of *fiqh al-bī'ah*; preserving the environment against water pollution, air degradation, soil contamination, and destruction of vegetation, correspond directly to the natural elements most affected by infrastructure projects.²³ As – Syairazi identifies the principal sources of air pollution as combustion of fuels, industrial emissions, incineration, and greenhouse gases a list strikingly congruent with the impact categories tracked in Indonesia's green sukuk reporting. Al – Najar similarly identifies water pollution sources as domestic sewage, industrial chemical discharge, agricultural pesticide runoff, and oil contamination categories directly implicated in dam, irrigation, and urban water infrastructure projects. Imam Ibn Taymiyyah affirms the legal consensus that inanimate matter in its original state is pure (*ṭahūr*) and that any deviation from this purity through human action constitutes a violation requiring juridical attention.²⁴ Together, these classical authorities establish *fiqh al-bī'ah* as a juridically comprehensive framework capable of evaluating the ecological character of modern state – funded projects.

The classical *maqāṣid al-Sharī'ah* framework, systematized by Imam al – Shaṭībī and elaborated by al – Raysunī²⁵, establishes five essential objectives of Islamic law (*dharūriyyat al-khamsah*): preservation of religion (*ḥifẓ al-dīn*), of life (*ḥifẓ al-nafs*), of lineage (*ḥifẓ al-nasl*), of intellect (*ḥifẓ al-'aql*), and of wealth (*ḥifẓ al-mal*). Contemporary scholarship increasingly recognizes that the integrity of the natural environment constitutes a precondition for all five classical *maqāṣid*: environmental degradation directly threatens human life, public health, food security, and inter – generational wealth rendering environmental preservation a functional *dharūriyyah* in its own right. Khuluq and Asmuni demonstrate that *ḥifẓ al-bī'ah* has evolved from a peripheral concern in classical *fiqh* to an integral component of *maqāṣid al-Sharī'ah*, positioned as both a foundational precondition and a systemic enabler of the classical five objectives in the context of global climate change.²⁶ Auda, employing a systems approach to *maqāṣid*, similarly

²¹ As – Sahibani, *Ahkamul Biah Fii Fiqhil Islami*.

²² Abdullah bin Muhammad At – Thoyyar, Abdullah bin Muhammad Al – Muthallaq, and Muhammad bin Ibrahim Al – Musa, *Al-Fiqh Muyassar*, Cet. 2 (Riyadh: Madaar al – wathon li an – nasyr, 2012).

²³ As – Sahibani, *Ahkamul Biah Fii Fiqhil Islami*; As – Syairazi, *Al-Fiqhu Al-Biah*.

²⁴ Ahmad bin Taimiyah, *Majmu' Al-Fatawa Jilid 21* (Riyadh: Dar 'alam al – Kutub, 1985).

²⁵ Ahmad Al – Raysuni, *Imam Al-Shatibi's Theory of the Higher Objectives and Intents of Islamic Law* (London: the international institute of islamic thought, 2011).

²⁶ M. Khusnul Khuluq and Asmuni Asmuni, "Hifz Al – Bi'ah as Part of Maqashid Al – Shari'ah and Its Relevance in the Context of Global Climate Change," *Indonesian Journal of Interdisciplinary Islamic Studies (IJIIS)* 7, no. 2 (2025), <https://doi.org/https://doi.org/10.20885/ijis.vol7.iss2.art3>.

argues that environmental preservation is not an addition to *maqasid* but an emergent property of their systemic interaction.²⁷

This study adopts the position that *fiqh al-bī'ah* constitutes an applied extension of *maqasid al-Sharī'ah* providing the jurisprudential operationalization through which the abstract objective of *ḥifẓ al-bī'ah* is translated into actionable legal norms governing specific human activities. This relationship is not merely conceptual: it has direct implications for how green sukuk projects are assessed. A project that satisfies the technical criteria of international green finance may nonetheless fail the *maqasid* test if it generates *ḍarar* (ecological harm) to communities dependent on the affected ecosystem, contradicts *ḥifẓ al-nasl* by degrading inter–generational ecological resources, or undermines *ḥifẓ al-mal* through displacement of community livelihoods. The framework constructed in this section operationalizes this theoretical position into an evaluative instrument applicable to the project–level data available in DJPPR 2025.²⁸

Drawing on the three tiers of literature outlined in method; classical *qawā'id fiqhiyyah*, the *fiqh al-bī'ah* corpus in Arabic, and contemporary *maqasid*–based scholarship, this study identifies five core principles that collectively constitute the normative architecture of *fiqh al-bī'ah*. Each principle is grounded in primary textual evidence (Qur'an or *fiqh* maxims) and carries a specific operational meaning for green sukuk project evaluation. The *qa'idah* of *la ḍarar wa la ḍirar* "no harm shall be inflicted or reciprocated" is derived directly from the Prophetic hadith transmitted by Ibn Majah (No. 2341) and codified in al–Suyūṭī's *al-Ashbah wa al-Naẓa'ir*; its application to environmental governance has been elaborated in Al–Juhni²⁹ and formally operationalized as an environmental regulatory principle in recent jurisprudential studies.³⁰ Table 3 presents the full five–principle matrix with textual bases and operational meanings.

Table 3. Core Principles of *Fiqh al-Bī'ah*: Textual Basis and Operational Meaning for Green Sukuk Evaluation

Principle	Textual & Classical Basis	Operational Meaning for Green Sukuk Evaluation
حِفْظُ الْبَيْئَةِ	QS. al–Baqarah: 30 (mandate of khilafah); QS. al–A'raf: 56;	Projects must actively preserve or restore ecological conditions, not merely avoid

²⁷ Jasser Auda, *Maqasid Al-Shariah as Philosophy of Islamic Law: A Systems Approach* (Virginia: International Institute of Islamic Thought, 2008).

²⁸ DJPPR, "Green Sukuk Allocation and Impact Report 2025."

²⁹ Al–Juhni, "Madhohirul Muhafadhoh 'alal Biah Fi Al–Fiqh Al Islami."

³⁰ Muhammad Ajmal, Sadheer (Mufti Muhammad Hassan) Khan, and Awais Ud din Khan, "A Thematic Study of the Hadith 'La Darar Wa La Dirar' Regarding Environmental Balance," *Journal of Religion and Society* 4, no. 1 (September 2025): 770–76, <https://doi.org/10.5281/zenodo.17102163>; Ismail Jalili et al., "Role of Qaw 'id Fiqhiyyah in Promoting Green Investment within Islamic Economics: Theoretical and Practical Frameworks," *Journal of Islamic Thought and Civilization* 15, no. 1 (April 25, 2025): 202–23, <https://doi.org/10.32350/jitc.151.12>.

(Preservation of the Environment)	affirmed in As – Sahibani (2008); Al – Juhni (2024)	harm. The environment is an Amanah (trust) held by humans on behalf of God.
لَا ضَرَرَ وَلَا ضِرَارَ (No Harm Shall Be Inflicted or Reciprocated)	Hadith riwayat Ibn Majah (No. 2341); elaborated in al – Suyūṭī, <i>al-Ashbah wa al-Naẓa'ir</i> ; Al – Juhni (2024); operationalized for environment in Muhammad Ajmal et al. (2025)	Projects must not generate direct (<i>ḍarar</i>) or indirect (<i>ḍirar</i>) ecological harm including soil disturbance, water pollution, air degradation, or habitat disruption regardless of intent.
مَنْعُ الْفَسَادِ فِي الْأَرْضِ (Prohibition of Corruption/Destruction on Earth)	QS. al – Baqarah: 27; QS. al – A'raf: 56; QS. Muḥammad: 22 – 23; tafsīr in al – Qurṭubī (1984); At – Ṭabarī (1984)	Projects must not cause material destruction of land, water bodies, vegetation, or ecosystem integrity. <i>Fasad</i> encompasses both physical destruction and functional degradation of natural systems.
مَنْعُ الْإِسْرَافِ (Prohibition of Waste and Excess)	QS. al – An'am: 31 ('do not be wasteful'); QS. al – Isra': 26 – 27; Al – Juhni (2024); At – Thoyyar et al. (2012)	Projects must demonstrate resource efficiency: use of water, land, energy, and materials must not exceed what is necessary. <i>Israf</i> in resource use is prohibited even if the purpose is beneficial.
الْمَصْلَحَةُ الْعَامَّةُ (Public Benefit/Common Good)	Al – Najar (2004); At – Thoyyar et al. (2012); al – Raysuni (2005) on Imam al – Shatibi's theory of maṣlaḥah; Auda (2019)	Ecological benefits of projects must extend to the public (communities, ecosystems, future generations), not merely serve technical or economic targets. <i>Maṣlaḥah</i> requires measurable social and environmental distribution of benefits.

