



Green waqf crowdfunding model for SDGs: A *fiqh al-bi'ah* legal framework

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Abstract

Purpose – This study investigates the construction of an integrated green waqf crowdfunding model grounded in *fiqh al-bi'ah* (Islamic environmental jurisprudence) to accelerate the implementation of sustainable development goals (SDGs) in Indonesia.

Methodology – This study employs a descriptive-qualitative method with a normative-juridical approach. It utilizes *maqasid al-Sharia* and agency theory to systematically analyze secondary legal materials and extract ecological parameters (*hifz al-bi'ah*) from classical and contemporary *fiqh*.

Findings – This study's findings suggest that current Islamic social finance models exhibit a social-humanitarian bias and treat Sharia compliance merely as a formal contractual requirement, thereby risking greenwashing. To resolve this, the study proposes a novel tripartite model—collection, management, and distribution—that technically embeds *fiqh al-bi'ah* as a mandatory screening protocol to ensure substantive ecological justice.

Implications – This research is useful for improving the regulatory framework and governance of digital waqf platforms. Practically, it mitigates agency problems through blockchain-verified eco-impact reporting and recommends an inter-institutional joint ministerial decree (SKB) to establish a binding green waqf taxonomy.

Originality – This study contributes to the global discourse on Islamic social entrepreneurship by synthesizing environmental ethics with fintech architecture. It transforms *fiqh al-bi'ah* from a mere moral appeal into a verifiable operational algorithm.

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Introduction

Indonesia currently faces a complex duality in its national development agenda. On the one hand, the nation must pursue aggressive economic growth; on the other, it is bound by global commitments to the sustainable development goals (SDGs) and the net-zero emission 2060 target. Fulfilling this environmental agenda requires massive financing; however, the state budget (APBN) has significant limitations in closing the financing gap for climate and social projects (Faizi et al., 2024; Irfany et al., 2023). This exigency necessitates the presence of alternative financing instruments beyond the government sector (Muklis et al., 2025). One instrument possessing

substantial liquidity potential but remaining under optimized is Islamic social finance, particularly waqf (Hasan & Syahrudin, 2022).

The paradigm of waqf has transformed from managing static assets into productive assets, giving birth to the concept of green waqf as a theological response to the ecological crisis (Al Hanif et al., 2026; Listiana & Mutmainah, 2022; Zawawi et al., 2023). To overcome traditional obstacles regarding scalability and community participation (Sulistiani & Gumilar, 2025; Uyun & Hamida, 2024), the integration of financial technology (fintech) through Sharia crowdfunding schemes plays a vital role. Empirically, integrating technology into Islamic philanthropy democratizes access to social investment and accelerates the achievement of the SDGs (Fikri & Andrean, 2023; Ishom et al., 2025; Murtadha & Maulida, 2025).

Despite extensive discourse on crowdfunding and Green Waqf, existing research exhibits fundamental limitations. The current literature generally diverges into two groups. The first group highlights technical and behavioral aspects, concluding that platform ease of use and campaign narratives significantly influence donor participation (Dirie et al., 2024; Zain et al., 2019). The second group discusses financial structures, such as waqf-blended finance, to address liquidity issues in large-scale environmental projects (Lahuri & Lutfiah, 2024). However, a critical gap in these studies is the absence of a robust normative and legal framework governing environmental ethics (Alfarisi & Huda, 2023).

Currently, Sharia compliance in Islamic crowdfunding is confined to a procedural-contractual dimension. Most existing models focus merely on the formal validity of the contract (*aqd*), such as avoiding *riba* (*usury*) and uncertainty (*gharar*), while entirely neglecting substantive ecological impact assessments. Consequently, a project can be contractually labeled as *halal*, even if it inadvertently causes environmental degradation. Without specifically positioning environmental jurisprudence (*fiqh al-bi'ah*) as an operational legal filter, the "green waqf" label risks becoming mere marketing jargon. This normative vacuum exposes the digital philanthropic ecosystem to severe greenwashing practices under the guise of pseudo-Sharia compliance (Abduh et al., 2024; Almurni, 2024).

To bridge this critical normative vacuum, this study aims to construct a legally and technologically integrated green waqf crowdfunding model grounded in *fiqh al-bi'ah* to accelerate the SDGs in Indonesia. Diverging from previous studies that treat environmental ethics as voluntary corporate social responsibility (CSR), this research proposes a novel contractual engineering approach. The study introduces a tripartite architecture (collection, management, and distribution) that technically embeds a green clause using the right of cancellation (*kehijar*) instrument within smart contracts. This legal engineering definitively positions ecological preservation (*hifz al-bi'ah*) as a mandatory condition for contract validity (*syurut al-shibhab*).

Ultimately, this study significantly contributes to the global discourse on Islamic social entrepreneurship by synthesizing Sharia fintech architecture with global SDG standards and Islamic environmental law. This framework transforms *fiqh al-bi'ah* from a mere moral appeal into a strictly binding, justiciable norm. By doing so, the model effectively mitigates agency problems through blockchain-verified eco-impact reporting, unlocking the potential of waqf as patient capital for renewable energy and climate action, while providing a clear policy roadmap for macro-regulatory harmonization.

