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Green Sukuk and Sustainable Finance: A Legal and Shariah Analysis of Islamic Capital Frameworks

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Abstract

Objective: This study examines the legal, Shariah, and economic dimensions of green Sukuk as instruments of sustainable finance within the global Islamic capital market and evaluates their role in supporting environmental and developmental objectives. **Theoretical framework:** The analysis is grounded in Maqasid Al-Shariah, classical Islamic jurisprudence, and contemporary theories of sustainable finance, emphasising the relationship between Islamic economic law and environmental stewardship. **Literature review:** Existing scholarship on Islamic finance, green bonds, and sustainable development is reviewed to assess the doctrinal foundations, regulatory frameworks, and practical applications of green Sukuk across different jurisdictions. **Methods:** The study adopts a qualitative doctrinal approach combined with comparative legal analysis and an examination of empirical data concerning green Sukuk issuances between 2020 and 2025. **Results:** The findings demonstrate that Islamic economic law possesses an inherent normative structure that is highly compatible with sustainable finance principles. Green Sukuk provide an effective mechanism for financing renewable energy, climate action, and sustainable infrastructure while advancing the objectives of the United Nations Sustainable Development Goals. **Implications:** The study highlights the need for greater harmonisation between Shariah governance mechanisms and international green finance standards to facilitate wider market adoption and regulatory consistency. **Novelty:** The research provides an integrated legal and Shariah analysis of emerging green Sukuk frameworks and offers practical recommendations to enhance their contribution to economic justice and environmental sustainability.

Keywords: green sukuk, islamic finance, shariah governance, capital market, *esg*.

INTRODUCTION

The global financial system stands at a critical crossroads where the imperatives of economic development intersect with the existential urgency of environmental sustainability. Against this backdrop, Islamic finance, a system of financial intermediation grounded in the ethical and legal principles of Islamic law (Shariah), has demonstrated remarkable resilience and adaptability [1]. The global Islamic finance industry has grown from a modest niche in the 1970s into a comprehensive financial ecosystem that encompasses banking, capital markets, insurance (Takaful), and asset management, with total assets surpassing USD 6.3 trillion by 2025. Within this expansive landscape, the emergence of green Sukuk as a distinctive asset class represents not merely a product innovation but a profound statement about the capacity of Islamic economic law to respond to contemporary global challenges [2].

Sukuk, often described as Islamic bonds, though the term is technically imprecise, are Shariah-compliant financial certificates that represent proportional ownership interests in underlying tangible assets, usufructs, or services. Unlike conventional bonds, which embody pure debt obligations and generate returns through pre-determined interest payments, Sukuk generate returns through profit-sharing, leasing, or trade-based arrangements that comply with the Islamic prohibition on Riba (interest). The introduction of the 'green' designation to Sukuk issuances adds a layer of compliance, requiring that the underlying projects or assets financed through the instrument satisfy recognised environmental and sustainability criteria [3].

The legal and Shariah complexity inherent in green Sukuk arises from the dual compliance requirements imposed on issuers, structurers, and Shariah Supervisory Boards (SSBs): the instrument must simultaneously satisfy the substantive requirements of Islamic jurisprudence and the procedural and disclosure requirements of recognized green finance standards, such as the International Capital Market Association (ICMA) Green Bond Principles, the Climate Bonds Standard, or emerging national green taxonomies. This dual compliance framework introduces novel legal questions regarding the hierarchy of norms, the role of Shariah governance in certification processes, the enforceability of green use-of-proceeds covenants, and the potential liability arising from misrepresentation or greenwashing [4].

Despite the remarkable expansion of the global green Sukuk market, which increased significantly from approximately USD 3.2 billion in 2020 to around USD 35.1 billion in 2025, scholarly research examining the relationship between Islamic legal principles and sustainable finance remains relatively limited. Existing studies have largely focused on financial performance, market development, and investment potential, while insufficient attention has been given to the underlying Sharia foundations that support sustainability-oriented financial instruments. This gap highlights the need for more comprehensive research exploring how Islamic jurisprudence, ethical values, and Maqasid al-Sharia can contribute to the theoretical and practical development of green Sukuk frameworks [5]. Existing scholarship tends to treat these as parallel rather than convergent domains, with Islamic finance scholars focusing on Shariah compliance mechanics while environmental finance researchers concentrate on green taxonomies and impact measurement. This paper seeks to bridge this scholarly gap by providing an integrated legal analysis that treats Islamic economic law and sustainable finance not as competing frameworks requiring reconciliation but as complementary jurisprudential traditions sharing deep normative foundations in the concepts of stewardship (Khilafah), justice (Adalah), and the preservation of the natural order (Hifz al-Bi'ah) [6].

The remainder of this paper is structured as follows. Section 2 provides a comprehensive review of the existing literature on Islamic finance, green finance, and their intersection. Section 3 elaborates on the research methodology and analytical framework adopted in this study. Section 4 presents the doctrinal analysis of the Shariah foundations for sustainable finance. Section 5 examines the structural mechanics and regulatory landscape of green Sukuk. Section 6 provides a comparative analysis of key jurisdictional frameworks. Section 7 presents the findings and discussion, including empirical data on green Sukuk market trends. Section 8

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addresses principal challenges and reform recommendations. Section 9 concludes the paper.

LITERATURE REVIEW

Islamic Economic Law: Foundational Principles and Contemporary Relevance

Islamic economic law constitutes a comprehensive normative framework governing the production, distribution, and consumption of wealth in accordance with divine guidance as expressed in the primary sources of Islamic jurisprudence the Quran and the authenticated traditions of the Prophet Muhammad (Sunnah) as well as through the secondary sources of analogical reasoning (Qiyas), scholarly consensus (Ijma), and public interest (Maslaha) [7]. The classical jurists of the major Sunni and Shia legal schools elaborated an intricate body of commercial law (Fiqh Al-Muamalat) that addressed contracts, property rights, market regulation, and the obligations of economic actors with remarkable sophistication. Contemporary scholars have engaged extensively with the question of whether and how this classical jurisprudential heritage can be applied to the exigencies of modern financial markets [8].