Source: Authors' construction based on As-Sahibani (2008); As-Syairazi (2000); Al-Juhni (2024); At-Thoyyar et al. (2012); Al-Najar (2004); Al-Qurṭubī (1984); Murad (2016); al-Raysuni (2005); Auda (2019); Muhammad Ajmal et al. (2025).

The five principles in are operationalized into three evaluative dimensions, each comprising concrete indicators extractable from the project – level data in DJPPR 2025. This three – dimensional framework is the core methodological novelty of this study: it translates jurisprudential norms into observable, data – grounded assessment criteria, enabling systematic comparison across projects rather than impressionistic case – by – case judgment. The Environmental Impact Dimension reflects the positive ecological outcomes of a project, measured through GHG reductions, water storage additions, flood area mitigation, and renewable energy generation indicators directly derivable from DJPPR 2025 impact

tables and linked to the *ḥifẓ al-bī'ah* and *man' al-israf* principles. The Ecological Risk Dimension reflects the potential for project implementation to generate *ḍarar* or *fasad*, including land disturbance, pollution risk, and habitat disruption corresponding to the *la ḍarar* and *man' al-fasad* principles. The Public Benefit Dimension assesses the distribution and scale of positive impacts on communities and future generations, grounded in *maṣlahah 'ammah* and the three classical *maqāṣid* of *ḥifẓ al-nafs*, *ḥifẓ al-nasl*, and *ḥifẓ al-māl*. Table 4 presents the full indicator set.

Table 4. Three-Dimensional *Fiqh al-Bī'ah* Analytical Framework: Indicators and Derivations

Dimension	Analytical Indicators	Derived Principle(s)	Data Source
Dimension 1 Environmental Impact	• GHG emission reduction (tCO₂e/year, actual vs. expected) • Water storage capacity added (million m³) • Flood – prone area reduced (hectares) • Ecosystem services restored (irrigation area, watershed) • Renewable energy generated (MWh/year)	<i>Ḥifẓ al-bī'ah; Man' al-israf</i>	DJPPR (2025), Tables 1 – 5: GHG metrics, water storage, flood area, irrigation data
Dimension 2 Ecological Risk	• Land disturbance level (excavation, drilling, construction footprint) • Soil pollution risk (chemical, sediment, waste) • Water pollution risk (turbidity, chemical runoff) • Air pollution risk (dust, emissions during construction) • Habitat/ecosystem disruption (flora, fauna, hydrology)	<i>La ḍarar wa la ḍirar; Man' al-fasad fī al-arḍ</i>	DJPPR (2025) project descriptions; Environmental risk typology from Gkousis et al. (2022); Sharmin et al. (2023)
Dimension 3 Public Benefit	• Number of direct beneficiaries (persons/households) • Access to clean water (household connections) • Food security contribution (irrigated agricultural area, ha)	<i>Maṣlahah 'ammah; Ḥifẓ al-nafs; Ḥifẓ al-nasl</i>	DJPPR (2025): beneficiary data, SDG mapping; Al – Najjar (2004); At – Thoyyar et al. (2012)

- Climate resilience enhancement (community – level adaptation)
- SDG alignment (SDGs 6, 11, 13, 7 explicitly cited)

Source: Authors' construction.

Based on the three – dimensional framework, this study constructs a four – category evaluation typology that classifies each green sukuk – funded project according to its degree of normative conformity with *fiqh al-bī'ah*. The typology is designed to be graduated rather than binary, reflecting the jurisprudential reality that Islamic law operates on a spectrum of permissibility (*aḥkam al-taklīfiyyah*: obligatory, recommended, permissible, disliked, prohibited) rather than a simple halal/haram dichotomy. The four categories; Direct Ecological Conformity, Indirect Conformity, Conditional Conformity, and Problematic Conformity map onto this spectrum, with Direct Conformity corresponding to unambiguously positive *fiqh* standing and Problematic Conformity requiring exceptional justification under *ḍarūrah* (necessity) or prevailing *maṣlaḥah*. This typology extends prior taxonomic work on green sukuk assessment³¹ by grounding each category explicitly in *fiqh al-bī'ah* principles and linking classification criteria to the observable indicators in Table 4. Table 5 presents the full typology.

Table 5. *Fiqh al-Bī'ah* Evaluation Typology for Green Sukuk Projects

Conformity Category	Description	<i>Fiqh al-Bī'ah</i> Standing	Classification Criteria
Direct Ecological Conformity	Project directly preserves, restores, or substantially improves ecological conditions with minimal ecological risk.	<i>High, fully consistent with fiqh al-bī'ah</i>	High environmental impact score; Low ecological risk; Significant public benefit; No material ḍarar or fasad generated
Indirect Conformity	Project supports environmental sustainability indirectly (enabling infrastructure, monitoring, data systems). Ecological benefit is real but mediated.	<i>Moderate, consistent with fiqh al-bī'ah through maṣlaḥah pathway</i>	Moderate environmental impact; Low – medium ecological risk; Notable public benefit via system – level function

³¹ Ulfah et al., "A Structured Literature Review on Green Sukuk (Islamic Bonds): Implications for Government Policy and Future Studies"; Udzma and Faiz, "The Existence Of Green Sukuk in Indonesia: An Analysis Df Yūsuf Al – Qaraḍ wī's Environmental Fiqh."

Conditional Conformity	Project generates environmental benefits but also carries ecological risk requiring specific mitigation measures. Conformity depends on implementation safeguards.	<i>Conditional, permissible (ja'iz) subject to mitigation; contested under la qadar principle</i>	Mixed environmental impact; Elevated ecological risk; Benefit realized only if fasad is effectively mitigated
Problematic Conformity	Project's ecological risk is significant and may override or obscure environmental benefits. Requires explicit normative justification under maṣlaḥah or qarūrah.	<i>Low, requires exceptional justification (qarūrah or prevailing maṣlaḥah); potential fasad unresolved</i>	Low or indirect environmental impact; High ecological risk without demonstrated mitigation; Benefit primarily economic/technical rather than ecological

Source: Authors' construction.

Empirical Context: Green Sukuk in Indonesia

Indonesia's sovereign green sukuk program is the most extensive Sharia – compliant green sovereign financing initiative globally. Initiated in February 2018 with the world's first sovereign green sukuk issuance of USD 1.25 billion, the program has grown continuously across seven successive annual issuances in both international and domestic markets.³² By fiscal year 2024, cumulative proceeds reached USD 6.60 billion through the Global Sovereign series (SNI), IDR 40.60 trillion through the Domestic Retail series (ST), and IDR 31.17 trillion through the Domestic Wholesale series (PBSG001) in other words, these proceeds formed a total mobilized capital base equivalent to approximately USD 11.53 billion across the program's seven – year history. In FY2024 specifically, the government raised USD 600 million through a 30 – year global sukuk (SNI 0754, coupon 5.50%), IDR 9.92 trillion through two domestic retail tranches (ST 012T4 and ST 013T4, coupon 6.55%), and IDR 8.95 trillion through the domestic wholesale instrument (PBSG001).

