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Blended Islamic philanthropy model of *green sukuk* and *digital waqf*: *Maqasid al-Shariah* approach to sustainable economic development in Indonesia

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ABSTRACT

Indonesia's agriculture and fisheries sectors face an annual financing gap that existing conventional banking and Islamic financial instruments, which operate separately, have failed to address. Three unresolved gaps motivate this study: empirically, no prior study has measured the combined mobilization potential of Indonesia's cumulative *green sukuk* program and *digital waqf* against this structural financing deficit; theoretically, no integrated governance framework grounded in *Maqasid al-Shariah* has been proposed to connect philanthropic *waqf* capital with commercial *sukuk* financing in a single blended architecture; and at the policy level, the regulatory divide between OJK and BWI lacks a unified instrument design. This paper proposes the *Maqasid*-Based Blended Islamic Philanthropy (MBIP) Model, a novel three-layer architecture integrating *digital waqf* as a first-loss philanthropic foundation, *green sukuk* as the commercial-concessional superstructure, and a blockchain-enabled Digital Governance Architecture as the integrating keystone. Employing a PRISMA-guided systematic literature review and secondary data analysis from OJK, BWI, BPS, and DJPPR, the model operationalizes all five *Maqasid al-Shariah* objectives with proposed measurable indicators (*waqf* mobilization rate, *sukuk* yield spreads, SDG alignment scores) and aligns with key SDGs. The study contributes four testable propositions and actionable policy recommendations for OJK, BWI, and DSN-MUI.

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1. Introduction

Indonesia stands at a critical juncture in its sustainable development trajectory. As the world's largest archipelagic nation and the fourth most populous country, Indonesia's 2045 Golden Vision targets inclusive and resilient economic growth. Yet persistent structural inequalities remain: the agriculture and fisheries sectors collectively employ approximately 28.8% of the national labor force (Badan Pusat Statistik, 2023), yet contribute only 13.7% of GDP and remain chronically underfinanced by conventional banking systems. The Indonesian Financial Services Authority (OJK) reports that formal credit penetration in rural agricultural communities stands at merely 16.3%, leaving a financing gap estimated at IDR 400 trillion annually (Otoritas Jasa Keuangan, 2023).

Simultaneously, Indonesia holds two substantially underutilized Islamic financial instruments of enormous developmental potential. First, *green sukuk*—Islamic securities aligned with environmental sustainability have grown steadily since Indonesia issued the world's first sovereign *green sukuk* in February 2018 (Direktorat Jenderal Keuangan dan Manajemen Risiko, 2023). Second, *digital waqf,* the digitized management of Islamic endowment assets, carries a conservative annual mobilization potential of IDR 180 trillion (Badan Wakaf Indonesia, 2023), yet Badan Wakaf Indonesia reports that productive deployment stands below 1% of that potential. These instruments operate in entirely separate institutional ecosystems, governed by different regulatory authorities, targeting different investor classes, and serving different beneficiary communities despite partially overlapping sectoral objectives.

The concept of Blended Finance has gained global traction through the OECD DAC Blended Finance Principles and the SDG Financing Framework, which argue that development finance and philanthropic capital should be deployed strategically to catalyze commercial investment (Convergence, 2020; OECD, 2018). However, its Islamic adaptation, Blended Islamic Philanthropy (BIP), remains theoretically nascent, particularly in how it integrates *waqf* (philanthropic) and *sukuk* (commercial) instruments within a unified governance framework grounded in *Maqasid al-Shariah*. Thaker et al. (2020) identified this gap as a priority research agenda, a call that has remained largely unaddressed in the subsequent literature.

A systematic review of the literature reveals that while *green sukuk* has been studied from capital market perspectives (Ascarya & Rahmawati, 2021; Lahuri & Rizki, 2025; Setyowati et al., 2022), and *digital waqf* from a technological-philanthropic lens (Azmi et al., 2022; Sudirman et al., 2020), no study has proposed an integrated blended model connecting both instruments within a *Maqasid al-Shariah*-grounded sustainable development framework applicable to Indonesia's agriculture and fisheries sectors. This gap is particularly consequential given Indonesia's commitments under the SDGs and its National Medium-Term Development Plan (RPJMN 2020–2024). However, previous studies have not proposed an integrated blended model that simultaneously connects these two instruments within a *Maqasid al-Shariah*-grounded sustainable development framework. Specifically, three unresolved gaps persist: (1) empirically, the combined mobilization potential of *green sukuk* and *digital waqf* has never been benchmarked against the IDR 476 trillion sectoral financing gap; (2) theoretically, no study has constructed a three-layer blended architecture integrating first-loss philanthropic capital with commercial *sukuk* tranches under a *Maqasid al-Shariah* governance framework; and (3) at the policy level, the regulatory

divide between OJK (sukuk) and BWI (waqf) has not been addressed through a unified instrument design.

This study addresses three core research questions: (1) How can a Blended Islamic Philanthropy model be designed to systematically integrate *green sukuk* and *digital waqf*? (2) How does such a model operationalize the principles of *Maqasid al-Shariah* with measurable indicators? and (3) what are the policy implications for sustainable economic development in Indonesia's agriculture and fisheries sectors? Positioning within the literature: while Thaker et al. (2020) identified the *waqf–sukuk* integration gap as a priority research agenda, their framework lacked operational layer design and governance architecture, as well as examined *green sukuk* in isolation. Azmi et al. (2022) addressed *waqf* digitalization without capital market linkage. This study advances beyond these contributions by proposing a complete, governance-grade integrative model—the MBIP Framework. The paper contributes: (a) the first integrated blended Islamic philanthropy architecture in the literature; (b) empirical mapping of Indonesia's *green sukuk* and *waqf* ecosystems (2018–2023) with gap quantification; (c) four testable propositions; and (d) feasibility-assessed policy recommendations for OJK, BWI, and DSN-MUI. The paper proceeds as follows: Section 2 reviews the literature; Section 3 describes the methodology; Section 4 presents the results and the MBIP model; Section 5 concludes.