Literature Review

The theoretical lens: *Maqasid al-Sharia* and *fiqh al-bi'ah*

To provide a robust theoretical grounding, this study utilizes *maqasid al-Sharia* (objectives of Islamic law) as the primary analytical lens to interpret the normative framework of ecological preservation. In its development, the integration of *fiqh al-bi'ah* into the *maqasid al-Sharia* framework positions environmental preservation as a key prerequisite for the realization of public interest, or *al-maslahah* (Haris et al., 2024). The reinterpretation of the aspect of *al-daruriyyat al-khams* shows that nature conservation is a fundamental variable that supports preservation of life (*hifz al-nafs*) and preservation of offspring (*hifz al-nasl*), given that climate crises and pollution directly threaten human survival (Wahyudi et al., 2025). This has prompted experts to propose *hifz al-bi'ah* or *hifz al-*

'alam as the sixth *maqasid* (Subli et al., 2025). This conceptual transformation changes the status of environmental protection from a mere ethical recommendation to a fard (obligatory) sharia obligation, both in the individual and collective dimensions.

Within this *maqasid* framework, *fiqh al-bi'ah* emerged as a normative response that constructs environmental management ethics within the framework of *tawhid*, *khilafah*, and *mizan* (Banna & Rosyidah, 2025; Makraja & Ramlah, 2025). Conceptually, humans are positioned as stewards (*khilafah*) who carry a religious mandate to bring prosperity to the earth without causing damage (*fasad*) (Khuluq & Asmuni, 2024). Various studies emphasize that the principle of ecological balance (*mizan*) requires moderation in consumption and prohibits excessive exploitation of resources (*israf*) (Karimullah, 2024; Klongrua et al., 2025). In this discourse, environmental destruction is seen as a form of extreme spiritual disobedience or *kufr al-bi'ah* (Rois et al., 2024). Therefore, *fiqh al-bi'ah* provides a strong epistemological basis for evaluating and correcting economic policies and modern lifestyles to remain in harmony with the integrity of nature. The implementation of this normative framework has significant implications for Islamic economic activities, particularly in the instrument of waqf, ensuring that the circulation of wealth remains within the limits of the natural balance.

Green waqf as an instrument for social entrepreneurship and SDGs

Viewing it through the broader international discourse on social entrepreneurship, the paradigm shift in waqf from the management of traditional physical assets, such as mosques and cemeteries, to the utilization of productive assets has paved the way for the emergence of the green waqf concept. Conceptually, contemporary global literature affirms that green waqf functions as an innovative social financial instrument with a wide reach in supporting the global development agenda. Various studies emphasize that this instrument can contribute significantly to the sustainable development goals (SDGs) (Abduh et al., 2024). This shows that waqf is no longer seen merely as static religious philanthropy but as a driving force for sustainable and inclusive prosperity.

Within the regional context, particularly in Southeast Asia, the discourse on green waqf is specifically linked to strategic projects, such as renewable energy development and reforestation initiatives (Listiana & Mutmainah, 2022). This practice reflects a tangible effort to integrate spiritual values with ecosystem conservation in tropical regions. Furthermore, the integration of waqf into sustainable development is seen as a mechanism for democratizing environmental funding at the global level. By mobilizing community-based capital, green waqf reduces the environmental sector's dependence on limited state budgets while strengthening community sovereignty in independently managing natural resources.

Overcoming agency issues: Digital crowdfunding in Islamic social finance

Despite its great potential, a critical evaluation of current green waqf practices reveals fundamental challenges related to transparency and accountability of impact. Many projects using the green label still lack rigorous ecological audits that are in line with sharia principles (Alfarisi & Huda, 2023). From an agency theory perspective, this highlights a significant information asymmetry between donors (principals) and platform managers (agents). This phenomenon raises concerns that these initiatives often prioritize financial returns over the substantial environmental impact that should be the main objective.

Addressing the governance challenges inherent in traditional philanthropy, crowdfunding has emerged as a disruptive force in Islamic social finance by reducing transaction costs and enhancing transparency to mitigate agency issues. Studies by Alfarisi and Huda (2023) demonstrate that the adoption of digital waqf platforms is heavily influenced by perceived usefulness and trust. Furthermore, the concept of "waqf-blended finance," which combines social waqf funds with commercial capital, has been proposed as a solution to liquidity problems in large-scale environmental projects (Sudi, 2025). On a broader international scale, crowdfunding is recognized for its ability to target "impact investors" among the millennial generation, who prioritize social and ecological outcomes alongside Sharia compliance (Alam et al., 2023).

Despite its potential, the literature suggests a significant gap: most platforms focus on the collection phase but lack a robust management framework that incorporates specific environmental jurisprudence into their screening algorithms. While previous research has extensively discussed the technical aspects of crowdfunding (Zain et al., 2019) and the general potential of green waqf (Listiana & Mutmainah, 2022), there is a notable absence of an integrative model that explicitly uses *fiqh al-bi'ah* as an operational protocol. Most existing studies treat *Sharia* compliance as a formal contractual requirement (*aqd*) rather than a substantive ecological filter (*hifz al-bi'ah*). This research bridges that gap by synthesizing Islamic environmental law with digital finance architecture, ensuring that the green waqf model is not only technologically advanced but also theologically robust and ethically sound on a global scale.