The cumulative sectoral allocation across 2018 – 2024 reveals a pronounced concentration in water infrastructure and climate resilience, which together account for 69.21 percent of total proceeds. Sustainable Water and Wastewater Management dominates at 43.25 percent (IDR 72.94 trillion), driven by Indonesia's national water and food security programs requiring large – scale dam construction, irrigation rehabilitation, and drinking water system expansion. Sustainable Transport represents 21.61 percent (IDR 35.97 trillion), reflecting investment in zero and low – carbon railway connectivity. Renewable energy and energy efficiency together account for 6.34 percent, while green buildings and sustainable land management remain marginal contributors at under 0.30 percent cumulatively.³³ This sectoral structure is critical for the subsequent *fiqh al-bī'ah*

³² DJPPR, "Green Sukuk Allocation and Impact Report 2025."

³³ DJPPR.

evaluation, as it determines which normative principles are most frequently invoked and which ecological risk dimensions are most pertinent. Table 6 presents the full cumulative sectoral breakdown.

Table 6. Cumulative Green Sukuk Proceeds Allocation by Eligible Sector (2018-2024)

Eligible Sector	IDR (trillion)	USD (billion)	Share (%)
Sustainable Water & Wastewater Management	72.94	4.99	43.25%
Resilience to Climate Change/DRR	44.33	2.99	25.96%
Sustainable Transport	35.97	2.49	21.61%
Renewable Energy	5.96	0.41	3.59%
Energy Efficiency	4.64	0.32	2.75%
Waste to Energy & Waste Management	4.39	0.30	2.58%
Green Buildings	0.27	0.02	0.16%
Sustainable Management of Natural Resources	0.18	0.01	0.10%
TOTAL	168.68	11.53	100%

Source: DJPPR, *Green Sukuk Allocation and Impact Report 2025*

The FY2024 project portfolio covering both new financing (FY2024 projects) and refinancing (FY2023 projects) across the four sukuk series encompasses a total of 28 distinct funded activities distributed across four primary project typologies: (i) dam construction and revitalization, including large – scale multi – purpose dams (Keureuto, Rukoh, Cibeet, Bagong, Bulango Ulu, Lau Simeme, and 15 others) with an aggregate FY2024 water storage capacity contribution of approximately 632 million m³; (ii) railway infrastructure development, spanning the Medan – Binjai airport extension, Jakarta Metropolitan Electric Rail (KRL), Sumatra passenger and freight lines, and the Makassar – Parepare Line; (iii) flood control and coastal protection structures, including the IKN Nusantara flood management system and 18 flood control structures across 12 provinces; and (iv) renewable energy and innovation projects, including rooftop solar PV installations at Presidential Palaces and Volcano Observation Posts, dew – harvesting water technology, and BMKG climate observation infrastructure. Geographic coverage is national in scope, spanning 33 of Indonesia's 38 provinces.³⁴ Table 7 details project characteristics by sukuk series.

Table 7. FY2024 Green Sukuk Project Characteristics by Series and Sector

Sukuk Series	Sector	Project Type	Geographic Scope	Allocation
SNI 0754	Sustainable Water	Dam construction &	Aceh, South Sumatra,	IDR 8.46 T (93.95%)

³⁴ DJPPR.

(USD 600 M)		revitalization (11 dams, 1 lake)	West – Central – East Java, Maluku, NTB, NTT	
SNI 0754 (USD 600 M)	Resilience/DRR	Flood control IKN; Groundwater network rehabilitation	East Kalimantan; Aceh, NTT, West Papua	IDR 0.54 T (6.05%)
ST 012T4 (IDR 5.08 T)	Resilience/DRR	Flood control & coastal protection structures (51 km)	West Java, Central Java, North Kalimantan	IDR 1.29 T (25.36%)
ST 012T4 (IDR 5.08 T)	Sustainable Transport	Medan – Binjai airport railway (20.9 km)	North Sumatra	IDR 0.46 T (9.01%)
ST 012T4 (IDR 5.08 T)	Sustainable Water	Dam construction (6 dams); Irrigation network rehabilitation	South Sumatra, West – Central – East Java, Bali, Maluku, NTT	IDR 3.33 T (65.63%)
ST 013T4 (IDR 4.84 T)	Renewable Energy	Rooftop solar PV (Presidential Palaces, Volcano Obs. Posts); EV conversion workshop	Yogyakarta, Bali, South Sumatra, North Sulawesi, NTT	IDR 7.0 B (0.14%)
ST 013T4 (IDR 4.84 T)	Resilience/DRR	Flood & coastal protection; Groundwater network; BMKG climate observation upgrade	34 provinces (national)	IDR 1.94 T (40.14%)
ST 013T4 (IDR 4.84 T)	Sustainable Transport	Jakarta KRL (Manggarai – Jatinegara); Sumatra & Java railway lines; Makassar – Parepare	DKI Jakarta, Sumatra, Java, South Sulawesi	IDR 0.48 T (10.00%)
ST 013T4 (IDR 4.84 T)	Sustainable Water	Bulango Ulu Dam (84 M mä); Saddang	Gorontalo, South Sulawesi,	IDR 2.41 T (49.70%)

		Irrigation; Dew – harvesting tech; SPAM Jayapura	Central Java, Papua	
PBSG001 (IDR 8.95 T)	Resilience/DRR	Flood control (9 structures, 15.8 km); Groundwater network	Banten, DKI Jakarta, Yogyakarta, South Kalimantan, NTT	IDR 2.83 T (31.66%)
PBSG001 (IDR 8.95 T)	Sustainable Water	15 dams (193 M mä); Irrigation (1,487 ha); Jatiluhur SPAM (1.9 M beneficiaries)	Aceh, North Sumatra, West – Central Java, NTB, NTT, Gorontalo	IDR 5.87 T (65.58%)
PBSG001 (IDR 8.95 T)	Sustainable Transport	Makassar – Parepare (Baru Station access)	South Sulawesi	IDR 0.25 T (2.75%)

Source: DJPPR, *Green Sukuk Allocation and Impact Report 2025*

The FY2024 impact metrics reported on an ex – ante and actual basis in accordance with ICMA's Harmonised Framework for Impact Reporting (June 2024 edition) reveal significant aggregate environmental outputs across three primary dimensions. In the water sector, FY2024 projects contribute an estimated 632 million mä of enhanced water storage capacity and reduce flood – prone areas by approximately 5,245 hectares nationally. In the transport sector, actual annual GHG emission reductions reach 1,634,786 tCO₂e from currently operational railway lines, with an additional 2,091,219 tCO₂e in expected reductions pending operationalization of the Java double – track and East Java regional lines. In the energy sector, rooftop solar PV installations at five sites generate 325 MWh of clean electricity annually, achieving 276 tCO₂e in actual GHG reductions. It is important to note, consistent with the report's own interpretive guidance³⁵, that all metrics are ex – ante estimates based on project appraisal assumptions, and that behavioral changes or baseline shifts may cause deviations from projections, a limitation that reinforces the necessity of the normative evaluation layer this study contributes. Table 8 consolidates the key impact metrics by sector.