2. Literature Review

Blended Finance and Its Islamic Adaptation

Blended finance is defined by the World Bank OECD (2018) as the strategic use of development finance and philanthropic funds to mobilize private capital flows to emerging and frontier markets. Convergence (2020) identifies four principal blending mechanisms: guarantees, concessional capital, technical assistance, and equity stakes. In Islamic finance, the concept has been adapted to what scholars term Blended Islamic Finance or Blended Islamic Philanthropy (BIP), an arrangement in which Islamic social finance instruments (zakat, waqf, sadaqah) serve as the concessional or philanthropic tranche, de-risking commercial Islamic instruments (sukuk, murabaha, musharakah) to crowd in private sector capital (Lahsasna, 2020; Thaker et al., 2020). The theoretical grounding of BIP draws from the principles of *maslahah* (public welfare) and *ta'awun* (mutual assistance), which mandate cooperative resource mobilization for community benefit (Chapra, 2008; Hassan & Saraç, 2020). Within Islamic finance, the adaptation of blended finance principles is nascent but accelerating. Thaker et al. (2020) identified Islamic social finance instruments, particularly *waqf* and *zakat,* as underutilized first-loss buffers for commercial Islamic finance structures, but did not operationalize this integration architecturally. Hassan and Saraç (2020) noted that blended Islamic finance requires a *Shariah*-compliant governance overlay that conventional blended finance structures lack. The MBIP model directly addresses both gaps by designing a three-layer architecture where *Maqasid al-Shariah* serves simultaneously as the normative framework and the operational governance standard.

Green Sukuk: Evolution and Role in Sustainable Finance

Sukuk are *Shariah*-compliant financial certificates representing proportional ownership in an underlying tangible asset or project cash flows, distinct from conventional bonds, which

represent pure debt obligations (Accounting and Auditing Organization for Islamic Financial Institutions, 2017). *Green sukuk* applies the *sukuk* structure specifically to environmentally beneficial projects, such as renewable energy, sustainable agriculture, green infrastructure, and climate adaptation, aligning Islamic finance with the global ESG investment agenda. Indonesia pioneered sovereign *green sukuk* globally with its inaugural USD 1.25 billion issuance in February 2018, followed by a sustained issuance program. Setyowati et al. (2022) document that Indonesia's *green sukuk* allocations have funded projects across renewable energy (37%), sustainable transport (28%), climate resilience (20%), and waste management (15%) between 2018 and 2022. Lahuri, and Rizki (2025) argues that *green sukuk* represents a natural *Shariah* fit because Islam's environmental stewardship ethic, rooted in the concept of *khalifah* (vicegerency), aligns inherently with green finance objectives (Octaviano, 2026). However, critics note that without dedicated governance mechanisms linking returns to community-level outcomes, *green sukuk* risk becoming financial products with a sustainability label rather than genuine developmental instruments (Lahsasna & Hassan, 2020). Despite this growth, Indonesia's *green sukuk* allocation to agriculture and fisheries remained at only 12.4% of cumulative issuance through 2023 (DJPPR, 2023)—underscoring the sectoral allocation gap that the MBIP model is designed to address. Setyowati et al. (2022) found that institutional and regulatory barriers, rather than demand deficiencies, are the primary constraints on *green sukuk* market deepening in Indonesia, a finding consistent with this study's policy recommendations.

Digital *Waqf*: Technological Evolution and Implementation Challenges

Waqf (Islamic endowment) is a perpetual dedication of an asset by a donor (waqif) to a trustee (nazhir) for charitable purposes, with the principal irrevocable and only the *usufruct* distributed to beneficiaries. Historically a property-based institution, *waqf* has been revitalized through Cash *Waqf* (recognized by DSN-MUI Fatwa No. 43/2004) and further digitized via online platforms, blockchain registries, and big data-driven impact tracking systems (Azmi et al., 2022; Sudirman et al., 2020). *Digital waqf* platforms, including BWI's Online *Waqf*, Dompet Dhuafa's *Wakaf Hasanah*, and emerging blockchain-based *nazhir* networks, have expanded donor accessibility and fund traceability. BWI (2023) reports that *digital waqf* collections grew by 47% year-on-year between 2020 and 2023. Nevertheless, key implementation challenges persist: (1) low awareness among the Muslim population, (2) inadequate *nazhir* capacity for productive *waqf* management, (3) absence of standardized digital reporting, and (4) limited integration with formal capital markets (BWI, 2022; Saiti et al., 2018). The literature strongly suggests that *waqf*'s developmental potential can only be unlocked through institutional-grade governance and financial market linkages (Çizakça, 1998; Thaker et al., 2020). Azmi et al. (2022) identified three critical implementation challenges for *digital waqf* in Indonesia: (i) heterogeneous digital literacy among *nazhir* institutions; (ii) absence of a standardized digital asset registry; and (iii) regulatory ambiguity regarding the legal status of tokenized *waqf* assets. The MBIP model's WRMS (blockchain waqf registry) and DNN (Digital Nazhir Network) components are specifically designed to address challenges (i) and (ii). Challenge (iii)—regulatory clarity on tokenized *waqf*—remains contingent on a DSN-MUI *fatwa*, which this study identifies as the highest-priority policy prerequisite.

Maqasid al-Shariah as an Analytical Framework

Maqasid al-Shariah (the higher objectives of Islamic law), as systematized by Imam al-Ghazali and elaborated by Ibn Ashur (2006), identifies five essential human interests: *hifz al-din* (preservation of faith), *hifz al-nafs* (preservation of life), *hifz al-'aql* (preservation of intellect), *hifz al-nasl* (preservation of progeny/social continuity), and *hifz al-mal* (preservation of wealth). Contemporary scholars, including Dusuki and Bouheraoua (2011), have extended this framework to Islamic finance and economics, arguing that financial instruments must be evaluated not merely for *Shariah* technical compliance but for their contribution to these five objectives. In the MBIP context, *hifz al-mal* demands productive deployment of idle capital; *hifz al-nasl* supports intergenerational asset endowment; *hifz al-nafs* aligns with food security and health outcomes; *hifz al-'aql* encompasses *nazhir* capacity-building; and *hifz al-din* ensures continuous *Shariah* compliance. Notwithstanding the richness of *Maqasid* scholarship, a persistent gap in the Islamic finance literature is the absence of operationally measurable *Maqasid* indicators applicable to structured financial products (Dusuki & Bouheraoua, 2011). Most existing frameworks remain at the level of normative categorization rather than quantitative benchmarking. This study addresses this gap by proposing five-objective-specific measurable indicators (Section 4.3) that enable future empirical testing of *Maqasid* alignment in blended Islamic finance structures.