Research Methods

Research design and approach

This normative legal research has a descriptive-analytical nature and focuses on the construction of legal and economic models. To strengthen the methodological rigor, this study adopts the doctrinal legal research framework (Marzuki, 2017), which systematically analyzes the interactions between legal concepts, positive regulations, and Islamic jurisprudential doctrines. The approaches used are the conceptual and statutory approaches. The conceptual approach is used to develop the Green Waqf framework by synthesizing classical and contemporary views of *fiqh al-bi'ah* (environmental jurisprudence), while the statute approach is used to examine waqf regulations, financial technology (fintech), and SDG standards in Indonesia.

Data acquisition and institutional sources

The data sources used are secondary data consisting of primary, secondary, and tertiary legal materials. To ensure the transparency and replicability of the data acquisition phase, the legal documents were systematically sourced from official and recognized institutional bodies in Indonesia:

Primary legal materials include the Qur'an and Hadith related to the environment, Law No. 41 of 2004 concerning waqf (issued by the Government of the Republic of Indonesia), POJK No. 77/POJK.01/2016 concerning Information Technology-Based Money Lending Services (issued by the Financial Services Authority/OJK), as well as specific fatwa documents and green waqf guidelines issued by the National Sharia Board-Indonesian Ulema Council (DSN-MUI) and the Indonesian Waqf Board (BWI).

Table 1. Thematic classification of secondary data sources (Literature)

Thematic cluster	Total sources	Key representative authors	Analytical purpose in the study
Islamic normative & theological Framework (<i>fiqh al-bi'ah</i>)	18	Haris et al. (2024); Fadel et al. (2025); Saputra et al. (2025)	To extract ethical parameters (<i>hifz al-bi'ah</i> , <i>la darar</i>) and formulate the legal justification for transforming <i>fiqh al-bi'ah</i> into a mandatory condition for contract validity (<i>syurut al-shibhal</i>).
Positive law & regulatory framework	16	Musthafa & Sariningsih (2024); Hafid et al. (2024); Aisyah et al. (2025)	To analyze the "vacuum of norm" in current regulations (waqf law, OJK), legitimize the <i>kebijaran</i> -based "green clause" under the ITE Law, and formulate the macro-policy roadmap (green waqf taxonomy).
Islamic social finance & SDGs integration	20	Listiana & Mutmainah (2022); Irfany et al. (2023); Zawawi et al. (2023)	To map the structural gaps of traditional waqf models and align the new framework's impact with global SDG indicators (specifically SDG 7, 13, and 15) as "patient capital".
Digital crowdfunding & smart contract architecture	20	Boutaa & Bengouia (2025); Desky & Hye (2025); Schwitzgebel et al. (2024)	To construct the tripartite model (collection, management, distribution), embed the automated screening algorithm, and resolve agency problems via blockchain and IoT reporting.

Source: Processed by Author (2026)

Secondary legal materials include previous literature discussing cash waqf crowdfunding models, waqf-blended finance, and digital donor behavior. To strengthen the methodological rigor and support the chosen research method, this study analyzed 74 secondary data sources, predominantly peer-reviewed journal articles from reputable global databases published in recent years. These sources were thematically classified into four main clusters to serve specific analytical purposes in the legal and model construction, as shown in [Table 1](#).

Data processing and analysis stages

The procedural stages of the research were conducted chronologically, transitioning from initial data mapping to final model construction. The validity of the model was tested through theory triangulation to ensure consistency between Sharia principles, positive regulations, and digital business feasibility. The data analysis process was conducted in three systematic stages: (1) decomposition, (2) value extraction, and (3) model reconstruction. To provide procedural clarity and a user-friendly overview of the complex data handling, the chronological steps of data processing comprising the inputs, processes, and outputs at each stage are visualized in [Table 2](#).

Table 2. Chronological stages of data processing and analysis

Research stage	Input (Data acquired)	Process (Analytical procedure)	Output (Findings/results)
Stage 1: Decomposition	Existing literature on crowdfunding and productive waqf models.	Dissecting existing crowdfunding and productive waqf models to map structural weaknesses and gaps in the implementation of green projects.	Identification of legal, practical, and structural gaps in current green waqf implementation.
Stage 2: Value extraction	Classical and contemporary doctrines of <i>fiqh al-bi'ah</i> .	Exploring the principles of <i>fiqh al-bi'ah</i> (such as <i>hifz al-bi'ah</i> and <i>imara al-ardl</i>).	A set of ethical and operational parameters derived from Islamic environmental jurisprudence.
Stage 3: Model reconstruction	Extracted ethical parameters, positive regulations, and SDG indicators.	Rearranging these elements into a new green waqf crowdfunding model that is integrated with SDG indicators.	A robust, theoretically sound, and practically viable three-layered model (collection, management, and distribution).