Table 8. Key Environmental Impact Metrics of FY2024 Green Sukuk Projects by Sector

Sector	Impact Metric	Reported Value (FY2024)	Sukuk Series
Sustainable Water & Wastewater Management	Water storage capacity added	≥ 249.46 M mä (SNI) + 105.57 M mä (ST012T4) + 84 M	All series

³⁵ DJPPR, 53.

		mä (Bulango Ulu) + 193.03 M mä (PBSG) = ~632 M mä cumulative FY2024	
Sustainable Water & Wastewater Management	Irrigation area rehabilitated	40,141 ha (ST 013T4) + 1,487 ha (PBSG) + 4,871 ha (ST 013T4 new) = ~46,499 ha	ST 013T4, PBSG
Sustainable Water & Wastewater Management	Clean water beneficiaries	~1.9 million people / 380,000 household connections (Jatiluhur SPAM, Jakarta Metro Area)	PBSG
Resilience/DRR	Flood – prone areas reduced	360.19 ha (SNI) + 1,783.5 ha (ST012T4) + 404.8 ha (ST013T4) + 2,697 ha (PBSG) = ~5,245 ha	All series
Resilience/DRR	Raw water capacity enhanced	10.07 km (SNI) + 68.8 km networks, 57 wells (ST013T4) + 68.77 km, 34 wells (PBSG) = 4.0246 mä/s service capacity	SNI, ST 013T4, PBSG
Sustainable Transport	Actual GHG reduction	1,634,786 tCO ₂ e/year (actual): KRL Jakarta 510,064 + Sumatra passenger 90,864 + Sumatra freight 1,033,087 + Makassar – Parepare 771	ST 013T4, PBSG
Sustainable Transport	Expected GHG reduction	2,091,219 tCO ₂ e/year (expected): Java passenger double – track 1,016,097 + Java freight 1,033,087 + East Java regional 42,035	ST 013T4
Sustainable Transport	Airport railway GHG reduction	1,464 tCO ₂ e/year (Medan – Binjai airport railway, actual)	ST 012T4
Renewable Energy	Actual GHG reduction	276 tCO ₂ e/year; electricity generated: 325 MWh/year (rooftop solar PV, 5 installations)	ST 013T4

Source: DJPPR, Green Sukuk Allocation and Impact Report 2025. GHG = greenhouse gas; DRR = disaster risk reduction; NTT = East Nusa Tenggara; SPAM = regional water supply system.

Fiqh Al-Bī'ah Evaluation of Green Sukuk Projects

Applying the three-dimensional analytical framework and five-step evaluation procedure, this study evaluates fifteen project groupings drawn from the FY2024 green sukuk portfolio documented in DJPPR 2025. The projects extracted from Tables 1–5 of the official report and consolidated by type and sector span all five sukuk series (SNI 0754, ST 012T4, ST 013T4, and PBSG001) and represent the full range of eligible sectors. Each project group is assessed along the dimensions of environmental impact (High/Medium/Low), ecological risk (High/Medium/Low, where lower risk indicates greater *fiqh al-bī'ah* conformity), and public benefit (High/Medium/Low), and assigned to one of the four conformity categories in the typology model. Table 9 presents the complete evaluation matrix.

Table 9. Fiqh al-Bī'ah Evaluation Matrix: FY2024 Indonesia Green Sukuk Projects

No	Sector	Project (FY2024)	Env. Impact	Eco. Risk	Pub. Benefit	Typology	Key Fiqh Principle
A. SUSTAINABLE WATER AND WASTEWATER MANAGEMENT							
A1	Sustainable Water	Dam construction & revitalization: 11 dams, 1 lake (SNI 0754); 6 dams (ST 012T4); Bulango Ulu Dam 84M mā (ST 013T4); 15 dams 193M mā (PBSG) → cumulative ~632M mā FY2024	H	L	H	Direct Ecological Conformity	<i>Ḥifẓ al-bī'ah; Man' al-israf; Maṣlaḥah 'ammah</i>
A2	Sustainable Water	Irrigation network rehabilitation, 252.6 km networks, 4 weirs, 40,141 ha (ST 013T4); 1,487 ha irrigation (PBSG); Rias irrigation 3 km (ST 012T4); Saddang 4,871 ha (ST 013T4)	H	L	H	Direct Ecological Conformity	<i>Man' al-israf; Maṣlaḥah 'ammah; Ḥifẓ al-mal</i>

No	Sector	Project (FY2024)	Env. Impact	Eco. Risk	Pub. Benefit	Typology	Key Fiqh Principle
A3	Sustainable Water	Jatiluhur I SPAM expansion, 4,750 L/s raw water supply, 1.9M beneficiaries, 380,000 household connections, Jakarta Metropolitan Area (PBSG)	H	L	H	Direct Ecological Conformity	<i>Maşlahah 'ammah; Ḥifẓ al-nafs; La ḍarar</i>
A4	Sustainable Water	Groundwater & raw water network, drought areas (Aceh, NTT, West Papua / SNI); nationwide raw water 4.0246 mā/s, 68.8 km, 57 wells (ST 013T4); 68.77 km, 34 wells (PBSG)	H	L	H	Direct Ecological Conformity	<i>La ḍarar; Maşlahah 'ammah; Ḥifẓ al-nafs</i>
A5	Sustainable Water	Dew – harvesting & purification technology, 300 – 350 L/day, Central Java campus (proof – of – concept); SPAM apartment Jayapura, Papua (ST 013T4)	M	L	M	Direct Ecological Conformity	<i>Man' al-israf; Ḥifẓ al-bī'ah, avoids groundwater exploitation</i>
B. RESILIENCE TO CLIMATE CHANGE / DISASTER RISK REDUCTION							
B1	Resilience / DRR	Flood control & coastal protection, nationwide: 5 structures (SNI, 360.19 ha); 4 structures 51 km (ST 012T4, 1,783.5 ha); 25.34 km (ST	H	M	H	Direct Ecological Conformity	<i>La ḍarar; Man' al- fasad; Maşlahah 'ammah</i>

No	Sector	Project (FY2024)	Env. Impact	Eco. Risk	Pub. Benefit	Typology	Key Fiqh Principle
		013T4, 404.8 ha); 9 structures (PBSG, 2,697 ha) → total ~5,245 ha					
B2	Resilience / DRR	Flood control IKN Nusantara, Sanggai 1A & Pamaluan River, East Kalimantan; 360.19 ha flood area reduced; in ecological buffer zone with high biodiversity (SNI 0754, IDR 443.5B)	H	M	H	Conditional Conformity	<i>La ḍarar; Man' al-fasad, construction in ecological buffer zone; benefit conditioned on mitigation of ecosystem disturbance</i>
B3	Resilience / DRR	BMKG climate observation upgrade, GAW stations (surface ozone, black carbon, SO ₂ , NO _x , PM _{2.5} /PM ₁₀), automatic weather stations, high – performance computing; 5 provinces (ST 013T4, IDR 7.5B)	M	L	H	Indirect Conformity	<i>Maṣlaḥah 'ammah; Ḥifẓ al-nafs, enabling evidence-based climate governance; no direct ecological restoration</i>
C. SUSTAINABLE TRANSPORT							
C1	Sustainable Transport	Jakarta Metropolitan Electric Rail (KRL), Manggarai – Jatinegara enhancement; 510,064 tCO ₂ e/year actual GHG reduction; modal shift from private	H	L	H	Direct Ecological Conformity	<i>Man' al-fasad; Man' al-israf; Maṣlaḥah 'ammah, largest actual GHG reducer in portfolio</i>

No	Sector	Project (FY2024)	Env. Impact	Eco. Risk	Pub. Benefit	Typology	Key Fiqh Principle
		vehicles (ST 013T4, IDR 249.1B)					
C2	Sustainable Transport	Medan – Binjai airport railway (20.9 km extension), 1,464 tCO ₂ e/year actual; 56 trips/day; reduces Medan – Binjai road congestion (ST 012T4, IDR 457.6B)	H	L	H	Direct Ecological Conformity	<i>Man' al-fasad; Ḥifz al-bī'ah; Maṣlaḥah 'ammah</i>
C3	Sustainable Transport	Sumatra passenger & freight railway, Lhokseumawe – Bireuen; North Sumatra – Aceh land acquisition; 90,864 tCO ₂ e passenger + 1,033,087 tCO ₂ e freight actual GHG reduction (ST 013T4)	H	L	H	Direct Ecological Conformity	<i>Man' al-fasad; Man' al-israf, freight modal shift from trucks is highest-volume GHG reducer</i>
C4	Sustainable Transport	Java railway RKL/RPL environmental planning, Semarang Tawang – Tanjung Emas; Sepanjang – Mojokerto double track; Surabaya Regional Railway (not yet operational); 1,016,097 + 1,033,087 tCO ₂ e expected (ST 013T4, IDR 1.9B)	M	L	M	Indirect Conformity	<i>Maṣlaḥah 'ammah, environmental planning only; GHG benefit expected but not yet realized</i>