The foundational prohibitions of Islamic economic law Riba (interest or usury), Gharar (excessive uncertainty or ambiguity in contracts), Maysir (gambling or speculative transactions), and investment in industries deemed impermissible (Haram) serve not merely as formal legal constraints but as expressions of a broader moral economy oriented toward the equitable distribution of risk and reward, the protection of the weak from exploitation by the powerful, and the alignment of economic activity with divine purpose [9]. These prohibitions have generated a rich tradition of financial structuring that deploys Shariah-compliant modes of financing, including Murabaha (cost-plus financing), Musharakah (partnership), Mudharabah (profit-sharing), Ijarah (leasing), and Istisna (manufacturing contracts) as substitutes for conventional interest-based instruments [10].

The concept of Maqasid Al-Shariah, developed systematically by the Maliki jurist Abu Ishaq Al-Shatibi in his monumental work Al-Muwafaqat, provides perhaps the most powerful hermeneutical tool for understanding the relationship between Islamic economic law and contemporary sustainability imperatives. Al-Shatibi argued that the objectives of Islamic law are organised hierarchically around the preservation of five essential values: religion (Din), life (Nafs), intellect (Aql), progeny (Nasl), and wealth (Mal). Contemporary scholars have expanded this framework to include the preservation of the natural environment (Hifz al-Bi'ah) as a sixth essential objective, grounding the Islamic legal obligation of environmental stewardship in the same jurisprudential architecture that undergirds the prohibition of Riba [11].

Sukuk: Structure, Evolution, and Contemporary Debates

The academic literature on Sukuk has grown exponentially since the issuance of the first sovereign Sukuk by Malaysia in 2002, reflecting the instrument's rapid market development and the complex Shariah and legal questions it has generated. Early scholarship focused primarily on the permissibility of Sukuk under classical Islamic jurisprudential criteria, with particular attention to the requirement that Sukuk certificates represent genuine ownership interests in tangible assets rather than mere debt claims [12]. The controversy sparked by the 2007 resolution of the Accounting and Auditing Organisation for Islamic Financial Institutions (AAOIFI) criticising the majority of Sukuk structures as non-compliant with Shariah requirements because they incorporated purchase undertakings at face value that effectively converted equity-like returns into guaranteed debt obligations, forced a fundamental reconsideration of market practices and generated a rich body of scholarly debate [13].

Subsequent scholarship has addressed an increasingly diverse range of Sukuk-related legal questions, including the treatment of Sukuk in insolvency proceedings, the recognition of Sukuk structures under English and New York law, the taxation treatment of Sukuk transactions in non-Islamic jurisdictions, and the governance mechanisms for Shariah Supervisory Boards operating within different regulatory environments. A growing body of empirical work has examined the pricing behaviour of Sukuk relative to conventional bonds, the impact of Shariah supervisory board characteristics on Sukuk structure and risk, and the determinants of Sukuk market development across different jurisdictions [14].

Green Finance and the SDG Agenda

The global green finance movement has its origins in the launch of the first labelled green bond by the European Investment Bank in 2007 and the subsequent development of the ICMA Green Bond Principles in 2014. The conceptual framework of green finance has since expanded dramatically to encompass a broad array of financial instruments, including green loans, sustainability-linked bonds, transition finance instruments, and, increasingly, green Sukuk, all oriented toward financing projects with positive environmental outcomes [15]. The emergence of the Sustainable Development Goals in 2015 and the Paris Agreement on climate change have provided a comprehensive normative framework for green finance, establishing measurable targets for environmental improvement and creating powerful incentives for the development of financial mechanisms capable of mobilising the estimated USD 2.5 to 4.8 trillion annually required to achieve the SDGs [16].

The scholarly literature on green finance has increasingly engaged with questions of definition, measurement, and verification of what projects qualify as 'green', how environmental impact is measured and reported, and how investors and regulators can distinguish genuine green finance from 'greenwashing', the practice of misrepresenting the environmental credentials of financial products. The development of green taxonomies, legal classifications of economic activities as environmentally sustainable or otherwise, has emerged as a key regulatory priority, with the European Union's Sustainable Finance Taxonomy Regulation representing the most comprehensive effort to date to establish a legally binding framework for this purpose [17].

The Convergence of Islamic Finance and Sustainable Finance

The scholarly examination of the intersection between Islamic finance and sustainable finance has emerged as a distinct research area over the past decade, though it remains significantly underdeveloped relative to the importance of the phenomena it addresses [18]. Early contributions focused on identifying structural similarities between Islamic finance principles and environmental finance concepts, noting in particular the alignment between the prohibition on investment in harmful industries (including polluting industries) in Islamic law and the negative screening criteria employed in conventional environmental, social, and governance (ESG) investing. More recent scholarship has moved beyond these structural analogies to examine the doctrinal foundations of Islamic environmental ethics, the compatibility of specific Sukuk structures with green finance requirements, and the regulatory challenges of creating dual-compliant financial instruments [19].

A critical gap in the existing literature concerns the legal architecture required to operationalise the convergence of Islamic economic law and green finance at the level

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of regulatory frameworks, contract law, and institutional governance. This paper seeks to address this gap directly, contributing to the scholarly conversation through an integrated legal-doctrinal analysis that examines both the theoretical foundations and the practical implementation of green Sukuk as instruments of sustainable Islamic finance [20].

METHODOLOGY

Research Design and Analytical Approach

This research adopts a qualitative multi-method approach that integrates doctrinal legal analysis, comparative legal methodology, and empirical market analysis. The doctrinal analysis examines primary sources of Islamic law, the Quran, authenticated Hadith collections, classical jurisprudential texts, and contemporary Shariah standard-setting documents to establish the normative framework within which green Sukuk must operate [21]. The comparative legal analysis examines the regulatory frameworks governing green Sukuk in six key jurisdictions: Malaysia, Saudi Arabia, the United Arab Emirates, Indonesia, the United Kingdom, and Hong Kong. The empirical analysis draws upon market data on green Sukuk issuances from 2020 to 2025, supplemented by regulatory documents, Shariah board resolutions, and case studies of significant green Sukuk transactions [22].