Source: Processed by Author (2026)

Results and Discussion

Decomposition of the digital waqf ecosystem: Explaining the ecological gap in Islamic social finance

Applying a deductive paradigm to execute Stage 1 (decomposition) of the research methodology, this section dissects existing literature on crowdfunding and productive waqf models to map their structural weaknesses and identify gaps in the implementation of green projects. A critical analysis of contemporary literature reveals that the global Islamic philanthropy ecosystem is undergoing a fundamental paradigm shift, transitioning from traditional altruism to a sophisticated, impact-oriented framework. Empirical data indicate that Islamic crowdfunding has contributed significantly to 11 of the 17 Sustainable Development Goals (SDGs), with a pronounced emphasis on poverty alleviation (SDG 1) and quality education (SDG 4). However, a significant legal and practical lacuna remains regarding environmental objectives, specifically climate action (SDG 13) and affordable and clean energy (SDG 7).

To understand why this disparity occurs within the context of Islamic Social Finance (ISF), one must examine the historical and psychological construct of waqf. Historically, waqf institutions have been structurally designed to provide immediate, tangible humanitarian relief, such as building mosques, hospitals, or funding orphanages. Consequently, contributors predominantly gravitate toward projects offering instant social gratification, overlooking environmental initiatives that yield long-term, systemic ecological benefits. Recent studies confirm that while crowdfunding

significantly mirrors the shift toward impact-oriented philanthropy (Ramdani et al., 2025), the under-representation of environmental goals suggests that the "social-humanitarian bias" remains a formidable psychological hurdle for holistic sustainable development (Böckel et al., 2020).

In the global discourse, this reflects a critical theological misunderstanding in which environmental preservation is often perceived as a "secular" state responsibility rather than a sacred, individual religious mandate. This psychological bias is further complicated by the mechanics of digital campaign narratives. Research by Bade and Reichenbach (2025) demonstrates a complex behavioral divergence, while emphasizing climate and sustainable communities in campaign narratives can theoretically enhance fundraising success; focusing solely on abstract infrastructure metrics paradoxically decreases donor engagement. Consequently, sustainable crowdfunding in ISF remains episodic and underutilized, failing to effectively synthesize environmental, social, and economic dimensions into a unified impact strategy (Michelino et al., 2025).

From a normative-analytical perspective, this psychological hurdle is further exacerbated by a structural "vacuum of norm" within Indonesia's legal framework. The root of this ecological lag in the digital waqf ecosystem is inextricably linked to the static interpretation of prevailing regulations. Law No. 41 of 2004 and Government Regulation (PP) No. 42 of 2006 inherently stipulate that waqf instruments are intended for worship and "public welfare," mandating their productive management (Musthafa & Sariningsih, 2024). Although the modernization of Indonesian waqf law continuously progresses toward a more comprehensive understanding and integrative governance (Huda, 2012), this positive legal framework has not yet specifically directed its utilization toward ecological agendas. The primary focus of both regulation and practical implementation remains heavily dominated by traditional socioeconomic dimensions, lacking any explicit legal articulation regarding the urgency of environmental preservation (Hilmi, 2012; Wahidah, 2025). Because environmental protection has not been definitively codified as a priority object within the legal category of "public welfare," nazhirs (waqf managers) across various digital platforms tend to replicate consumptive-social funding patterns (Muthawalli et al., 2025).

Consequently, this normative vacuum severely limits the potential convergence of waqf with financial technology. While Indonesia has catalyzed innovative instruments, such as cash waqf-linked sukuk and waqf-blended finance models, to address liquidity constraints (Lahuri & Lutfiah, 2024), its primary institutional weakness is the absence of a comprehensive and specific "green sharia taxonomy." Without a standardized classification system to distinguish general social projects from specialized environmental initiatives on Sharia crowdfunding platforms, tracking precise ecological impacts remains an elusive task. The potential for "green waqf" to support sustainable industries, such as the tamanu industry, demonstrates a synergistic alignment between economic viability and environmental stewardship (Fikri & Andrean, 2023). However, the current Indonesian green taxonomy remains largely voluntary, relying on self-assessment mechanisms devoid of independent third-party verification. This regulatory gap heightens the risk of "greenwashing" and obscures the legitimate classification of eco-friendly projects (Alfarisi & Huda, 2023; Rahmawati et al., 2025).

A policy intervention positioning the Indonesian Waqf Board (BWI) as the central actor is imperative as a prescriptive measure to reconstruct this multifaceted juridical and practical anomaly. Within the literature on Sharia economic law, the BWI serves as the pivotal institution for strengthening the governance and institutional capacity of digital productive waqf (Hilmi, 2012). Derivative regulations, specifically the BWI Regulations (PerBWI), must be operationalized as instruments of social engineering to direct the behavior of philanthropic platform managers when field practices do not organically respond to contemporary challenges (Musthafa & Sariningsih, 2024). Therefore, it is urgent for the BWI to formulate a new PerBWI that explicitly incorporates "environmental restoration and sustainability" into the operational definition of "public welfare." Through this juridical reconstruction, the financing of green projects will transition from a mere moral preference into a structured institutional mandate for digital crowdfunding platforms. This shift is highly congruent with the proactive trajectory of waqf legal reform rooted in maqasid al-Sharia, ensuring that digital waqf becomes a sustainable financing instrument that strictly complies with both fiqh principles and global sustainability standards.