Sustainable Economic Development from an Islamic Perspective

Islamic economics frames sustainable development through the lens of *falah* (comprehensive wellbeing) rather than purely material GDP growth (Chapra, 2008). Beik and Arsyianti (2016) empirically demonstrate that *zakat* and *waqf* programs, when properly governed, significantly reduce multi-dimensional poverty in rural agricultural communities. The convergence of Islamic developmental finance with the SDG framework, particularly SDGs 1 (No Poverty), 2 (Zero Hunger), 8 (Decent Work), 13 (Climate Action), 14 (Life Below Water), and 17 (Partnerships), provides the normative environment for the proposed MBIP model. Mohieldin et al. (2012) argue that Islamic finance instruments are uniquely positioned to enhance financial inclusion in OIC member countries through their redistributive character, a thesis the MBIP model seeks to operationalize through blended architecture.

3. Research Method

This study employs a mixed-method exploratory-conceptual research design comprising three sequential phases: systematic literature review, secondary data analysis, and conceptual model development guided by the design science research methodology (Hevner et al., 2004).

Phase 1 – Systematic Literature Review (PRISMA-Guided): A structured search was conducted across Scopus, Web of Science, Google Scholar, and SINTA-indexed databases (S1–S3) using Boolean query strings combining '*green sukuk*,' '*digital waqf*,' 'Blended Finance,' '*Maqasid al-Shariah*,' and 'Sustainable Development.' The search covered publications from 2010 to 2024. The PRISMA screening process comprised four stages: (1) Identification 312 records retrieved from database searches, plus 28 additional records from reference list screening (total: 340); (2) Screening 187 records excluded after title and abstract review (duplicates: 43; irrelevant to Islamic finance or sustainability: 144); (3) Eligibility 153 full-text articles assessed;

66 excluded (no Maqasid or SDG alignment: 38; did not meet the methodological criteria in Table 2: 28); (4) Inclusion 87 articles retained for thematic synthesis. See Table 1 for detailed PRISMA inclusion/exclusion criteria.

Table 1. PRISMA-Guided Screening Flow

	Stage	Action & Criteria	Records
1	Identification	Database search (Scopus, WoS, Google Scholar, SINTA S1–S3) using Boolean query strings; reference list screening of retrieved articles	**312 (database) + 28 (reference lists) = 340 total**
2	Screening	Title & abstract review; exclusion of: duplicates (n=43); articles irrelevant to Islamic finance or sustainability (n=144)	**187 excluded 153 retained**
3	Eligibility (Full-text)	Full-text assessment against Table 2 criteria; exclusion of: no *Maqasid*/SDG alignment (n=38); methodological exclusions per Table A (n=28)	**66 excluded 87 retained**
4	Inclusion	87 articles included in final thematic synthesis; themes: blended finance, green sukuk, *digital waqf*, *Maqasid al-Shariah*, sustainable development	**87 articles (final corpus)**

Source: Authors, 2025

The PRISMA-guided screening process presented in Table 1 demonstrates the sequential filtering stages used to ensure the relevance and methodological rigor of the reviewed studies. Following the screening flow, Table 2 specifies the detailed inclusion and exclusion criteria applied during the full-text assessment stage. These criteria were designed to maintain consistency in article selection and ensure alignment with the study's thematic focus on Islamic finance, sustainable development, and *Maqasid al-Shariah*-based analysis.

Table 2. Systematic Literature Review Inclusion/Exclusion Criteria (PRISMA-Guided)

Criterion	Inclusion	Exclusion
Publication type	Peer-reviewed journal articles, book chapters, official reports	Conference abstracts, grey literature without peer review
Language	English and Indonesian	Other languages
Time period	2010–2024	Before 2010
Thematic scope	Islamic finance, *waqf*, *green sukuk*, blended finance, *Maqasid*, sustainable development	Conventional finance without Islamic dimension
Database	Scopus, WoS, Google Scholar, SINTA (S1–S3)	Non-indexed sources

Geographic focus	Global with emphasis on Indonesia and OIC countries	Studies with no relevance to Islamic economy

Source: Authors, 2025

Phase 2 – Secondary Data Analysis: Quantitative data were sourced from: (a) OJK green sukuk and SDGs *Sukuk* Allocation Reports (2018–2023); (b) BWI Annual Reports (2019–2023); (c) BPS Keadaan Ketenagakerjaan February 2023; (d) DJPPR *green sukuk* issuance data; (e) Kementerian Pertanian (Kementan) and KKP sector financing plans (2023); and (f) World Bank Indonesia economic indicators. The sectoral financing gap (Table 6) was calculated as follows: Financing Gap (i) = Estimated Sector Financing Need (i) − OJK-Reported Formal Bank Credit Outstanding (i), where i denotes each sector. Sector financing needs are government-published development plan targets (Kementan RPJMN 2020–2024; KKP Renstra 2020–2024) projections rather than realized expenditures. OJK credit data represent actual outstanding formal bank credit as of December 2023. Descriptive trend analysis mapped year-on-year changes in *green sukuk* issuance and *waqf* mobilization. This method was selected because it is appropriate for exploratory-conceptual research not claiming causal inference, and is consistent with prior Islamic finance gap analysis methodologies (Iqbal & Mirakhor, 2013; Mohieldin et al., 2012). Sensitivity note: if sector financing need projections are reduced by 15%, the total gap narrows to approximately IDR 405 trillion, which still substantially exceeds the combined *green sukuk* and *waqf* mobilization capacity under the status quo, preserving the core empirical argument.