Data Sources and Collection

Primary data sources for this research include the published standards of AAOIFI and the Islamic Financial Services Board (IFSB), the guidelines and circulars of key regulatory authorities, including Malaysia's Securities Commission (SC), Saudi Arabia's Capital Market Authority (CMA), the UAE's Securities and Commodities Authority (SCA), and Indonesia's Otoritas Jasa Keuangan (OJK). Green finance standards examined include the ICMA Green Bond Principles, the Climate Bonds Standard, and national green taxonomies where available. Market data on green Sukuk issuances has been drawn from the Climate Bonds Initiative (CBI), Bloomberg Terminal data, and the IIFM Sukuk Database. Qualitative insights have been derived from the published resolutions and fatwas of major Shariah supervisory boards, including AAOIFI's Shariah Board, Malaysia's Shariah Advisory Council (SAC), and Saudi Arabia's National Committee for Shariah Scholars [23].

Analytical Framework

The analytical framework employed in this paper integrates two complementary jurisprudential methodologies: the Maqasid Al-Shariah framework, which provides a teleological approach to Islamic legal analysis oriented toward the higher objectives of Islamic law, and the comparative law methodology of functional equivalents, which identifies functional parallels between Islamic legal institutions and their conventional counterparts without assuming structural identity. This integrated framework enables the paper to move beyond formal compliance analysis to address the deeper question of whether green Sukuk serve the substantive purposes of Islamic economic law, not merely its formal requirements [24].

The study further adopts a comprehensive stakeholder analysis framework to explore the roles, interests, and interactions of key participants within the green Sukuk ecosystem. These stakeholders include sovereign and corporate issuers, institutional and retail investors, Shariah Supervisory Boards, regulatory authorities, rating agencies, and civil society organizations. By examining the objectives, expectations, and concerns of these actors, the research provides a deeper understanding of the mechanisms shaping the development of green Sukuk markets. The stakeholder

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perspective also helps identify areas of cooperation and potential conflicts that may influence market growth and sustainability outcomes. Furthermore, this approach offers valuable insights into the broader political and economic dynamics affecting the adoption of green Sukuk. Through this analysis, the study seeks to highlight the major challenges facing market expansion, including regulatory inconsistencies, limited investor awareness, Shariah governance issues, and the need for greater transparency and standardization in sustainable Islamic finance practices.

RESULTS AND DISCUSSION

Shariah Foundations of Sustainable Finance

1. Environmental Stewardship in Islamic Jurisprudence

The theological and jurisprudential foundations of Islamic environmental ethics are deeply embedded in the primary sources of Islamic law and have been elaborated with increasing sophistication by contemporary Shariah scholars. The Quranic concept of Khilafah, the appointment of humanity as God's vicegerent or steward on earth, establishes a fundamental theological basis for the obligation of environmental stewardship [26]. The Quran explicitly confers upon human beings the role of trustees (Khulafa) of the natural world, a responsibility that entails not merely the right to use natural resources for human benefit but the correlative obligation to preserve and protect these resources for future generations. This concept of intergenerational equity, the obligation to transmit the natural environment intact to succeeding generations, represents a profound point of convergence between Islamic legal theory and the sustainability principles underlying modern environmental law [27].

The classical jurists developed a rich body of doctrines governing the use of natural resources and the prevention of environmental harm. The doctrine of Hima, which reserved lands protected from human exploitation, represents perhaps the earliest form of nature conservation law in any legal tradition, with documented examples from the Prophetic period [28]. The principle of La Darar wa La Dirar (no harm shall be inflicted or reciprocated), derived from a hadith of the Prophet Muhammad, establishes a general prohibition on causing harm to others that has been applied by contemporary scholars to prohibit environmental pollution, resource depletion, and activities contributing to climate change. The concept of Ihya al-Mawat (the revitalisation of dead lands) has been reinterpreted in contemporary jurisprudence to encompass the rehabilitation of degraded ecosystems and the conversion of contaminated land to productive use [29].

2. Maqasid Al-Shariah and the Sixth Objective

The contemporary expansion of the Maqasid Al-Shariah framework to include the preservation of the natural environment as a sixth essential objective (alongside the classical five) represents a significant jurisprudential development with direct implications for Islamic economic law. This expansion, championed by scholars including Yusuf Al-Qaradawi, Ahmad Al-Raysuni, and Jasser Auda, is grounded not in innovation but in the application of classical methodological principles to contemporary realities. The argument proceeds as follows: if the purpose of Islamic law is to promote human well-being (Maslaha) and prevent harm (Mafsada), and if the degradation of the natural environment constitutes one of the most severe harms facing contemporary humanity, then the preservation of the environment must be recognised as an objective of Islamic law of the highest order [30].

This Maqasid-based framework has profound implications for Islamic economic law. It provides a Shariah foundation for positive obligations, not merely the avoidance of environmentally harmful activities, but the affirmative duty to engage in activities that promote environmental sustainability. It legitimises the use of Islamic legal mechanisms, including Sukuk, Waqf, Zakat, and Takaful, as instruments of environmental finance. And it provides a normative basis for imposing liability on economic actors whose activities contribute to environmental degradation, even in the absence of specific Quranic or hadith-based prohibitions addressing the precise form of harm in question [31].

3. Structural Compatibility of Sukuk with Green Finance

The structural characteristics of Sukuk, particularly their requirement of asset-backing and their prohibition on purely speculative or interest-based returns, make them inherently well-suited as instruments of green finance [32]. The requirement that Sukuk represent ownership interests in tangible underlying assets ensures that capital mobilised through green Sukuk issuances is genuinely invested in the identified green projects, rather than flowing into a general pool of corporate funds with a mere notional green designation. This structural feature directly addresses one of the principal criticisms levelled at green bonds in conventional finance markets, the fungibility problem, whereby 'green' proceeds are commingled with general corporate funds, making it impossible to verify that the capital raised is actually deployed in green projects [33].