Extracting *fiqh al-bi'ab* values: From formal compliance to substantive ecological justice

From a normative-analytical perspective, contemporary discourse on Islamic financial governance in Indonesia reveals that *Sharia* compliance remains trapped within a procedural-contractual dimension (Makraja, 2023; Seftiani et al., 2025). Current Islamic crowdfunding practices predominantly focus on avoiding elements of *riba* (usury) and *gharar* (uncertainty), and ensuring the physical permissibility of the business object; yet, they frequently fail to address the substantive dimension of preventing environmental degradation. An analysis of various fatwas issued by the National Sharia Board of the Indonesian Ulema Council (DSN-MUI) in the financial and capital market sectors indicates that the ecological impact of business activities is often neglected in the *Sharia* screening process (Hendratmoko et al., 2024; Nelly et al., 2022). This creates a legal anomaly in which a productive waqf project can be contractually labeled as "halal," even if its operational activities possess the potential to destroy environmental sustainability (*hifẓ al-bi'ab*).

This specific normative vacuum creates a severe *Sharia* compliance problem within the digital waqf crowdfunding ecosystem. Currently, Islamic crowdfunding platform operators merely refer to general fatwas regarding financing or securities crowdfunding (SCF), lacking a specific jurisprudential guideline that governs the integration of *hifẓ al-bi'ab* into philanthropic instruments (Ardiana & Baidhowi, 2025; Maryani et al., 2025). Various literature studies and bibliometric reviews on Islamic crowdfunding explicitly highlight the urgency of formulating specific *fiqh* guidelines concerning ecological waqf (Fakhrudin et al., 2024; Maryani et al., 2025; Mustofa et al., 2024). The absence of this thematic fatwa causes the implementation of crowdfunding to fail in fulfilling the comprehensive essence of *maqasid al-Sharia*, which intrinsically demands absolute harmonization among economic growth, social justice, and environmental sustainability (Syarif & Aysan, 2024).

To address these existing lacunae and challenge the global trend of legal formalism in Islamic finance, this study advances to Stage 2 (value extraction) of the research methodology within a prescriptive-analytical framework. The study systematically explores classical and contemporary doctrines of *fiqh al-bi'ab* (Islamic environmental jurisprudence) to derive a set of ethical and operational parameters that serve as a robust normative foundation. Within this proposed framework, *fiqh al-bi'ab* is re-conceptualized not merely as a theological justification for nature conservation, but as a set of transformative operational indicators for modern waqf management, ensuring the substantive realization of *maqasid al-Sharia*.

The primary principle distilled from this extraction is *hifẓ al-bi'ab* (preservation of the environment), which must be juridically positioned on an equidistant footing with *hifẓ al-mal* (preservation of wealth). In the realm of global social entrepreneurship and productive waqf, this equivalence dictates a radical shift: project profitability must never be pursued at the expense of ecological integrity. This is inextricably linked to the second pivotal principle, *Imara al-Ardh* (prospering the earth), which imposes a fiduciary duty upon the *Nazhir* (waqf manager) to proactively select and manage assets with regenerative functions. Unlike conventional charity models that focus primarily on asset preservation, a *fiqh al-bi'ab*-based "Green Waqf" mandates an active enhancement of environmental quality, such as the conversion of degraded lands into productive forests utilizing traditional mechanisms, such as the *Hima* model (Anisa, 2025; Umam et al., 2024). Empirical evidence suggests that when waqf is utilized as a tool for sustainable development, it transcends its traditional role, becoming a dynamic instrument for ecological and social value creation (Malaab, 2024).

Furthermore, the operationalization of these values necessitates the application of the legal maxim *la darar wa la dirar* (do no harm and reciprocate no harm), which serves as the foundational logic for "negative screening" mechanisms. Legally, any project with a significant carbon footprint or potential for biodiversity degradation must be automatically disqualified, regardless of its *Sharia*-compliant label or financial projections, to prevent environmental *mufsadat* (harm) (Fadel et al., 2025). The rigorous application of this principle provides a distinct ethical weight, anchoring compliance in non-negotiable Islamic values (Sulistiani & Gumilar, 2025). Finally, the concept of *Al-Miẓan* (balance/equilibrium) dictates that while the waqf principal must remain intact, a portion of the returns must be systematically reinvested into nature conservation. This cyclical reinvestment creates an Islamic circular economy, ensuring that the waqf remains a "perpetual charity" (*Sadaqah Jariyah*) in both the spiritual and ecological senses.