No	Sector	Project (FY2024)	Env. Impact	Eco. Risk	Pub. Benefit	Typology	Key Fiqh Principle
C5	Sustainable Transport	Makassar – Parepare supporting infrastructure, Barru Station access road & street lighting (PBSG, IDR 245.8B); Maros depot landscaping & lighting (ST 013T4, IDR 1.7B); 771 tCO ₂ e/year actual	L	L	M	Indirect Conformity	<i>Maṣlaḥah 'ammah, station access infrastructure; direct ecological contribution is minimal; benefit is enabling/logistical</i>
D. RENEWABLE ENERGY							
D1	Renewable Energy	Rooftop solar PV, Yogyakarta Palace (100 kWp), Bali Tampaksiring Palace (100 kWp), 3 Volcano Obs. Posts (6 kWp each); 325 MWh/year; 276 tCO ₂ e/year actual; EV conversion workshop Jakarta (ST 013T4, IDR 7B)	M	L	M	Direct Ecological Conformity	<i>Ḥifẓ al-bī'ah; Man' al-israf; Man' al-fasad, clean energy production with no land disturbance</i>
E. GREEN BUILDINGS							
E1	Green Buildings	Jambi High Prosecutor's Office, 3 – story, 44 units (ST 013T4, IDR 1.05B); UGM civil servant housing, 6 – floor, 88 units, solar panels, bicycle areas, green spaces (PBSG, IDR 1.07B); GHG	L	L	M	Indirect Conformity	<i>Maṣlaḥah 'ammah; Ḥifẓ al-nafs, primary function is decent housing; ecological contribution through green features is secondary and unquantified</i>

No	Sector	Project (FY2024)	Env. Impact	Eco. Risk	Pub. Benefit	Typology	Key Fiqh Principle
		pending calculation					

Source: Authors' evaluation based on DJPPR (2025). Env. Impact = Environmental Impact (H=High, M=Medium, L=Low); Eco. Risk = Ecological Risk (H=High risk [unfavorable], L=Low risk [favorable]); Pub. Benefit = Public Benefit. Typology: Direct (green) = Full conformity; Indirect (blue) = Mediated conformity; Conditional (yellow) = Context-dependent; Problematic (red) = Significant tension.

The Sustainable Water sector constitutes 43.25 percent of the cumulative green sukuk portfolio and encompasses dam construction, irrigation rehabilitation, drinking water expansion, groundwater network development, and innovative water technology. All five project groups in this sector receive a Direct Ecological Conformity classification, the strongest normative standing in the typology. Dam construction projects (A1): cumulatively add approximately 632 million m³ of water storage capacity across 47 dam and lake infrastructure units in FY2024³⁶, directly fulfilling the *ḥifẓ al-bī'ah* mandate of preserving water as a foundational natural resource, the *man' al-israf* principle of efficient resource management, and the *maṣlaḥah 'ammah* objective of food and water security. Irrigation rehabilitation (A2): covering 46,499 hectares of agricultural land strengthens national food systems while maintaining water cycle integrity, satisfying the classical criterion of *ḥifẓ al-māl* in its agricultural dimension.³⁷ The Jatiluhur SPAM expansion (A3): extending clean drinking water to 1.9 million beneficiaries across the Jakarta Metropolitan Area, constitutes one of the most unambiguous realizations of *maṣlaḥah 'ammah* in the entire portfolio, fulfilling the *ḥifẓ al-naḥs* objective through access to safe water. The dew – harvesting technology pilot (A5) is notable for its explicit alignment with the *man' al-israf* principle: the system deliberately avoids groundwater exploitation, a form of resource excess expressly prohibited in *fiqh al-bī'ah*, while providing an innovative and replicable clean water solution.³⁸

The Resilience and DRR sector presents the most analytically differentiated results, with evaluations spanning three typology categories. Nationwide flood control and coastal protection projects (B1): reducing flood – prone areas by a cumulative 5,245 hectares through 18 structures across 12 provinces³⁹ receive Direct Ecological Conformity classification. These projects directly operationalize the *la ḍarar* principle by removing the threat of flood harm from vulnerable communities, embody *man' al-fasad fī al-arḍ* by preventing the destruction of agricultural land and human settlements, and fulfill *maṣlaḥah 'ammah* at a large scale. The IKN Nusantara flood control project (B2): however, merits Conditional Conformity classification. While the flood protection benefit is genuine, reducing flood – prone areas by 360.19 hectares in the Sanggai River Basin and 39.19 hectares along the Pamaluan River, the project operates within an ecologically sensitive buffer zone in East Kalimantan with documented biodiversity significance.

³⁶ DJPPR, "Green Sukuk Allocation and Impact Report 2025."

³⁷ Abdul Majid Umar Al – Najar, *Qodhoya Al-Biah Min Mandzhur Islami*, cet – 2 (Doha: Dar al – Kutub al – Qatariyah, 2004).

³⁸ DJPPR, "Green Sukuk Allocation and Impact Report 2025."

³⁹ DJPPR.

Construction – phase ecological disturbances (sedimentation, land clearing, hydrological alteration) constitute potential *ḍarar* and *fasad* that must be actively mitigated through the nature – based engineering safeguards referenced in the project description. Normative conformity is therefore conditional on implementation quality, not inherent in project design. The BMKG climate observation upgrade (B3) receives Indirect Conformity classification: its contribution to *maṣlaḥah 'ammah* through enhanced disaster preparedness and climate early warning is real and significant, but its mode of environmental contribution is entirely instrumental, the project improves the informational infrastructure for environmental governance without itself generating direct ecological improvement.

The Sustainable Transport sector reveals a normatively significant internal gradient that aggregate – level analysis would obscure. Railway projects with operational status the Jakarta KRL (C1), Medan – Binjai airport railway (C2), and Sumatra passenger/freight railway (C3) receive Direct Ecological Conformity classification on the strength of their documented actual GHG reduction data: 510,064 tCO₂e/year (KRL Jakarta), 1,464 tCO₂e/year (Medan – Binjai), and 90,864 + 1,033,087 tCO₂e/year (Sumatra), collectively totalling 1,634,786 tCO₂e of actual annual reductions⁴⁰. These figures represent the most direct and measurable realization of *man' al-fasad fī al-arḍ* in the entire portfolio preventing atmospheric degradation through modal shift from fossil – fuel transport. The Sumatra freight railway (C3) is particularly noteworthy: the modal shift of freight from diesel trucks to diesel trains achieves the highest single GHG reduction figure (1,033,087 tCO₂e), operationalizing *man' al-israf* at a systemic scale by eliminating wasteful fuel consumption across road freight networks. By contrast, the Java railway RKL/RPL environmental planning projects (C4) and the Makassar – Parepare supporting infrastructure (C5) receive Indirect Conformity classification. The Java projects contribute expected but not yet realized GHG benefits (1,016,097 + 1,033,087 tCO₂e) from railways still under construction; the Makassar – Parepare road access and depot landscaping serve logistical and aesthetic functions with minimal direct ecological contribution, though they remain justifiable under *maṣlaḥah 'ammah* as system – enabling infrastructure.