Table 1. Shariah Compliance Criteria for Green Sukuk Instruments

Criterion	Shariah Basis	Green Finance Equivalent	Compliance Level
Prohibition of Riba (Interest)	Quran 2:275–279	No fixed-return debt structures	Mandatory
Asset-Backing Requirement	Fiqh Al-Muamalat	Tangible green assets (solar, wind)	Mandatory
Prohibition of Gharar (Uncertainty)	Hadith Bukhari	Clear green project identification	Mandatory
Prohibition of Maysir (Speculation)	Quran 5:90	No carbon credit speculation	Mandatory
Maqasid Al-Shariah Alignment	Al-Shatibi's Framework	Environmental preservation (Hifz al-Bi'ah)	Recommended
Social Equity (Adalah)	General Fiqh Principles	Just transition & community benefit	Recommended
Transparency (Amanah)	Prophetic Tradition	Green impact reporting & ESG disclosure	Recommended

Source: Compiled by the author from AAOIFI Standards, IFSB Guidelines, and ICMA Green Bond Principles (2025)w23

As illustrated in Table 1, the core Shariah compliance criteria applicable to green Sukuk instruments map onto green finance requirements in a manner that reinforces rather than complicates the environmental integrity of the instruments. The prohibition on Riba ensures that green Sukuk cannot generate returns through interest-based mechanisms that would be indifferent to the actual performance of the underlying green assets. The Shariah requirement of asset-backing reinforces the green finance principle of project identification and ring-fencing of proceeds. The prohibition on Gharar encourages clear and precise specification of the green projects to be financed, reducing the ambiguity that facilitates greenwashing in conventional green bond markets.

Green Sukuk: Market Development and Structural Analysis

1. Market Growth and Trends

The green Sukuk market has witnessed remarkable expansion since the launch of the first green Sukuk by Tadau Energy, a Malaysian renewable energy company, in 2017. What began as a relatively small and emerging segment of the Islamic capital market has evolved into a rapidly growing financial instrument that supports both sustainable development and Shariah-compliant investment objectives. Over the past several years, increasing global awareness of environmental challenges, climate change mitigation, and sustainable financing needs has contributed significantly to the rising demand for green Sukuk. As a result, governments, financial institutions, and corporate entities have increasingly utilized these instruments to finance environmentally responsible projects. This growth has strengthened the position of green Sukuk within the broader Islamic finance industry and the global sustainable finance landscape. Figure 1 illustrates the growth trend of global Islamic finance assets between 2018 and 2025, providing important background for understanding the economic and financial context that has facilitated the expansion of the green Sukuk market [34].

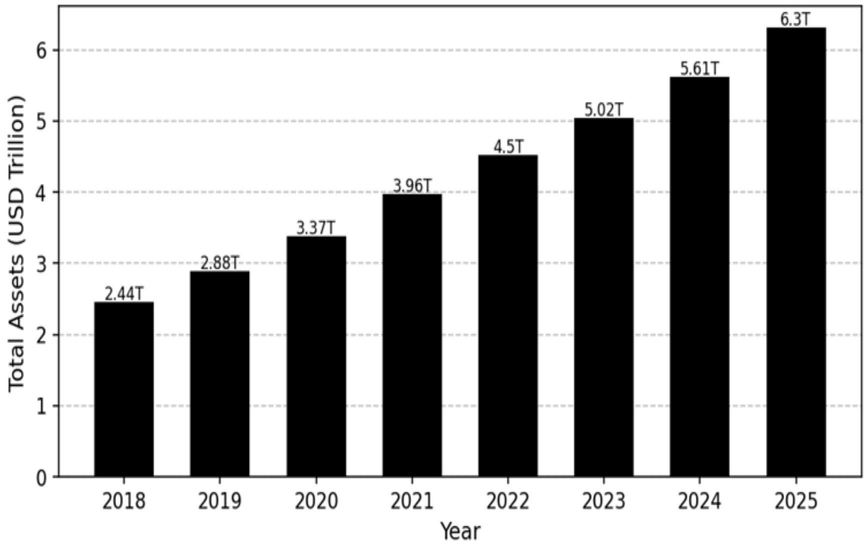

Figure 1: Global Islamic Finance Assets Growth (2018–2025, USD Trillion)

Source: Islamic Financial Services Board (IFSB) Stability Report 2025; Climate Bonds Initiative (CBI) Green Sukuk Report 2025.

As depicted in Figure 1, global Islamic finance assets have grown at a compound annual growth rate (CAGR) of approximately 14.7% over the period 2018 to 2025, reaching USD 6.30 trillion by the end of 2025. This sustained growth trajectory reflects the deepening institutionalisation of Islamic finance across multiple jurisdictions and asset classes, as well as the expanding universe of conventional investors who have come to recognise the risk-adjusted return characteristics and ethical credentials of Shariah-compliant financial instruments [35]. Green Sukuk, while still representing a relatively small proportion of total Islamic capital market issuances, have grown at a substantially higher rate than the broader Islamic finance industry, reflecting the dual tailwinds of expanding Islamic finance markets and accelerating global green finance adoption [36].

Table 2 provides detailed data on global green Sukuk issuances from 2020 to 2025, illustrating the dramatic growth in both the volume and value of issuances over this period.

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Table 2. Global Green Sukuk Issuances (2020–2025)

Year	Number of Issuances	Total Value (USD Billion)	Avg. Maturity (Years)	Top Issuing Country	Primary Sector
2020	14	3.2	7.3	Malaysia	Renewable Energy
2021	22	6.8	8.1	Malaysia	Clean Transport
2022	31	12.4	8.5	Saudi Arabia	Renewable Energy
2023	45	19.7	9.2	Saudi Arabia	Green Buildings
2024	58	27.3	9.8	UAE	Renewable Energy
2025*	72	35.1	10.4	UAE	Mixed Green

*Source: Climate Bonds Initiative Green Sukuk Report 2025; Bloomberg Green Finance Data; IIFM Sukuk Database. *2025 figures are estimated based on year-to-date data and projected full-year issuances.*

The findings presented in Table 2 demonstrate the rapid expansion and increasing maturity of the global green Sukuk market during the period from 2020 to 2025. A key indicator of this development is the substantial rise in the number of issuances, which increased from 14 transactions in 2020 to an estimated 72 transactions by 2025. This growth reflects greater participation by both sovereign and corporate issuers and indicates a stronger capacity within the market to structure instruments that meet both environmental objectives and Shariah requirements. In addition, the total value of green Sukuk issuances grew significantly from approximately USD 3.2 billion to USD 35.1 billion, highlighting the growing confidence of investors in sustainable Islamic financial products. The market's expansion has outperformed many conventional sustainable finance segments, demonstrating its increasing relevance within global capital markets. Another notable trend is the steady increase in average maturity periods, rising from 7.3 years to 10.4 years over the same timeframe. This development suggests enhanced investor trust in the long-term performance of green Sukuk and their suitability for financing infrastructure, renewable energy, and other sustainability-oriented projects requiring extended investment horizons. Overall, these trends confirm the growing importance of green Sukuk as a strategic instrument for promoting sustainable development while adhering to Islamic financial principles [37].