As a culminating juridical prescription, the Sharia authority (DSN-MUI) is urgently required to issue a specific fatwa on "Green Waqf Crowdfunding" that officially incorporates these extracted parameters. In the theory and practice of the Indonesian legal system, DSN-MUI fatwas have transformed into "living law" because their binding force is continually adopted into state positive regulations by both the Financial Services Authority (OJK) and Bank Indonesia (Sudi, 2025). This specific fatwa must integrate the principles of *la darar, maslahah 'ammah* (public interest), and *hifz al-bi'ah* as fundamental conditions for the validity of the contract (*syurut al-sibhah*) in the management of productive waqf (Saputra et al., 2025). Through this instrument, any waqf project that is subsequently proven to cause ecological destruction (*fasad*) will be legally classified as a defective contract (*fasid*). This legal engineering step will radically transform the position of *fiqh al-bi'ah* from what was originally merely a voluntary conservation ethic into a strictly binding justiciable norm, bringing about logical consequences, such as contract annulment and the restructuring of the green project.

Reconstruction of the green waqf crowdfunding model: Solving the agency problem

As a manifestation of Stage 3 (model reconstruction) of the research methodology, this study employs a prescriptive-analytical approach to rearrange the extracted ethical parameters, positive regulations, and SDG indicators into a robust, theoretically sound, and practically viable crowdfunding architecture. From a normative-analytical perspective, current information technology (IT)-based lending and Sharia crowdfunding models in Indonesia are solely oriented toward financial default mitigation. Based on prevailing Financial Services Authority (OJK) regulations, governance frameworks are predominantly focused on securing investor capital against economic threats, leaving the dimension of environmental sustainability risk uninstitutionalized at the level of electronic contracts. Consequently, platform operators tend to reduce Sharia compliance to mere contractual formalities, exposing the philanthropic ecosystem to the risk of funding economically profitable but ecologically destructive waqf projects, thereby violating the fundamental principles of ecological justice in Islam.

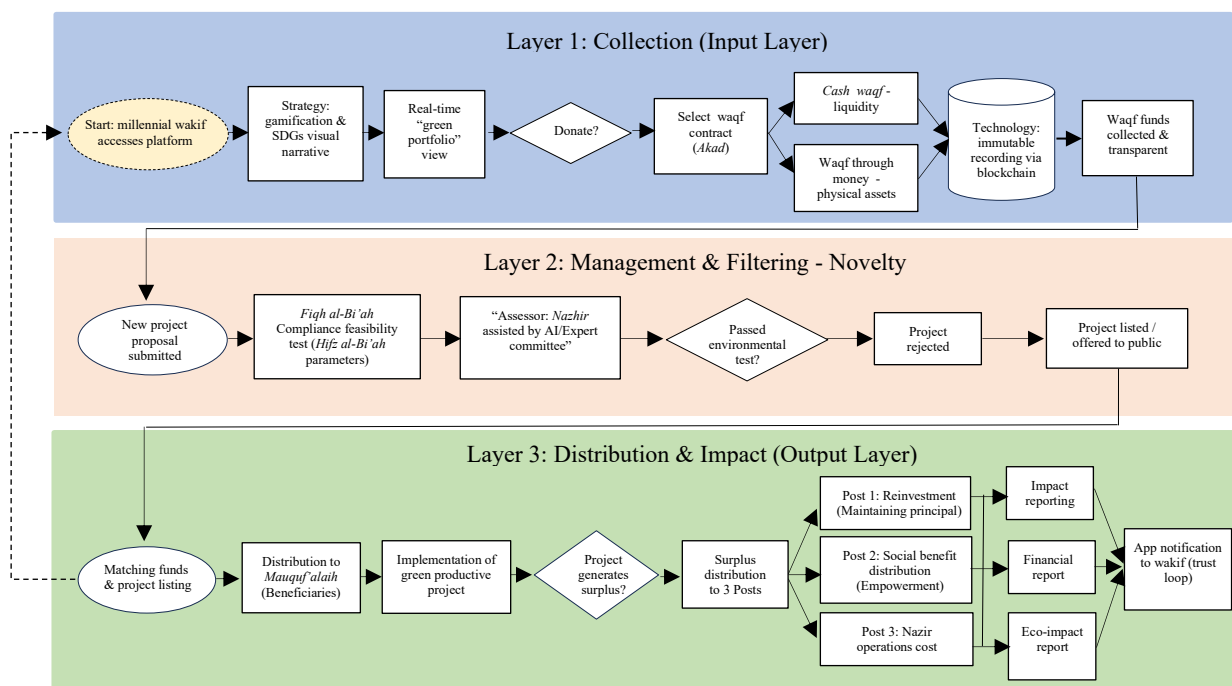


Figure 1. Flowchart of the green waqf crowdfunding model based on technology and *fiqh* integration
Source: Author's own elaboration (2026)

To bridge this normative void and resolve the inherent agency problem between donors and platform managers, this study synthesizes the principles of *fiqh al-bi'ah* with contemporary financial technology to propose a transformative framework: the "Integrated Green Waqf

Crowdfunding Model.” This framework challenges the status quo by ensuring that Sharia compliance is dynamically audited against both financial transparency and ecological integrity. The architecture consists of three distinct yet interconnected layers: (1) the collection layer (input), (2) the management and filtration layer (process), and (3) the distribution and impact layer (output). To facilitate understanding, a diagram of this integrated model is presented in Figure 1.