The Renewable Energy projects (D1) comprising rooftop solar PV installations at five sites generating 325 MWh of clean electricity and 276 tCO₂e of actual GHG reductions annually receive Direct Ecological Conformity classification. These installations fully satisfy *ḥifẓ al-bī'ah*, *man' al-israf*, and *man' al-fasad* through clean energy production without land disturbance or ecological risk, while the integration of solar PV at Volcano Observation Posts enhances disaster risk reduction capacity, a dual environmental and social benefit consistent with *maṣlaḥah 'ammah*. The Green Buildings projects (E1): the Jambi High Prosecutor's Office and UGM civil servant housing are classified as Indirect Conformity. Both buildings incorporate environmentally positive features (solar panels, green spaces, energy – efficient systems at UGM; compliance with green building standards at Jambi). However, their primary function is residential provision an objective squarely within *ḥifẓ al-nafs* and *maṣlaḥah 'ammah* but not directly constitutive of *ḥifẓ al-bī'ah*. The GHG contribution of both buildings remains uncalculated in DJPPR 2025, which itself signals the limits of their ecological conformity under the *man' al-fasad* criterion, environmental benefit is asserted but not yet substantiated.

⁴⁰ DJPPR.

The evaluation generates three principal findings. First, the FY2024 green sukuk portfolio demonstrates a strong but differentiated normative profile: 10 of 15 project groups (66.7 percent) achieve Direct Ecological Conformity, reflecting genuine alignment between funded activities and *fiqh al-bī'ah* principles. This is primarily driven by the dominant weight of the Sustainable Water sector (43.25 percent of cumulative proceeds) and the operationally active railway projects, which together generate the most substantive and measurable ecological outcomes. Second, the Indirect Conformity category (26.7 percent) reveals a structural characteristic of sovereign green sukuk portfolios: enabling infrastructure (monitoring systems, environmental planning, station access) is systematically included alongside directly ecological projects. While justifiable under *maṣlaḥah 'ammah*, this inclusion pattern risks diluting the normative ecological integrity of the portfolio if Indirect projects increase in proportion relative to Direct projects over successive issuances a concern directly relevant to discussions of greenwashing in Islamic sustainable finance.⁴¹ Third, the single Conditional classification (IKN flood control, 6.7 percent) signals an underappreciated tension: climate adaptation infrastructure located in ecologically sensitive zones may simultaneously fulfill *la ḍarar* toward human communities while generating *ḍarar* toward non-human ecosystems, a *ta'arūḍ al-maṣaliḥ* (conflict of interests) that classical *fiqh al-bī'ah* resolves through the principle of prioritizing the removal of the greater harm (*al-ḍarar al-ashadd*) and the imposition of active mitigation obligations.

DISCUSSION

The evaluation results reveal a systematic divergence between technical green eligibility and normative *fiqh al-bī'ah* conformity in a structurally identifiable subset of the FY2024 portfolio. This divergence is not incidental, it reflects what this study terms normative displacement: the tendency for international green standards (ICMA Green Bond Principles, Climate Budget Tagging, SDG alignment) to function as the primary and effectively sole certification layer, displacing the Islamic normative evaluation that the "sukuk" designation implies. Four cases exhibit this tension most sharply. The IKN Nusantara flood control project (B2) satisfies international green eligibility as a Resilience/DRR project yet carries elevated ecological risk from construction within East Kalimantan's biodiversity-sensitive buffer zone, where sedimentation, land clearing, and hydrological alteration constitute potential *ḍarar* and *fasad* under *fiqh al-bī'ah*. The Java railway RKL/RPL planning projects (C4) report 2,049,184 tCO₂e of expected GHG reductions, yet the railways remain non-operational and the sukuk proceeds finance environmental planning documentation rather than operational ecological benefit, making the environmental claim prospective in a sense that *man' al-fasad*, which requires a direct causal link between funded action and ecological outcome, cannot yet certify. The Makassar-Parepare supporting infrastructure (C5) claims GHG credit through line-level attribution of 771 tCO₂e from an access road and depot landscaping investment, an attribution chain technically defensible under ICMA methodology but normatively tenuous when the direct ecological contribution of the funded activity is logistical. Finally, the green buildings (E1) present unquantified GHG impacts at the time of reporting, asserting green status on the basis of design features without demonstrated ecological

⁴¹ Pirgaip and Arslan-Ayaydin, "Exploring the Greenium in the Green Sukuk Universe: Evidence from the Primary Market."

performance, a condition that *ḥifẓ al-bī'ah*, which obliges active environmental stewardship rather than passive compliance, cannot accept as sufficient.

The Greenwashing Lens: Label, Substance, and Islamic Accountability

Greenwashing, the misrepresentation of environmental performance through selective disclosure, unsubstantiated claims, or strategic framing, has been identified as a structural risk in the global green bond market.⁴² In the Islamic sustainable finance context, this risk carries an additional normative dimension: a green sukuk that misrepresents its ecological substance not only violates investor trust but constitutes a form of *ghish* (deception) prohibited under Islamic commercial law. While Indonesia's FY2024 portfolio does not exhibit systematic greenwashing, three structural vulnerabilities are identifiable from this study's evaluation. First, the inclusion of projects with unquantified GHG contributions (E1) and expected-only GHG reductions (C4) in an officially reported impact document creates an implicit claim of environmental performance that is not yet substantiated, a condition that Noor Baity and Poetri⁴³ characterize as "prospective greenwashing" in their analysis of Indonesian green sukuk disclosure. Second, the line-level GHG attribution methodology for transport projects creates a systemic attribution gap between the funded activity and the reported environmental outcome that is invisible within the ICMA reporting framework but directly problematic under *man' al-fasad*. Third, and most structurally significant: the absence of *fiqh al-bī'ah* screening in the KRISNA project selection system (Pillar 2 of the SDGs Government Securities Framework) means that a project generating significant ecological harm below the technical quantification threshold would pass all four governance pillars of the green sukuk framework without normative review, a gap that renders the "sukuk" certification structurally incomplete as a claim of Islamic environmental governance.⁴⁴

Fiqh al-Bī'ah vs. *Maqāṣid*: Navigating Conflicts of Ecological and Social Interest

The IKN flood control case crystallizes the most theoretically significant normative tension in the portfolio: a conflict between *la ḍarar* owed to human communities threatened by flooding and *la ḍarar* owed to the non-human ecosystem disturbed by construction in a biodiversity buffer zone. Classical *fiqh al-bī'ah* resolves such *ta'aruf al-maṣalih* (conflicts of competing interests) through two jurisprudential principles. The first, *al-ḍarar al-ashadd yuzal*, the greater harm is removed first. Favors flood protection in this case, given the documented risk to 30,000–40,000 residents and the irreversible consequences of repeated inundation on human life, property, and food security. The second, *al-mashaqqah tajlib al-taysīr*, hardship invites facilitation. Permits ecological disruption under genuine community necessity (*ḍarūrah*) subject to an affirmative obligation of active mitigation. The jurisprudential outcome is therefore not prohibition but conditional permission: the IKN project is *ja'iz* (permissible) under *fiqh al-bī'ah* provided that the nature-based engineering safeguards stipulated in the project description are implemented as described.⁴⁵ This finding has broader methodological implications: it demonstrates that *fiqh al-bī'ah* evaluation does not produce binary

⁴² Pirgaip and Arslan – Ayaydin.

⁴³ Baity and Poetri, "Ensuring the Credibility and Sharia Compliance of Sovereign Green Sukuk to Achieve Net Zero Emissions in Indonesia."

⁴⁴ DJPPR, "Green Sukuk Allocation and Impact Report 2025"; Magfiroh and Risnaeni, "Greenwashing in Sukuk Fund Allocation on the IDX: Analysis with Three Sharia ESG Discrepancy Indicators."