2. Geographic Distribution and Sector Analysis

The geographic distribution of green Sukuk issuances reflects both the historical leadership of Malaysia in developing the Islamic capital market and the increasingly significant role of GCC countries, particularly Saudi Arabia and the UAE, as the region's ambitious Vision 2030 and Net Zero 2050 commitments drive demand for sustainable infrastructure financing. Figure 2 presents the geographic distribution of green Sukuk issuances by percentage share from 2020 to 2025 [38].

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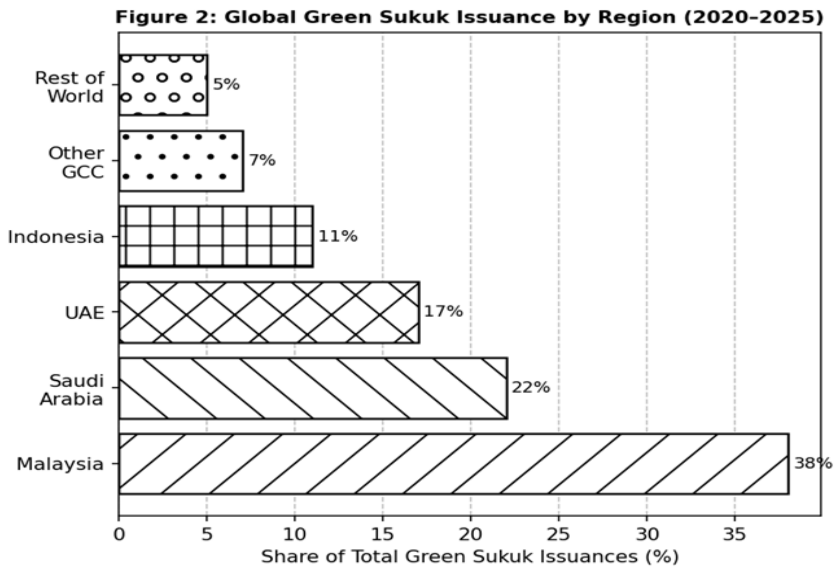

Figure 2. Global Green Sukuk Issuance by Region (Percentage Share, 2020–2025)

Source: Climate Bonds Initiative (CBI) Green Sukuk State of the Market Report 2025.

Figure 2 illustrates that Malaysia remains the dominant issuer of green Sukuk globally, accounting for approximately 38% of all issuances by value over the 2020–2025 period. This leadership position reflects Malaysia's first-mover advantage in developing the regulatory infrastructure for both Islamic capital markets and green finance, including the Securities Commission's SRI (Sustainable and Responsible Investment) Sukuk Framework, which has been progressively enhanced to accommodate international green standards. Saudi Arabia, with a 22% share, has emerged as a significant issuer in recent years, driven by the capital requirements of Vision 2030's renewable energy and sustainable infrastructure programs. The UAE (17%) and Indonesia (11%) complete the picture of the four dominant issuing jurisdictions, with the GCC as a whole (Saudi Arabia plus other GCC countries) accounting for approximately 29% of issuances [39].

The sectoral composition of green Sukuk proceeds reveals a strong concentration in renewable energy projects, particularly solar power installations, which accounted for approximately 45% of total green Sukuk proceeds over the review period. Clean transportation, including electric vehicle infrastructure, metro rail systems, and sustainable aviation fuel projects, constituted the second largest sector at approximately 22%, followed by green buildings (16%), sustainable water management (10%), and other eligible green categories (7%). This sectoral distribution reflects both the substantial capital requirements of renewable energy infrastructure and the Shariah suitability of asset-backed financing structures for these types of long-lived physical assets [40].

3. Structural Mechanics of Green Sukuk

Green Sukuk are structured using the same fundamental Shariah-compliant financing modes as conventional Sukuk, with the addition of a green use-of-proceeds framework and associated reporting obligations. The most commonly employed structures in green Sukuk issuances are Ijarah (lease-based), Musharakah (partnership-based), and Wakala (agency-based) structures, reflecting the asset-intensive nature of most green infrastructure projects and the suitability of these modes for generating returns from the income generated by green assets without recourse to interest [41].

In a typical green Ijarah Sukuk for a solar power project, the issuer (or a special purpose vehicle established for the purpose) sells the solar power installation to the Sukuk holders, who then lease the asset back to the issuer for a lease rental that constitutes the periodic distribution to Sukuk holders. The proceeds of the initial sale are applied exclusively to the identified green project in accordance with the green use-of-proceeds framework, and the issuer commits to periodic reporting on the deployment of proceeds and the environmental impact of the financed project. The Shariah Supervisory Board reviews and certifies the entire structure, both the underlying Sukuk mechanics and the green use-of-proceeds framework to ensure compliance with both dimensions of the dual compliance requirement [42].

Comparative Regulatory Framework Analysis

1. Overview of Key Jurisdictional Approaches

The regulation of green Sukuk spans multiple legal domains: Islamic finance law, securities regulation, environmental law, and international standards, and the interaction among these domains varies significantly across jurisdictions. Table 3 provides a comparative overview of the key regulatory frameworks governing green Sukuk in six major jurisdictions, highlighting differences and commonalities in Shariah governance structures, green standards adoption, and SDG alignment [43].