At the collection layer, the model utilizes sophisticated gamification strategies and SDG-aligned visual narratives to catalyze engagement among millennial donors. Global research indicates that narratives emphasizing sustainability significantly enhance pro-environmental charitable behavior by fostering feelings of agency and hope (Schwitzgebel et al., 2024; Shreedhar et al., 2023). To ensure absolute transparency and mitigate information asymmetry, this model integrates blockchain technology to create an immutable ledger of contributions. This alignment with real-time "green portfolios" caters to the digital donor's demand for traceability, securing a high level of institutional trust, which is a critical prerequisite for sustainable fundraising (Li et al., 2025; Park & Cho, 2020).

The management and filtration layer represents the primary theoretical and juridical novelty of this research. In this phase, the model introduces a rigorous *fiqh al-bi'ah* compliance test as a "hard-filter" mechanism. Prescriptively, to enforce this filter, the model embeds a "green clause" within the Sharia smart contract architecture. Drawing upon the Sharia economic law instrument of *khijyar* (right of cancellation), which is vital for ensuring transaction justice in e-commerce (Hafid et al., 2024), this clause technically links *khijyar syarat* (conditional cancellation) directly to the fulfillment of environmental audit parameters. If a funded project, such as a micro-hydro power plant, triggers *mafsadat* (ecological damage) and fails the ongoing AI-assisted audits, the smart contract system authorizes the *nazhir* (waqf manager) to automatically and unilaterally cancel the agreement and halt the flow of funds (Boutaa & Bengouia, 2025; Desky & Hye, 2025).

In the distribution and impact layer, mobilized capital is allocated to *Manquf 'alaih* (beneficiaries) through productive, eco-centric ventures. Crucially, the model replaces traditional, one-dimensional financial reporting with comprehensive eco-impact reports. These reports utilize Internet of Things and satellite data to provide donors with empirical evidence of ecological progress, such as carbon sequestration or hectares of forest restored. This integration directly addresses the core variables of technology acceptance model 3 (TAM3), perceived usefulness and ease of use (Abduh et al., 2024; Amirsyah et al., 2025), thereby institutionalizing a culture of continuous participation in the Islamic green economy.

From the perspective of Indonesian positive law, this integration of technological and contractual engineering significantly strengthens legal certainty for all parties (Wahdan et al., 2025). Automated *khijyar* clauses executed via smart contracts, alongside blockchain-verified eco-impact reports, are fully recognized as integral parts of valid electronic agreements under the Indonesian Electronic Information and Transactions Law (UU ITE) (Hafid et al., 2024). This justiciable recognition provides a highly robust foundation for contractual litigation under civil law in the event of an ecological dispute. Ultimately, this jurisprudential innovation not only successfully resolves the agency problem through immutable transparency but also transforms digital green waqf into a legally enforceable instrument for the preservation of the earth.

SDG acceleration strategy and policy implications: A global roadmap

From a normative-analytical perspective, the implementation of green waqf in Indonesia is currently impeded by acute institutional fragmentation and cross-sectoral regulatory disharmony. Although the government has initiated the Indonesian green taxonomy at the general investment level, its field implementation is frequently constrained by weak institutional capacity and a high risk of greenwashing. The waqf ecosystem in Indonesia is considered conceptually robust on paper; however, the actualization of productive waqf is hindered by regulatory loopholes and a lack of coordination among relevant authorities. Without a binding national taxonomy that is synergistically coordinated between central and regional governments, ecological philanthropy initiatives through digital platforms will continue to operate partially, failing to deliver measurable structural impacts for sustainable development (Aisyah et al., 2025).

In the context of integrating *fiqh al-bi'ah* into national environmental governance, research reveals a significant disconnection between Sharia norms and positive environmental law instruments. The absence of official legal instruments recognizing "green Islam" philanthropic entities, such as eco-waqf or green zakat, constitutes a primary barrier to SDG acceleration in Indonesia (Maskun et al., 2025). Current regulations have not fully assimilated the principles of Islamic environmental preservation into national environmental law. Consequently, philanthropic projects labeled as "green" frequently operate without science-based, auditable technical standards, thereby widening the opportunity for greenwashing practices disguised behind pseudo-Sharia compliance (Hadi et al., 2025; Lubis & Marpaung, 2025).

To overcome this regulatory impasse, the implementation of the proposed integrated green waqf crowdfunding model serves as a strategic catalyst for accelerating the SDGs through non-sovereign, non-state budget (non-APBN) channels. By mobilizing private philanthropic capital, this model offers a sustainable alternative to conventional fiscal instruments, particularly for SDG 7 (Affordable and Clean Energy). Such micro-energy projects are frequently categorized as "non-bankable" by commercial institutions because of high risk profiles and long payback periods. However, waqf, characterized as "patient," interest-free capital, uniquely transforms these initiatives into financially viable ventures (Listiana & Mutmainah, 2022). Extant research underscores that waqf possesses the inherent capacity to bridge the financing gap in renewable energy while simultaneously addressing wealth disparity, outperforming conventional commercial loans in rural contexts (Ari & Koc, 2021; Ibrahim, 2023; Muklis et al., 2025). By synthesizing the roles of local communities, the private sector, and philanthropic actors, the green waqf community model fosters a resilient ecosystem for rural energy transition (Faizi et al., 2024).