Table 3. Sensitivity Analysis: Total Financing Gap Under Alternative Projection Assumptions

Scenario	Adjustment to Financing Need Projections	Total Gap (IDR Trillion)	Core Argument Status
Base Case	Government RPJMN/Renstra projections as published	**IDR 476T**	Confirmed: far exceeds combined instrument capacity
Conservative −15%	Financing need reduced by 15% to account for estimation uncertainty	**IDR 405T**	Confirmed: still substantially exceeds capacity
Optimistic −5%	Financing need reduced by 5%; OJK credit coverage increased by 10%	**IDR 440T**	Confirmed: gap remains structural and persistent

Source: Authors' Calculation, 2025

Phase 3 – Conceptual Model Development: The MBIP model was developed following Design Science Research (DSR) methodology (Hevner et al., 2004), which mandates that proposed constructs: (i) address a clearly identified problem; (ii) draw on established theory; (iii) demonstrate rigor in construction; and (iv) offer evaluable, communicable contributions. *Maqasid al-Shariah* served as the overarching analytical lens. Each model component was evaluated against the five *Maqasid* objectives and tested for internal consistency with Islamic finance regulatory

frameworks (DSN-MUI *fatwas*, OJK regulations, BWI governance standards). Methodological limitation: this study corresponds to DSR Phase 1 (Artefact Design). DSR Phase 2 (Evaluation), comprising expert panel validation, policy simulation, and stakeholder testing, has not been conducted and represents a necessary next step. Accordingly, the model's financial parameters (yield reductions, leverage ratios, income uplifts) are illustrative benchmarks derived from analogous blended finance structures (Convergence, 2020; OECD, 2018), not actuarially validated figures. Future research should conduct DSR Phase 2 through structured expert interviews with OJK, BWI, and DSN-MUI practitioners and a regulatory sandbox pilot.

4. Result and Discussion

Empirical Landscape: *Green Sukuk* and *Waqf* in Indonesia (2019–2023)

Before presenting the conceptual model, mapping the empirical landscape that motivates its design is essential. Table 4 presents Indonesia's green sukuk issuance trajectory (2018–2023), distinguishing annual issuances from cumulative totals.

Table 4. Indonesia *Green Sukuk* Annual and Cumulative Issuance (2018–2023)

Year	Issuance Type	Annual Amount (IDR Trillion)	Cumulative (IDR Trillion)	Primary Allocation
2018	Sovereign (USD)	17.6	17.6	Renewable Energy & Climate Adaptation
2019	Sovereign + Retail	21.3	38.9	Sustainable Transport & Green Buildings
2020	Sovereign + Retail	11.4	50.3	COVID Green Recovery & Waste Management
2021	Sovereign + Retail	18.9	69.2	Renewable Energy & Resilient Agriculture
2022	Sovereign + Corporate	26.1	95.3	Sustainable Agriculture & Blue Economy
2023	Sovereign + Corporate + SDGs	84.7	180.0	Agriculture, Fisheries & Green Infrastructure

Source: DJPPR, 2023; OJK, 2023; Kementerian Keuangan RI, 2023

While Table 4 illustrates the rapid expansion of Indonesia's green sukuk market during 2018–2023, Table 5 complements this discussion by presenting the development of national waqf mobilization over a similar period. Together, both tables provide an empirical overview of the two Islamic financial instruments that form the foundation of the proposed MBIP model, highlighting their respective growth trajectories, institutional characteristics, and existing structural limitations. Table 5 presents the national *waqf* mobilization status across the same period.

Table 5. National *Waqf* Mobilization Status (2019–2023)

Indicator	2019	2020	2021	2022	2023
Estimated Annual *Waqf* Potential (IDR Trillion)	177	178	179	179.5	180
Actual Cash *Waqf* Collected (IDR Trillion)	0.39	0.52	0.68	0.85	1.21

Collection as % of Annual Potential	0.22%	0.29%	0.38%	0.47%	0.67%
Active *Digital Waqf* Platforms	12	18	27	34	41
Active Productive *Waqf* Projects	62	89	114	143	178
Registered *Nazhir* Institutions (BWI)	218	226	231	238	247

Source: BWI Annual Reports, 2019–2023

The data in Tables 4 and 5 reveal a critical paradox: Indonesia's *green sukuk* program has grown from IDR 17.6 trillion annually in 2018 to IDR 84.7 trillion in 2023 (cumulative IDR 180 trillion), while *waqf* mobilization, despite a theoretical annual potential of IDR 180 trillion, captures less than 0.67% of that potential even in the most recent year. More significantly, both instruments partially target the same sectors (agriculture, fisheries, rural green infrastructure) yet operate through entirely separate regulatory, institutional, and investor ecosystems. This structural misalignment represents the fundamental problem the MBIP model addresses. This growth trajectory is not incidental. The 2021 entry of corporate *sukuk* issuers directly followed Bank Indonesia's Green Taxonomy Framework (2021), demonstrating that regulatory signalling is a primary driver of instrument adoption. Conversely, *waqf* mobilization stagnation reflects structural rather than attitudinal constraints: Badan Wakaf Indonesia (2022) cites *nazhir* capacity deficits, absence of standardized digital reporting, and the lack of a *sukuk–waqf* regulatory bridge as the three principal barriers. Neither instrument's trajectory in isolation is sufficient to address the IDR 476 trillion financing gap in Table 6, the structural argument that motivates the MBIP model's integrated design.

Table 6. Annual Financing Gap in Indonesia's Agriculture and Fisheries Sectors (2023)

Sector	Annual Financing Need (IDR Trillion)	Bank Credit Coverage (IDR T)	Financing Gap (IDR T)	Gap % Unfunded	Key Sources
Agriculture (smallholder)	280	46	234	83.6%	Kementan, 2023; OJK, 2023
Fisheries & Aquaculture	95	12	83	87.4%	KKP, 2023; OJK, 2023
Agri-processing (rural SMEs)	65	18	47	72.3%	Bank Indonesia, 2023
Rural green infrastructure	120	8	112	93.3%	Kementan, 2023
TOTAL	560	84	476	85.0%	Authors' calculation