Table 3. Comparative Analysis of Green Sukuk Regulatory Frameworks

Framework	Jurisdiction	Shariah Governance	Green Standards	SDG Alignment
SC Malaysia Guidelines	Malaysia	AAOIFI + Local SAC	ICMA GBP + National	SDG 7, 13, 15
HKMA Green/Sustainable Finance	Hong Kong	Hybrid	ICMA GBP	SDG 7, 11, 13
AAOIFI FAS 62	Global	AAOIFI Standard	Partial ESG	SDG 13
IFSB-16	Global	Prudential Basis	Risk-based	Limited
Saudi Vision 2030 Green	Saudi Arabia	CMA + Shariah Board	ICMA GBP	SDG 7, 9, 13
UAE Sustainable Finance	UAE	National Shariah Comm.	ICMA GBP + UAE Taxonomy	SDG 7, 11, 13, 17

Source: Compiled by the author from SC Malaysia SRI Sukuk Framework (2025 Edition); AAOIFI Financial Accounting Standard 62; IFSB-16; CMA Saudi Arabia Sukuk Guidelines; UAE SCA Sustainable Finance Framework; HKMA Green and Sustainable Finance Framework.

2. The Malaysian Model: Integrated Shariah-Green Governance

Malaysia's Securities Commission introduced the SRI Sukuk Framework in 2014 and has progressively enhanced it through subsequent amendments, creating what is arguably the world's most sophisticated regulatory infrastructure for dual Shariah-green compliant instruments. The framework mandates that all SRI Sukuk obtain a Shariah pronouncement from a registered Shariah adviser confirming compliance with one of the approved Sukuk structures, as well as an external review from a recognised provider confirming alignment with one of the accepted green standards. The SC has developed a list of eligible green categories specifically calibrated to align with Malaysia's National Green Technology Policy, the ICMA Green Bond Principles, and the Climate Bonds Standard, while accommodating Shariah-specific considerations such as the prohibition on investment in tobacco, alcohol, and gambling industries [44].

A distinctive feature of the Malaysian approach is the SC's collaboration with the central bank (Bank Negara Malaysia) to ensure that the Shariah governance framework for SRI Sukuk is consistent with the broader Shariah governance framework applicable to Islamic

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financial institutions under the Islamic Financial Services Act 2013. This coordinated approach reduces regulatory arbitrage opportunities and ensures that the Shariah supervisory arrangements for green Sukuk issuances meet the same standards of qualification, independence, and disclosure applicable to Shariah governance in Islamic banking [45].

3. The GCC Approach: Vision-Driven Market Development

The green Sukuk markets of Saudi Arabia and the UAE have developed primarily as instruments of national development strategy rather than through the organic development of a comprehensive regulatory framework. In Saudi Arabia, the CMA's Sukuk and Debt Instruments Regulations, supplemented by guidance from the National Committee for Shariah Scholars and the Saudi Green Initiative's sectoral frameworks, provide the principal regulatory basis for green Sukuk issuances. Saudi Aramco's landmark USD 6 billion Sukuk in 2021 and the sovereign green Sukuk issued by the Ministry of Finance in 2022 established important precedents for the market, though the Shariah governance arrangements for these issuances, which relied primarily on ad hoc Shariah board opinions rather than a standardised framework, have been subject to scholarly criticism [46].

The UAE's approach reflects the federal structure of its financial regulatory system, with the SCA, the Central Bank, the ADGM (Abu Dhabi Global Market), and the DIFC (Dubai International Financial Centre) each playing distinct roles in the regulation of green Sukuk. The DIFC, operating under English law, has been particularly active in providing a legal environment that facilitates the issuance of green Sukuk for international investors, with robust disclosure requirements and enforcement mechanisms that complement the Shariah governance arrangements of the issuing entities. The Abu Dhabi Sustainable Finance Declaration, launched in 2023, established a comprehensive framework for sustainable finance across the emirate, including specific provisions for green Sukuk that integrate AAOIFI Shariah standards with international green finance best practices [47].

Discussion

The Doctrinal Compatibility of Green Finance and Islamic Economic Law

The analysis conducted in this paper strongly supports the conclusion that Islamic economic law and green finance principles are not merely compatible but are grounded in complementary normative visions of economic justice and environmental stewardship. The prohibition on Riba, which lies at the heart of Islamic financial practice, expresses a fundamental commitment to the equitable distribution of risk and return that resonates deeply with the green finance objective of aligning financial flows with long-term societal well-being. The Islamic legal concept of Khilafah (stewardship) provides a theological grounding for environmental responsibility that is, if anything, more deeply embedded in the normative foundations of Islamic law than sustainability considerations are in most conventional legal systems.

Figure 3 illustrates the evolution of Shariah governance frameworks adopted by Islamic financial institutions, demonstrating the growing convergence around AAOIFI standards as the primary reference point for Shariah compliance, a development with significant implications for the standardisation of green Sukuk governance.

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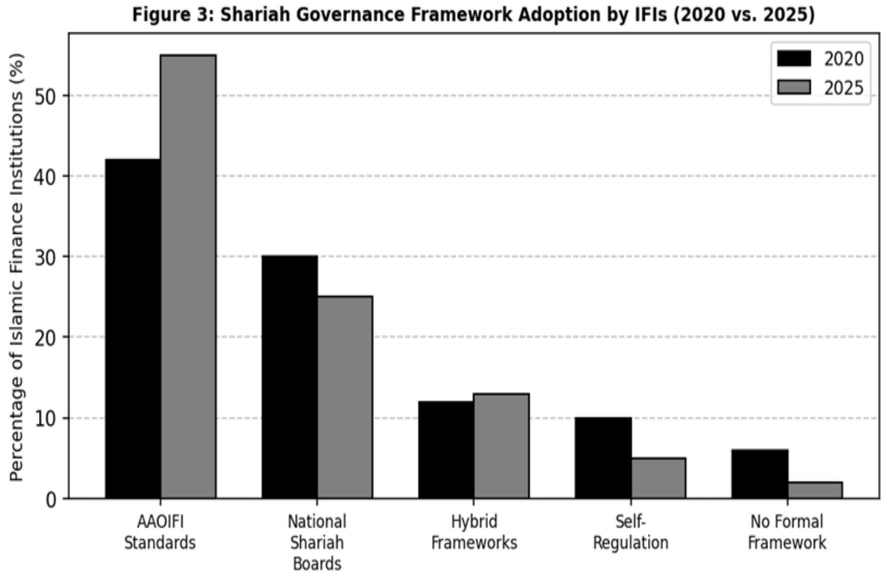