Furthermore, the explicit integration of *fiqh al-bi'ah* within this model contributes significantly to SDGs 13 (climate action) and 15 (life on land). By designating waqf areas as "Green Belts" protected by both religious sanctity and state law, this model institutionalizes a formidable barrier against environmental degradation (Rusydziana, 2023). Aligning with global environmental discourse, empirical evidence suggests that faith-based conservation often achieves higher compliance and efficacy than "top-down" government mandates, as it resonates deeply with the spiritual values of local communities (Muhammad et al., 2025; Shahmi et al., 2025). Green waqf thus serves as a multidimensional tool for reforestation and biodiversity preservation (Ali & Kassim, 2020; Baharin et al., 2025; Rusydziana, 2023).

However, to effectively operationalize this model and prevent ethical arbitrage, establishing a normative basis for a "green waqf taxonomy" as positive law is imperative. A comparison with the sustainable waqf law model in Saudi Arabia demonstrates that structured sustainable waqf regulations can simultaneously generate positive impacts across social, economic, and environmental dimensions, directly contributing to the achievement of various SDG targets (Zawawi et al., 2023). Furthermore, studies on green investments in Indonesia, referencing the EU taxonomy, recommend the urgency of science-based technical standards that are cross-sectorally binding (Aisyah et al., 2025). Such a comprehensive approach must be adapted into the national waqf ecosystem to classify the eligibility of waqf projects according to measurable, transparent, and independently auditable environmental impact criteria.

As a strategic policy prescription, this study recommends the issuance of an inter-institutional joint ministerial decree (Surat Keputusan Bersama/SKB) involving the Indonesian Waqf Board (BWI), the Financial Services Authority (OJK), the Ministry of Environment and Forestry (KLHK), and the National Sharia Board (DSN-MUI). This collaborative regulation aims to codify the standardized "green waqf taxonomy" as nationally binding positive law. By mainstreaming green waqf into environmental and sustainable development goal (SDG) policies, this taxonomy will serve as a legal shield to prevent greenwashing while providing legal certainty for wakif (donors) and fintech platform managers. Furthermore, the government should consider the implementation of fiscal incentives, such as tax deductions for wakif or regulatory fee waivers for platforms, to stimulate the growth of the green waqf ecosystem. In conclusion, this cross-authority harmonization will transform waqf from a mere ritual worship instrument into a central legal and financial instrument within Indonesia's sustainable finance architecture (Anwar et al.,

2025; Irfany et al., 2023), challenging the status quo of Islamic social finance by demanding that ecological preservation be treated not as an optional charity, but as a strict, verifiable religious obligation.

Conclusion

This study successfully achieved its primary objective of constructing an integrated green waqf crowdfunding model grounded in *fiqh al-bi'ah* principles to accelerate the Sustainable Development Goals (SDGs) in Indonesia. The results of the model construction demonstrate that addressing the ecological gap in Islamic social finance requires a paradigm shift from formal contractual compliance to substantive ecological justice. By embedding a "green clause" based on the *khiyar* (right of cancellation) instrument within smart contracts, this model technically positions environmental preservation (*hifz al-bi'ah*) as a mandatory condition for contract validity (*syurut al-shibbah*).

The broader implications of this study are theoretically and practically significant. Theoretically, this framework challenges the status quo of legal formalism by transforming *fiqh al-bi'ah* from a voluntary moral ethic into a strictly binding, justiciable norm. Practically, the integration of blockchain and internet-of-things (IoT)-based eco-impact reporting effectively mitigates agency problems and information asymmetry. This technological architecture unlocks waqf as "patient capital" to fund critical renewable energy and conservation projects while shielding the digital philanthropy ecosystem from greenwashing practices.

Despite these contributions, it is crucial to acknowledge the limitations of this research. Primarily, the proposed framework is at a conceptual and normative-analytical stage. Because the study has not yet measured operational effectiveness and real market responses through field applications, the technical readiness of Nazhir institutions and the actual behavioral shifts of millennial donors in adopting this specific model remain theoretically projected rather than empirically validated.

Consequently, to advance this field, we propose a clear set of recommendations. As a suggestion for further development, future research should test the validity of this conceptual model through empirical studies or pilot projects at selected nazhir institutions. In addition, further technical exploration of blockchain architecture for carbon footprint recording on waqf assets is a strategic research area. Finally, for macro-policy implementation, it is highly recommended that the Indonesian government formulate a joint ministerial decree (SKB) involving the Indonesian Waqf Board (BWI), the Financial Services Authority (OJK), the Ministry of Environment and Forestry (KLHK), and the National Sharia Board (DSN-MUI) to codify a standardized "Green Waqf Taxonomy" as a unified, legally binding framework for Sharia fintech platforms.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used Gemini AI, DeepL, Grammarly, and Bing translator to translate from Bahasa Indonesia into American English and improve the clarity of the language and readability of the article. After using these tools, the authors reviewed and edited the content as needed and took full responsibility for the content of the published article.

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