⁴⁵ DJPPR, "Green Sukuk Allocation and Impact Report 2025."

halal/haram verdicts but graduated normative guidance along the spectrum of *aḥkam al-taklīfiyyah*, precisely the kind of contextually sensitive environmental governance framework that climate—adaptation infrastructure in ecologically complex regions demands.⁴⁶

Theoretical Implications: *Fiqh al-Bī'ah* as a Distinct Islamic Environmental Paradigm

The tensions and findings documented in Sections 6.1–6.3 sustain a broader theoretical claim: *fiqh al-bī'ah* is not merely a complementary ethical commentary on conventional green finance standards, it constitutes a substantively distinct normative paradigm with different evaluative priorities, different accountability mechanisms, and a different theory of what makes environmental finance legitimate. Where international green standards prioritize measurable environmental outcomes (GHG reduction, water storage volume, flood area mitigation), *fiqh al-bī'ah* prioritizes normative ecological relationships: the prohibition of harm, the prohibition of waste, the obligation of active stewardship, and the distributive requirement that benefits reach the public. This distinction matters practically: a project can score well on outcome metrics (high GHG reduction, large water storage) while generating *ḍarar* in the construction phase, or can achieve nominal green eligibility without demonstrating any of the three substantive dimensions (environmental impact, ecological risk management, or public benefit distribution) that *fiqh al-bī'ah* requires. This study therefore contributes to the emerging theoretical debate, evident in Auda (2019), Zahari (2025), and Magfiroh & Risnaeni (2026) about whether Islamic finance can generate a genuinely Islamic theory of sustainable investment, rather than simply adapting secular sustainability frameworks to Sharia—compliant contract structures. The answer this study advances is affirmative: *fiqh al-bī'ah*, a normative architecture for Islamic ESG that is both jurisprudentially grounded and empirically applicable.

Practical Implications for Sharia Governance and Policy

Three actionable governance recommendations arise from the evaluation findings, each directed at a different institutional actor in the green sukuk ecosystem. For Sharia supervisory boards (DPS/SSB), the central recommendation is a mandatory expansion of the DPS certification mandate to include *fiqh al-bī'ah* screening at the project level: DPS review should assess whether proposed projects generate *ḍarar* or *fasad* against the five core principles elaborated in Section 2.3, rather than limiting Sharia review to the contractual and structural dimensions of the sukuk instrument. This is consistent with the spirit of AAOIFI Sharia Standard No. 17 on investment sukuk and would represent the most substantive integration of Islamic environmental law into Islamic sustainable finance certification achieved to date. For the government as issuer (Ministry of Finance/DJPPR), the study recommends integrating a *fiqh al-bī'ah* conformity tier into Pillar 2 (Project Evaluation and Selection) of the SDGs Government Securities Framework, operationalizing it through an ecological risk screening step within the existing CBT mechanism, and requiring quantified ecological impact data at project completion rather than projections at project appraisal alone. The Government of Indonesia's recent Framework 2025 update cycle presents a direct and timely window for this integration. For the Islamic sustainable finance governance ecosystem more broadly, the study

⁴⁶ Khuluq and Asmuni, "Hifz Al – Bi'ah as Part of Maqashid Al – Shari'ah and Its Relevance in the Context of Global Climate Change."

recommends developing an Islamic Environmental Governance Standard that places *fiqh al-bī'ah* indicators (*ḥifẓ al-bī'ah*, *la ḍarar*, *man' al-fasad*, *man' al-israf*, and *maṣlaḥah 'ammah*) as a mandatory normative layer alongside conventional ESG metrics (MSCI, GRI, SASB), rather than treating Islamic ESG as a filtered version of secular sustainability standards. Indonesia's sovereign green sukuk program is the most appropriate and data – rich testing ground for piloting such a standard.⁴⁷

CONCLUSION

This study set out to address four research questions concerning the conceptualization, operationalization, application, and implications of *fiqh al-bī'ah* as an evaluative framework for Indonesia's sovereign green sukuk. The study demonstrates that *fiqh al-bī'ah* can be conceptually grounded within *maqāṣid al-Sharī'ah* as an applied extension of the classical five objectives, with *ḥifẓ al-bī'ah* positioned as a functional precondition for *ḥifẓ al-nafs*, *ḥifẓ al-nasl*, and *ḥifẓ al-mal* under contemporary climate conditions, not a peripheral addendum but an integral structural element of the *maqāṣid* hierarchy. A three – dimensional analytical framework comprising fifteen indicators derived from five core *fiqh al-bī'ah* principles was constructed, each grounded in classical and contemporary Arabic – language jurisprudential sources and operationally linked to data available in official impact reports. The evaluation of fifteen FY2024 project groups found that 66.7 percent achieve Direct Ecological Conformity, 26.7 percent Indirect Conformity, and 6.7 percent Conditional Conformity, with no project receiving a Problematic classification, confirming the overall normative integrity of the portfolio while identifying specific tensions in IKN construction – phase ecological risk, railway planning documents, transport supporting infrastructure, and unquantified green building claims. Three structural tensions were identified (normative displacement, prospective greenwashing vulnerability, and *ta'aruf al-maṣaliḥ* in ecologically sensitive adaptation projects) and translated into governance recommendations for Sharia supervisory boards, the government as issuer, and the Islamic sustainable finance ecosystem.

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⁴⁷ Pirgaip and Arslan – Ayaydin, "Exploring the Greenium in the Green Sukuk Universe: Evidence from the Primary Market."

DECLARATIONS

AUTHOR CONTRIBUTION STATEMENT

Authors 1 and 2 contributed to the study's conceptualization and design through collaborative development of the theoretical framework. Both authors conducted substantive research on green sukuk instruments and contemporary data sources, performed critical analysis of the Islamic jurisprudence framework governing green sukuk projects, and jointly led the drafting and compilation of the original manuscript. Author 3 contributed to the substantive and critical revision of the manuscript through comprehensive review and editing, validation of interpretive conclusions via cross-referential verification, and provision of critical input regarding the application and coherence of the evaluative framework for green sukuk projects. All authors reviewed and approved the final version of the manuscript and take full responsibility for its intellectual content and accuracy.

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The authors declare no competing financial or non-financial interests that could have affected the findings presented in this paper.

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The authors acknowledge the use of two AI tools during the development of this manuscript: Claude (Anthropic), which was used to support the translation process, and GPT, which was used for language enhancement purposes. The application of these tools was strictly limited to improving the linguistic quality of the text and did not extend to the generation of ideas, arguments, or scientific content. The authors have independently reviewed, revised, and verified the entire manuscript prior to submission and hereby attest to its accuracy and originality. Therefore, full and absolute responsibility for the intellectual substance, analytical claims, and any errors contained in this work rests with the authors.

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REFERENCES

Adhi Purba, Ilyas, and Binti Mutafarida. "Eksistensi Green Sukuk di Indonesia: Analisis terhadap Fiqih Lingkungan KH. Ali Yafie." *Jurnal Adz-Dzahab: Jurnal Ekonomi dan Bisnis Islam* 8, no. 2 (2023): 167–79. <https://doi.org/10.47435/adz-dzahab.v8i2.1687>.