Figure 3. Shariah Governance Framework Adoption by Islamic Financial Institutions (2020 vs. 2025)

Source: Islamic Financial Services Board (IFSB) Islamic Finance Development Report 2025; AAOIFI Annual Survey on Shariah Governance Practices 2025

As Figure 3 demonstrates, the proportion of Islamic financial institutions adopting AAOIFI standards as their primary Shariah governance framework has increased from 42% in 2020 to 55% in 2025, while the share relying on national Shariah boards as their primary reference has declined from 30% to 25%. This convergence toward AAOIFI standards, combined with the growing alignment between AAOIFI's work program and international sustainable finance standards, creates a favourable institutional environment for the development of harmonised green Sukuk governance frameworks. Notably, the proportion of institutions relying on self-regulation, the framework most associated with governance weaknesses and potential Shariah non-compliance, has declined dramatically from 10% to 5%, reflecting the maturation of regulatory oversight across key jurisdictions [48].

Market Performance and Investor Reception

The empirical data on green Sukuk market performance presented in this paper provide strong evidence that these instruments are generating genuine market demand among a diverse investor base that includes Islamic institutional investors, conventional ESG-focused investors, development finance institutions, and sovereign wealth funds. The growth in issuance volumes documented in Table 1 has been accompanied by reports of substantial oversubscription in major green Sukuk transactions, suggesting that demand is outpacing supply in the current market environment. Several landmark transactions — including the Republic of Indonesia's sovereign green Sukuk series, Saudi Aramco's green Sukuk, and Abu Dhabi's sovereign green Sukuk have attracted order books multiple times oversubscribed, with participation from geographically diverse investor bases spanning Asia, the Middle East, Europe, and the Americas [49].

This broad investor participation is significant from a legal and regulatory perspective because it demonstrates that the dual compliance framework of green Sukuk — satisfying both Shariah requirements and green finance standards has not deterred conventional investors who are indifferent to the Shariah dimension but attracted by the green credentials and the structural characteristics of the instruments. The growing participation of conventional ESG investors in green Sukuk markets represents a powerful argument for the mainstreaming of Islamic finance principles in global capital markets and for the development of a unified sustainable finance legal architecture that encompasses both conventional and Islamic instruments [50].

Alignment with Sustainable Development Goals

The analysis of green Sukuk transactions from 2020 to 2025 reveals strong alignment with several of the United Nations Sustainable Development Goals, particularly SDG 7 (Affordable and Clean Energy), SDG 13 (Climate Action), SDG 11 (Sustainable Cities and Communities), and SDG 6 (Clean Water and Sanitation). The renewable energy projects financed through green Sukuk, including solar farms, wind installations, and hydroelectric projects, contribute directly to SDG 7 targets, while the green buildings and sustainable transport projects financed through the instruments contribute to SDGs 11 and 13. The alignment between green Sukuk and the SDGs is not merely incidental but reflects the deliberate structuring of use-of-proceeds frameworks to align with recognised SDG eligibility criteria [51].

From an Islamic legal perspective, the alignment between green Sukuk and the SDGs can be understood through the prism of Maqasid Al-Shariah. SDG 7's objective of universal access to clean energy resonates with the Islamic legal principle of Maslaha Ammah (public interest) and the obligation to ensure that essential goods and services are accessible to all members of society. SDG 13's climate action targets align directly with the Islamic environmental obligation of Hifz al-Bi'ah (preservation of the natural environment). SDG 17's emphasis on partnerships and institutional cooperation resonates with the Islamic legal concept of Ta'awun (mutual assistance and cooperation) as a foundational principle of social organisation. This multi-level alignment between Islamic legal principles and SDG objectives provides a powerful normative basis for Islamic finance institutions to prioritise green Sukuk as instruments of both Shariah compliance and global sustainable development.

Challenges, Limitations, And Reform Recommendations

Principal Challenges

Despite the remarkable progress documented in this paper, the green Sukuk market faces a constellation of legal, regulatory, and market challenges that must be addressed to realise its full potential as an instrument of sustainable Islamic finance. Table 4 presents the principal challenges identified through this research, organised by category, and proposes specific legal and regulatory solutions for each.

Table 4. Principal Challenges and Proposed Legal/Regulatory Solutions

Challenge Category	Specific Challenge	Proposed Legal/Regulatory Solution
Standardization	Divergence between AAOIFI and national Shariah boards on green asset eligibility	Establish a unified international Shariah-green taxonomy through the IFSB-AAOIFI joint committee.
Legal Recognition	Lack of legal enforceability of Shariah Supervisory Board (SSB) rulings in civil courts	Reform commercial codes to recognise SSB certifications as legally binding expert opinions
Greenwashing Risk	Misclassification of projects as 'green' without adequate Shariah-ESG due diligence	Mandate third-party Shariah-ESG audits with criminal liability for misrepresentation

Market Depth	Limited secondary market liquidity for green Sukuk instruments	Create Shariah-compliant green Sukuk repo markets and central clearing mechanisms
Investor Awareness	Insufficient understanding of dual compliance requirements among institutional investors	Develop mandatory ESG-Shariah literacy programs through the central bank's continuing education.

Source: Author's analysis based on regulatory documents, market data, and Shariah governance frameworks reviewed in this study

The Standardisation Challenge

Perhaps the most fundamental challenge facing the green Sukuk market is the absence of a unified international standard that integrates Shariah compliance requirements with green finance eligibility criteria. Currently, issuers must navigate a complex landscape of overlapping and sometimes inconsistent standards: AAOIFI's Shariah standards for Sukuk structures, national Shariah board requirements that may diverge from AAOIFI in material respects, international green finance standards (ICMA Green Bond Principles, Climate Bonds Standard), and national green taxonomies that are being developed with varying degrees of alignment with international benchmarks. This multiplicity of standards imposes substantial transaction costs on issuers, complicates due diligence for investors, and creates opportunities for regulatory arbitrage that undermine the integrity of the dual compliance framework.