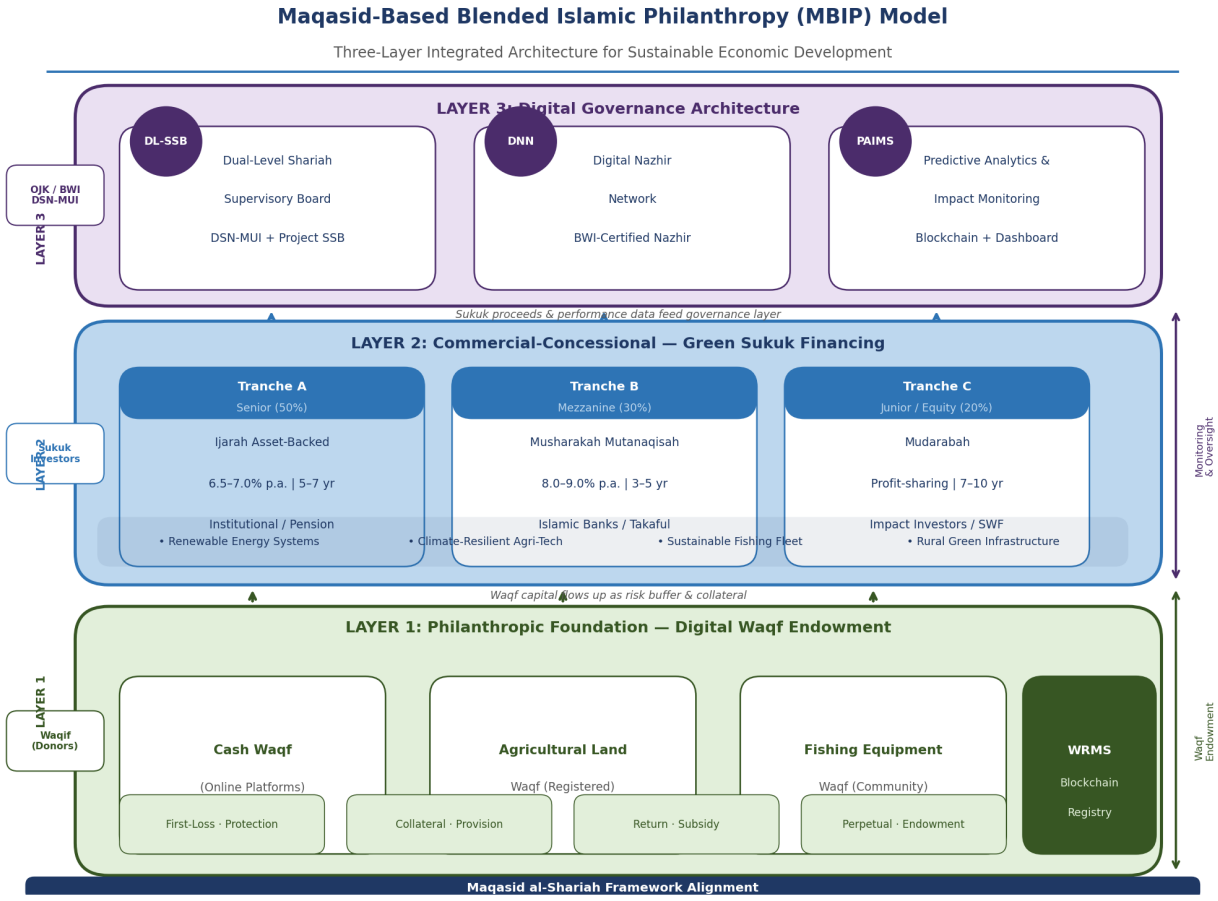
Note: Financing needs estimated from sector development plans; bank credit coverage from OJK sector credit outstanding data.

Table 6 reveals a total sectoral financing gap of approximately IDR 476 trillion annually—2.6 times the entire cumulative *green sukuk* program to date, and 264 times annual *waqf* collections. This underscores that neither instrument alone, nor their current siloed deployment, can address Indonesia's rural financing deficit. The MBIP model proposes a structural solution to this multi-layered gap. Three methodological clarifications are warranted regarding Table 6. First,

the 'Estimated Annual Sector Financing Need' figures represent government development plan projections (Kementerian Keuangan Republik Indonesia, 2025; Kementerian Kelautan dan Perikanan, 2023), the 'investment required to achieve RPJMN targets' as estimated by the respective ministries, not actualized budgetary expenditures. Second, OJK-reported formal bank credit figures are actual outstanding balances as of December 2023, making the gap estimate conservative as it excludes informal credit. Third, a sensitivity analysis indicates that if financing need projections are reduced by 15%, the gap narrows to approximately IDR 405 trillion, still substantially exceeding the combined *green sukuk* and *waqf* mobilization capacity under the status quo.

The *Maqasid*-Based Blended Islamic Philanthropy (MBIP) Model

The MBIP model is a three-layer blended capital architecture that integrates *green sukuk* as the commercial-concessional tranche and *digital waqf* as the philanthropic-perpetual foundation, coordinated through a digital governance superstructure. The model is designed for deployment in Indonesia's agriculture and fisheries sectors, calibrated to satisfy all five *Maqasid al-Shariah* objectives, and governed under a framework consistent with OJK regulations, DSN-MUI *fatwa* standards, and BWI governance protocols. Figure 1 presents the full structural architecture. Reading Figure 1: The diagram is interpreted as follows. (Step 1) Layer 1 (base): *digital waqf* assets flow from *waqif* donors through BWI-registered platforms into the WRMS blockchain registry, forming the first-loss buffer. (Step 2) Layer 1 capital unlocks Layer 2: the first-loss protection reduces commercial tranche risk, enabling *green sukuk* issuance at concessional yields; left-side arrows show capital mobilization into sector projects. (Step 3) Layer 3 (top): DL-SSB provides *Shariah* oversight; DNN connects certified *nazhir*; PAIMS tracks impact in real time. (Step 4) Right-side arrows show feedback loops: PAIMS impact reports flow back to investors and *waqif*, enabling performance-based *waqf* replenishment. The five *Maqasid* objectives on the far right represent the normative evaluation layer across all tiers.