- Ajmal, Muhammad, Sadheer (Mufti Muhammad Hassan) Khan, and Awais Ud Din Khan. "A Thematic Study of the Hadith 'La Darar Wa La Dirar' Regarding Environmental Balance." *Journal of Religion and Society* 4, no. 1 (September 2025): 770–76. <https://doi.org/10.5281/zenodo.17102163>.
- Al – Azhari, Abu Mansur. *Tahdhibul Lughoh*. Vol. 2. Riyadh: Darul Kitab al – Arabi, 1967.
- Al – Juhni, Ahmad bin Muhammad 'Ayid ar – Rifai. "Madhohirul Muhafadhoh 'alal Biah Fi al – Fiqh al – Islami." In *Majallah Az-Zahra*, vol. 2. Al – Mutamar al – Ilmi al – Duali al – Khamis, 2024.
- Al – Khin, Musthofa, Musthofa Al – Bugho, and A'li Al – Sariji. *Al-Fiqhul Manhaji Ala Madzhabil Imam Syafii*. Damaskus: Dar al – Qolam li al – Thoba'ah wa al – Nasyr, 1992.
- Al – Misri, Abi Fadhl. *Lisanul 'Arab*. Vol. 1. Beirut: Daar Shoodir, n.d.
- Al – Najar, Abdul Majid Umar. *Qodhoya al-Biah min Mandzhur Islami*. 2nd ed. Doha: Dar al – Kutub al – Qatariyah, 2004.
- Al – Raysuni, Ahmad. *Imam Al-Shatibi's Theory of the Higher Objectives and Intents of Islamic Law*. London: The International Institute of Islamic Thought, 2011.
- Alfirman, Luki. "How ESG Factors Are Impacting Retail Debt Programs: Indonesia Experience on Issuing Retail Green Sukuk." Jakarta, 2022. <https://thedocs.worldbank.org/en/doc/e0bd4e664be1e51804f9d84979d2102f-0430012022/related/IRDMC-2022-session-1-Indonesia.pdf>.
- As – Sahibani, Abdullah bin Umar. *Ahkamul Biah Fii Fiqhil Islami*. Riyadh: Dar Ibnul Jauzi, 2008.
- As – Syairazi, Imam Sayyid Muhammadd al – Husaii. *Al-Fiqhu al-Biah*. Beirut: Muassasah al – Wa'yu al – Islami, 2000.
- At – Thoyyar, Abdullah bin Muhammad, Abdullah bin Muhammad Al – Muthallaq, and Muhammad bin Ibrahim Al – Musa. *Al-Fiqh Muyassar*. 2nd ed. Riyadh: Madaar al – Wathon li al – Nasyr, 2012.
- Auda, Jasser. *Maqasid Al-Shariah as Philosophy of Islamic Law: A Systems Approach*. Virginia: International Institute of Islamic Thought, 2008.
- Baity, Sheila Noor, and Titie Rachmiati Poetri. "Ensuring the Credibility and Sharia Compliance of Sovereign Green Sukuk to Achieve Net Zero Emissions in Indonesia." *SERAMBI: Jurnal Ekonomi Manajemen dan Bisnis Islam* 7, no. 3 (August 20, 2025): 315–34. <https://doi.org/10.36407/serambi.v7i3.1683>.
- Bowen, Glenn A. "Document Analysis as a Qualitative Research Method." *Qualitative Research Journal* 9, no. 2 (August 3, 2009): 27–40. <https://doi.org/10.3316/QRJ0902027>.
- DJPPR. *Green Sukuk Allocation and Impact Report 2025*. Jakarta, 2025.
- Jalili, Ismail, Iwan Sitorus, Nenan Julir, Muhammad Shulthoni, Fadillah Ulfa, and Abdul Kabir Solihu. "Role of Qawa'id Fiqhiyyah in Promoting Green Investment within Islamic Economics: Theoretical and Practical Frameworks." *Journal of Islamic Thought and Civilization* 15, no. 1 (April 25, 2025): 202–23. <https://doi.org/10.32350/jitc.151.12>.

- Kadi, Sanaa. "Research Methods for Islamic Banking and Finance Law: Interdisciplinary Research Method." *European Journal of Islamic Finance* 9, no. 2 (2022): 1–8. <https://doi.org/10.13135/2421-2172/6628>.
- Kamil, Wan Abdul Rahim, Syed Azhan Syed Mohd Bakhor, Jose De Luna – Martinez, Wei Zhang, and Ahmad Hafiz Abdul Aziz. *Islamic Green Finance: Development, Ecosystem and Prospects*. Kuala Lumpur, 2019.
- Khairunnisa, Delta, Suhel, and Imam Asngari. "Integrating ESG and Maqashid Syariah for Sustainable Islamic Finance in Indonesia." *JIMKES* 13, no. 6 (2025): 4525–38. <https://doi.org/10.37641/jimkes.v13i6.4025>.
- Khuluq, M. Khusnul, and Asmuni Asmuni. "Hifz al – Bi'ah as Part of Maqashid al – Shari'ah and Its Relevance in the Context of Global Climate Change." *Indonesian Journal of Interdisciplinary Islamic Studies (IJIIS)* 7, no. 2 (2025). <https://doi.org/10.20885/ijiis.vol7.iss2.art3>.
- Lee, Eunkyoun, Jee Young Kim, and Yoon Lee. "A Comparative Analysis of Green Sukuk and Green Bonds." *International Journal of Islamic and Middle Eastern Finance and Management*, 2025. <https://doi.org/10.1108/IMEFM-12-2024-0609>.
- Magfiroh, Sayyidetul, and Umi Suwati Risnaeni. "Greenwashing in Sukuk Fund Allocation on the IDX: Analysis with Three Sharia ESG Discrepancy Indicators." *Dinasti International Journal of Economics, Finance & Accounting* 7, no. 1 (2026): 517–26. <https://doi.org/10.38035/dijefa.v7i1.6457>.
- Muldoon, Clodagh, Caroline Harrison, and Deepak Sharma. *Sustainable Debt Global State of the Market 2024*. London, 2025.
- Naim, Amal Zainun, Yustafad, and Muhammad Fathur Reza. "Effectiveness of Green Sukuk in Indonesia: Emission Measurement, Sharia Law, and Transparency." *Jurnal At-Tamwil: Kajian Ekonomi Syariah* 8, no. 1 (2026): 14–33. <https://doi.org/10.33367/at-tamwil.v8i1.8173>.
- Nisak, Khoirun. "Cash Waqf Linked Blue Sukuk: An Analysis of Fiqh al – Biah." *Prosiding Konferensi Integrasi Interkoneksi Islam dan Sains ke-5* 5 (2023): 163–68.
- Pirgaip, Burak, and Ozgur Arslan – Ayaydin. "Exploring the Greenium in the Green Sukuk Universe: Evidence from the Primary Market." *International Journal of Islamic and Middle Eastern Finance and Management* 17, no. 3 (2024): 423–40. <https://doi.org/10.1108/IMEFM-05-2023-0186>.
- Prayogo, Syamsi Mustofa Singgih, Aji Raditya, and Adel Sarea. "A Bibliometric Analysis of Green Sukuk Literature." *Review of Islamic Social Finance and Entrepreneurship* (2024): 184–98. <https://doi.org/10.20885/RISFE.vol3.iss2.art6>.
- Salami, Monsurat Ayojimi, Mustapha Abubakar, and Harun Tanrivermiş. "The Best Methodology Recommended for Research in Islamic Finance." In *Teaching and Research Methods for Islamic Economics and Finance*, 1st ed., 14. Routledge, 2022.
- Taimiyah, Ahmad bin. *Majmu' Al-Fatawa*. Vol. 21. Riyadh: Dar 'Alam al – Kutub, 1985.

- Udzma, Linda Amala, and Mohammad Muqronul Faiz. "The Existence of Green Sukuk in Indonesia: An Analysis of Yūsuf al – Qaraḍawī's Environmental Fiqh." *Proceedings of ICCoLaSS: International Collaboration Conference on Law, Sharia and Society* (2024): 70 – 81.
- Ulfah, Indar Fauziah, Raditya Sukmana, Nisful Laila, and Sulaeman Sulaeman. "A Structured Literature Review on Green Sukuk (Islamic Bonds): Implications for Government Policy and Future Studies." *Journal of Islamic Accounting and Business Research* 15, no. 7 (2023): 1118 – 33. <https://doi.org/10.1108/JIABR-10-2022-0255>.
- Wan Zahari, Wan Mohd Zulhafiz. "Operationalising Green Sukuk within the World Bank Environmental and Social Framework." *Discover Environment* 3, no. 1 (2025): 288. <https://doi.org/10.1007/s44274-025-00490-6>.