The proposed solution, the establishment of a unified international Shariah-green taxonomy through a joint committee of AAOIFI and IFSB, would represent a significant institutional innovation, requiring the two leading Islamic finance standard-setting bodies to coordinate their work programs in an unprecedented manner. However, there are encouraging precedents for such cooperation: AAOIFI and IFSB have previously collaborated on prudential standards and disclosure requirements, and both organisations have signalled their interest in sustainable finance as a priority area. A joint taxonomy effort, ideally aligned with the EU Sustainable Finance Taxonomy as the de facto global benchmark, would provide the market with the clarity and certainty it needs to scale green Sukuk issuances effectively.

The Legal Recognition Problem

A significant but underappreciated challenge for green Sukuk markets concerns the legal status of Shariah Supervisory Board rulings in civil court proceedings. In most jurisdictions outside of Malaysia, Saudi Arabia, and a small number of other Muslim-majority countries with dedicated Islamic finance legislation, the opinions of SSBs regarding Shariah compliance have no formal legal status: they are treated as private contractual arrangements between the issuer and the Shariah advisers, and civil courts generally lack the competence and inclination to evaluate their substantive correctness. This means that in the event of a dispute about the Shariah compliance of a green Sukuk, for example, if investors allege that the underlying project is not genuinely 'green' or not genuinely Shariah-compliant, there is no effective legal mechanism for resolving the dispute by reference to authoritative Shariah standards.

Addressing this challenge requires legislative reform that recognises SSB certifications as carrying legal weight in commercial disputes, analogous to the status of expert opinions in conventional financial litigation. Malaysia has made significant progress in this direction through the Central Bank of Malaysia Act 2009 and the Islamic Financial Services Act 2013, which give the SAC's rulings binding status on civil courts in Islamic finance disputes. Similar legislative frameworks in other major Islamic finance jurisdictions would substantially strengthen the legal enforceability of Shariah compliance representations in green Sukuk transactions and provide investors with effective remedies in the event of misrepresentation.

Greenwashing Risk in Dual-Compliant Instruments

The risk of greenwashing, the misrepresentation of financial instruments as environmentally beneficial when they do not in fact generate meaningful environmental improvements, is a pervasive concern in conventional green bond markets and poses equal or greater risks in green Sukuk markets. The dual compliance requirement of green Sukuk creates specific greenwashing vectors that differ from those present in conventional markets: issuers may obtain Shariah certification for a transaction structure that is technically Shariah-compliant but applies proceeds to projects with minimal environmental benefit, or may obtain green certification for a project that meets the formal criteria of the applicable green standard but generates environmental impacts of questionable significance.

Mitigating the risk of greenwashing in green Sukuk markets requires the establishment of a comprehensive governance and regulatory framework that promotes transparency, accountability, and investor confidence. A sustainable approach should incorporate several complementary mechanisms, including independent third-party verification, rigorous environmental impact assessments, continuous disclosure requirements, and effective monitoring procedures throughout the lifecycle of the Sukuk. Regular reporting obligations can enhance transparency by enabling investors and regulators to evaluate whether the proceeds are being utilized for genuinely sustainable projects and whether the expected environmental outcomes are being achieved. In addition, robust enforcement measures are essential to deter misleading sustainability claims and maintain market integrity. Regulatory authorities should possess the capacity to investigate violations and impose appropriate penalties in cases of inaccurate or deceptive disclosures. International experiences demonstrate the importance of such measures in strengthening market credibility. In particular, regulatory frameworks that require mandatory climate-related disclosures and establish legal consequences for material misrepresentation provide valuable examples for emerging green Sukuk markets. By adopting similar standards and adapting them to local legal and institutional contexts, jurisdictions can reduce greenwashing risks, improve investor trust, and support the long-term development of sustainable Islamic finance.

CONCLUSION

This paper has examined green Sukuk as instruments of sustainable Islamic finance through a legal, Shariah, and economic perspective, focusing on their doctrinal foundations, regulatory frameworks, market development, and prospects. The analysis demonstrates that green Sukuk constitute a significant innovation capable of mobilising capital towards climate action and sustainable development while remaining consistent with the principles of Islamic economic law. The study finds that Islamic jurisprudence provides a strong normative basis for sustainable finance. Concepts such as Khilafah, Maqasid Al-Shariah, and the principle of *La Darar wa La Dirar*, together with the asset-backed nature of Sukuk and the prohibition of speculative activities, reveal a profound compatibility between Islamic law and contemporary environmental objectives. Consequently, the challenge is not one of reconciliation but rather of effectively operationalising this compatibility through appropriate legal and institutional mechanisms. The rapid expansion of the green Sukuk market between 2020 and 2025 illustrates the increasing importance of these instruments within global Islamic capital markets. Nevertheless, several challenges continue to hinder their full potential, including the absence of a unified Shariah-green taxonomy, inconsistencies in regulatory approaches, concerns relating to greenwashing, and the limited development of secondary market infrastructure. Addressing these issues requires

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stronger international cooperation, enhanced Shariah governance, and more robust verification and disclosure mechanisms. The paper also highlights the need for further jurisprudential development concerning emerging issues such as carbon credits, biodiversity-linked financing, and liability arising from misleading sustainability claims. Ultimately, green Sukuk represent one of the most promising frontiers of Islamic finance and sustainable development. With continued scholarly engagement, regulatory commitment, and institutional coordination, they possess the capacity to promote both environmental stewardship and economic prosperity in accordance with the higher objectives of Islamic law.

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Author Contribution

Mariam Elbanna contributed to the study conception, literature review, data analysis, and manuscript drafting. Suparman Syukur provided academic supervision, contributed to the research design, and critically reviewed the manuscript. Bagus Eka Saputra assisted in data interpretation, manuscript revision, and methodological refinement. All authors contributed substantially to the research, approved the final version of the manuscript, and agreed to be accountable for the content of the work

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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