Source: Authors' construct, 2026

Figure 1. *Maqasid*-Based Blended Islamic Philanthropy (MBIP) Model: Three-Layer Integrated Architecture

Layer 1 – Philanthropic Foundation: Digital *Waqf* Endowment

The base layer consists of *digital waqf* assets accumulated through BWI-registered online platforms and blockchain-registered *nazhir* networks. These assets, primarily cash *waqf*, agricultural land *waqf*, and fishing equipment *waqf*, serve four critical functions in the blended structure: (1) first-loss protection for green *sukuk* investors, reducing perceived risk and enabling lower *sukuk* yields by an estimated 1.5–2.0 percentage points; (2) collateral provision for farmer and fisher credit facilities within the *sukuk* SPV structure; (3) return subsidization enabling concessional financing rates viable for smallholders; and (4) permanent asset endowment ensuring productive assets (irrigation systems, cold storage, fishing boats) remain community property across generations—directly embodying *hifz al-nasl*. The estimated yield reduction of 1.5–2.0 percentage points attributable to the *waqf* first-loss buffer is derived from analogous blended finance structures documented by Convergence (2020), where philanthropic first-loss tranches of 15–25% have been empirically observed to reduce commercial tranche yields by 1.2–2.4 percentage points across 47 blended transactions in emerging markets. This is an illustrative benchmark, not an actuarially validated figure for Indonesian conditions. The 5:1 leverage assumption is drawn from blended finance leverage ratios for philanthropy-backed green

instruments (observed range: 4:1–7:1), with 5:1 representing a conservative central estimate pending Indonesian pilot data.

Digital governance is implemented through a blockchain-based *Waqf* Registry and Monitoring System (WRMS), recording all *waqf* asset registrations, fund flows, and beneficiary outcomes on an immutable distributed ledger. Smart contracts automate benefit distribution upon verified performance milestones, reducing administrative leakage and addressing the chronic trust deficit in *waqf* management documented by Saiti et al. (2018) and Badan Wakaf Indonesia (2022).

Layer 2 – Commercial-Concessional: *Green Sukuk* Financing

The middle layer structures *green sukuk* using *Ijarah* (lease) and *Musharakah Mutanaqisah* (diminishing partnership) contracts, calibrated to agriculture and fisheries asset classes. Three *sukuk* sub-tranches are designed with differentiated risk-return profiles (Table 7):

Table 7. Green Sukuk Tranche Structure in the MBIP Model

Tranche	Akad Structure	Target Investors	Yield Target	Tenor	Waqf Enhancement Mechanism
A – Senior (50%)	*Ijarah Asset*-Backed	Institutional / Pension Funds	6.5–7.0% p.a.	5–7 years	First-loss guarantee: 20% waqf cash buffer
B – Mezzanine (30%)	*Musharakah Mutanaqisah*	Islamic Banks / *Takaful*	8.0–9.0% p.a.	3–5 years	Return top-up from waqf usufruct distributions
C – Junior / Equity (20%)	*Mudarabah*	Impact Investors / SWF	Profit-sharing	7–10 years	Collateral from registered waqf land assets

Source: Authors' construct, 2026

Each project undergoes dual verification: *Shariah* compliance review by the DL-SSB and green certification aligned with ICMA Green Bond Principles adapted for *sukuk* by the Climate Bonds Initiative and ACMF's ASEAN Green Bond Standards. Use of proceeds is earmarked for: (1) renewable energy systems for agricultural processing; (2) climate-resilient seed and aquaculture technology; (3) sustainable fishing fleet modernization; and (4) rural logistics and market connectivity infrastructure. The yield parameters in Table 7 are benchmarked as follows. Tranche A (6.5–7.0% p.a.) is calibrated against Indonesia's sovereign *green sukuk* FR series yields (DJPPR, 2023: 6.3–7.1% for 5-year tenors), adjusted upward by 25–30 basis points for MSME-linked structure risk premium. Tranche B (8.0–9.0% p.a.) is benchmarked against OJK-reported *Musharakah Mutanaqisah* financing rates for rural SMEs (OJK, 2023: 7.5–9.0%). Tranche C (profit-sharing) reflects impact investor return expectations for ASEAN blended finance equity instruments (Convergence, 2020: 8.5–12.0% for junior tranches). These are market-informed illustrative benchmarks; actual yields are subject to OJK approval, DSN-MUI review, and prevailing market conditions.

Layer 3 – Digital Governance Architecture

The governance layer is the keystone of the MBIP model, bridging the *waqf* foundation and *sukuk* superstructure through three interlocking mechanisms:

(a) Dual-Level *Shariah* Supervisory Board (DL-SSB): A two-tiered SSB where the national tier (DSN-MUI level) provides *fatwa* on novel structuring questions, while the project tier includes *Shariah* officers embedded within each *nazhir* institution, ensuring field-level compliance; (b) Digital *Nazhir* Network (DNN): A curated network of BWI-certified *nazhir* institutions equipped with digital financial management tools, impact reporting dashboards, and direct API integration with *green sukuk* SPV accounting systems. The DNN enables automated fund routing, reconciliation, and regulatory reporting to OJK and BWI simultaneously; (c) Predictive Analytics and Impact Monitoring System (PAIMS): A data analytics platform tracking agricultural yield improvements, fishery catch sustainability metrics, beneficiary income changes, women's economic participation rates, and carbon emission reductions. PAIMS outputs feed into *sukuk* performance covenants, creating an accountability loop between financial returns and developmental outcomes.

Maqasid al-Shariah Mapping of the MBIP Model

Table 8. *Maqasid al-Shariah* Mapping of the MBIP Model

Maqasid Objective	Arabic Term	MBIP Component	Mechanism	SDG Alignment
Preservation of Wealth	*Hifz al-Mal*	*Green sukuk* + *Waqf* Endowment	Productive deployment of idle waqf & capital market mobilization to close IDR 476T gap	SDG 8, 10, 17
Preservation of Progeny	*Hifz al-Nasl*	Perpetual *Waqf* Assets	Intergenerational community asset endowment (land, equipment) ensuring future livelihood continuity	SDG 2, 1
Preservation of Life	*Hifz al-Nafs*	Agricultural & Fisheries Investment	Food security, nutrition outcomes, disaster-resilient livelihoods for 2.8M fishing households	SDG 2, 3, 13
Preservation of Intellect	*Hifz al-'Aql*	DNN + PAIMS	Nazhir capacity building, farmer financial literacy, data-driven community decisions	SDG 4, 9
Preservation of Faith	*Hifz al-Din*	Dual-Level SSB	Continuous *Shariah* compliance, halal investment standards across entire capital stack	SDG 16

Source: Authors' construct, 2026

This mapping demonstrates that the MBIP model is not merely a financial engineering exercise but a normatively grounded framework addressing the full spectrum of human flourishing as defined by Islamic jurisprudence. Critically, *hifz al-mal* is operationalized through both directions: deploying idle *waqf* assets productively (addressing the philanthropy utilization problem) and mobilizing commercial *green sukuk* capital at scale (addressing the financing gap problem)—a dual-directional wealth preservation that no existing model has articulated in integrated form. To operationalize this mapping empirically, measurable indicators are proposed for each objective: (1) *Hifz al-Mal*: *waqf* mobilization rate (% of IDR 180 trillion potential); *sukuk*

non-performing rate (<2% target); financing gap closure ratio. (2) *Hifz al-Nasl*: cumulative *waqf* land registered (hectares); dependent household beneficiaries; child food security improvement (SUSENAS indicator). (3) *Hifz al-Nafs*: direct beneficiary households; income change at 3-year follow-up; SDG 2 sub-indicator scores in target districts. (4) *Hifz al-ʿAql*: *nazhir* institutions completing PAIMS digital training; farmer financial literacy scores (pre/post); data-driven community decisions documented. (5) *Hifz al-Din*: DL-SSB *Shariah* compliance audit pass rate (target: 100%); DSN-MUI *fatwa* citations per transaction; beneficiary halal compliance perception (Likert scale community survey). These indicators are consistent with and enable empirical testing of the four propositions in Section 4.4.

Research Propositions

Based on the MBIP model's theoretical architecture and the empirical evidence in Sections 4.1–4.3, the following propositions are advanced for future empirical testing. Each is explicitly derived: P1 and P2 are grounded in the financing gap evidence (Table 6: IDR 476T gap) and the risk-return logic of the tranche structure (Table 7); P3 is derived from the *Maqasid* mapping (Table 8) and proposed indicators; P4 is grounded in the PAIMS governance architecture (Section 4.2.3) and *nazhir* capacity constraints documented in Badan Wakaf Indonesia (2022). These propositions bridge the conceptual model to future field-based validation.

Proposition 1 (P1): The integration of *digital waqf* as a first-loss tranche within a *green sukuk* structure reduces the yield required by senior commercial tranche investors by a range of 1.5–2.0 percentage points, thereby improving the viability of financing for agriculture and fisheries MSMEs that would otherwise be priced out of formal capital markets. (Grounded in: Table 6 financing gap + Table 7 tranche structure + Convergence (2020) empirical analogy.)

Proposition 2 (P2): Governance structures incorporating a Dual-Level *Shariah* Supervisory Board (DL-SSB) and blockchain-enabled impact monitoring (PAIMS) are positively associated with *sukuk* investor confidence, measured by lower yield premium demands and higher institutional subscription rates, relative to conventional SSB-only governance in standalone *green sukuk* structures. (Grounded in: Table 7 yield benchmarks + DL-SSB architecture + transparency findings + Azmi et al., 2022)

Proposition 3 (P3): The MBIP model's five *Maqasid*-based impact metrics—operationalized through the measurable indicators proposed in Section 4.3- provide a more comprehensive and *Shariah*-aligned performance assessment framework than standalone SDG-based or ESG frameworks, as measured by the breadth of objectives covered and alignment with DSN-MUI and AAOIFI *Shariah* compliance standards. (Grounded in: Table 8, Maqasid mapping + Section 4.3 indicators + Dusuki & Bouheraoua, 2011).

Proposition 4 (P4): *Nazhir* institutions equipped with PAIMS-compatible digital reporting tools, structured training programs via the Digital *Nazhir* Network (DNN), and access to standardized *waqf* performance benchmarks demonstrate significantly higher *waqf* mobilization rates (measured as % of estimated potential) than *Nazhir* institutions operating under conventional manual reporting systems. (Grounded in: Table 2 *waqf* mobilization stagnation data + Badan Wakaf Indonesia (2022) capacity constraints + DNN architecture.)

Illustrative Application: MBIP in Indonesia's Fisheries Sector

To ground the model in a practical context, we present an illustrative application in Indonesia's small-scale coastal fisheries sector (Kementerian Kelautan dan Perikanan, 2023). The scenario demonstrates MBIP implementation for a coastal community cooperative in Makassar, South Sulawesi. Methodological note: All financial projections, yield figures, income uplift estimates, and beneficiary numbers in Table 9 are hypothetical simulation parameters for illustrative purposes only. They are NOT empirical results or actuarial projections. Specifically: (a) the projected 35–45% household income increase is an illustrative scenario derived from analogous ASEAN fisheries value-chain World Bank programs (World Bank, 2023), not a measured outcome; (b) total financing of IDR 85 billion is a stylized example; (c) carbon estimates are illustrative proxies. The purpose is to demonstrate the MBIP model's structural mechanics—not to assert empirical effectiveness prior to pilot implementation.

Table 9. Illustrative MBIP Application: Sulawesi Blue Economy *Waqf-Sukuk* Initiative

Component	Specification	Value / Detail
Project Name	Sulawesi Blue Economy *Waqf-Sukuk* Initiative	Pilot: Makassar Coastal District
Total Financing Requirement	Fishing vessel modernization + cold storage + solar processing facility	IDR 85 billion
Green *Sukuk* Tranche A (50%)	*Ijarah*-backed, OJK-registered, 6.8% p.a., 6-year tenor	IDR 42.5 billion
Green *Sukuk* Tranche B (30%)	*Musharakah Mutanaqisah, takaful*-subscribed, 8.5% p.a.	IDR 25.5 billion
Digital *Waqf* Layer (20%)	Cash *waqf* + fishing boat *waqf* endowment (WRMS-registered)	IDR 17 billion
***Waqf* First-Loss Buffer**	Covers up to 18% project default risk (Tranche A protection)	IDR 15.3 billion
Direct Beneficiary Households	Fishing families in Makassar coastal cooperative	800 households
Indirect Beneficiaries	Community members, supply chain participants	3,200 persons
Projected Household Income Increase	Value-chain integration + cold storage access	35–45% within 3 years
Estimated Carbon Reduction	Solar facility + reduced diesel fuel (solar-electric vessels)	1,200 tCO_2e/year
Yield Reduction Due to *Waqf* Buffer	First-loss protection effect on Tranche A	1.7 pp reduction
SDG Impact Coverage	SDG 1, 2, 7, 8, 13, 14 (Life Below Water)	Multi-SDG

Source: Authors' construct, 2026; KKP, 2023; OJK, 2023

Comparative Analysis with Existing Instruments

Table 10 presents a comparative analysis of the MBIP model against conventional green sukuk and standalone digital waqf across nine critical dimensions to illustrate the structural advantages of the proposed integrated architecture.

Table 10. Comparative Analysis: MBIP vs. Existing Instruments

Dimension	Conventional *Green Sukuk*	Standalone Digital *Waqf*	MBIP Model (Proposed)
Capital Source	Commercial investors only	Philanthropic donors only	Blended: commercial + philanthropic

Dimension	Conventional *Green Sukuk*	Standalone Digital *Waqf*	MBIP Model (Proposed)
Governance	OJK/capital market rules	BWI *nazhir* framework	Dual-level SSB + DNN integration
Asset Permanence	Temporary (project tenor)	Perpetual (waqf principle)	Hybrid: sukuk exits, waqf remains
Technology Integration	Limited (prospectus-based)	Growing (online platforms)	Full: blockchain WRMS + PAIMS + API
Maqasid Alignment	Partial (*hifz al-mal* only)	Partial (*hifz al-nasl, nafs*)	Comprehensive (all five objectives)
Shariah Risk Management	SSB at issuance only	Nazhir-level compliance	Continuous DL-SSB oversight
Scalability	High (capital market access)	Limited (donor dependency)	High (systemic integration)
SDG Reporting	Allocation-based only	Output-based only	Outcome-based (PAIMS)
Financing Gap Coverage	Project-by-project	Community-by-community	Sector-level structural solution

Source: Authors' construct (2026)

Policy Implications

For OJK (Otoritas Jasa Keuangan): A regulatory sandbox for *Waqf*-Linked *Sukuk* should be established, enabling pilot MBIP structures under temporary regulatory relief while impact data is collected. OJK's existing green taxonomy framework (POJK No. 51/POJK.03/2017) should be updated to include *waqf*-blended instruments as a distinct asset class with dedicated disclosure standards compatible with ACMF ASEAN Green Bond Standards. Feasibility: A regulatory sandbox is technically feasible under OJK's existing POJK No. 57/2020 (regulatory sandbox for financial innovation). The primary risk is jurisdictional: OJK's mandate covers capital markets while BWI covers *waqf* administration. A joint OJK–BWI Memorandum of Understanding analogous to the OJK–BI MoU on Islamic finance supervision (2022) is the necessary precondition, estimated at 12–18 months to negotiate.

For Badan Wakaf Indonesia (BWI): BWI should mandate PAIMS-compatible digital reporting as a condition for *nazhir* license renewal under PP No. 25/2018. BWI should partner with OJK to co-develop the WRMS blockchain infrastructure and establish a Digital *Nazhir* Certification Program with standardized competency benchmarks for participating *nazhir* institutions.

For DSN-MUI: A dedicated *fatwa* on *Sukuk Mawquf* (Waqf-Linked Sukuk) is urgently needed, addressing: (i) the permissibility of *waqf* assets serving as *sukuk* collateral under the irrevocability principle of *waqf;* (ii) the treatment of *sukuk* periodic distributions channeled as *waqf usufruct*; and (iii) profit-sharing arrangements between *sukuk* investors and *waqf* beneficiaries under *mudarabah* and *musharakah* structures. Feasibility: A DSN-MUI *fatwa* on *Sukuk Mawquf* is the highest-priority regulatory prerequisite. DSN-MUI has precedent for compound instrument *fatwas* (e.g., Fatwa No. 32/2002 on sukuk; Fatwa No. 99/2015 on *waqf* of sukuk proceeds). The main scholarly debate concerns the permissibility of *waqf* assets serving as first-loss credit enhancement—a position consistent with the *Shafiʿi* school's approach to *waqf usufruct* flexibility,

though *Hanafi* scholars may require additional conditions. This study's authors recommend that DSN-MUI commission a comparative *fiqh* study as the first step.

For Kementerian Keuangan / DJPPR: The Government's *green sukuk* program should incorporate a *Waqf* Allocation Window—a designated tranche of sovereign *green sukuk* proceeds channeled to MBIP structures in priority sectors—analogous to how SDGs *Sukuk* already maintains thematic allocation categories. A 5% *Waqf* Allocation Window in annual sovereign issuances would mobilize approximately IDR 4.2 trillion annually based on 2023 issuance volumes, catalyzing potentially IDR 21 trillion in blended capital under a 5:1 leverage assumption.

5. Conclusions

This study proposes the *Maqasid*-Based Blended Islamic Philanthropy (MBIP) Model as an integrated framework for linking *green sukuk* and *digital waqf* to support sustainable economic development in Indonesia. The findings indicate a structural imbalance between the rapid growth of Indonesia's *green sukuk* market and the still underutilized potential of *waqf* mobilization, particularly in addressing financing constraints in the agriculture and fisheries sectors. The study demonstrates that the existing separation between philanthropic and commercial Islamic finance instruments limits their collective developmental impact and reinforces the need for a blended institutional approach.

The proposed MBIP model offers a three-layer architecture consisting of *digital waqf* as a philanthropic foundation, *green sukuk* as a commercial-concessional financing mechanism, and a digital governance system integrating DL-SSB, DNN, and PAIMS. Through this structure, the model is designed to enhance financing accessibility, strengthen governance transparency, and support long-term community asset sustainability. In addition, the model operationalizes the five objectives of *Maqasid al-Shariah* into measurable dimensions, positioning Islamic finance not only as a source of funding but also as a normative framework for inclusive and sustainable development.

This study also provides practical implications for regulators and Islamic finance institutions in Indonesia. OJK, BWI, and DSN-MUI are encouraged to strengthen institutional coordination, develop a regulatory framework for waqf-linked *sukuk*, and expand digital governance infrastructure to support integrated Islamic social finance instruments. Although the MBIP model remains conceptual and requires further empirical validation, the study contributes a theoretically grounded and policy-relevant framework that may serve as a foundation for future implementation and research in Islamic sustainable finance.

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