# *Ṣukūk* as a Catalyst for Green Infrastructure Financing in Nigeria.

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**Abstract**

The escalating challenges associated with urbanisation, climate change, and environmental degradation necessitate the urgent implementation of sustainable development solutions in developing economies, particularly Nigeria. Green infrastructure, encompassing both natural and engineered systems that mitigate environmental challenges and enhance urban resilience, remains severely underfunded, with existing financing mechanisms proving inadequate to meet Nigeria's sustainability needs. Despite its recognised potential, the financial constraints associated with green infrastructure development continue to impede its widespread adoption. This study examined the role of *Ṣukūk* (Islamic bonds) as a catalyst for green infrastructure financing in Nigeria, evaluating the extent to which *Ṣukūk* can bridge funding deficits and accelerate the transition towards sustainable urban development. The research adopted a qualitative methodology, employing a comprehensive review of relevant literature, policy analysis, and case studies of successful *Ṣukūk* issuances in other jurisdictions. The findings indicate that, although Nigeria has demonstrated an increasing interest in Islamic finance, *Ṣukūk* remain an underutilised mechanism for financing green infrastructure. The study identifies critical barriers to the adoption of *Ṣukūk* for green infrastructure financing, including limited awareness, regulatory constraints, and market inefficiencies. However, it also highlights emerging opportunities, such as increasing demand for sustainable investments and the alignment of Ṣukūk principles with both Islamic ethical finance and environmental sustainability. The study concludes that *Ṣukūk* presents a viable Sharī'ah-compliant financing mechanism capable of bridging Nigeria's green infrastructure funding gap, advancing environmental sustainability, and attracting ethical investments. Hence, the study recommends strengthening institutional frameworks, enhancing regulatory support for Green *Ṣukūk* issuance, and fostering public-private partnerships to attract sustainable investment.

Keywords: *Ṣukūk* Islamic Bond, Green Infrastructure, Sustainable Development, Nigeria

Word count: 253

## Introduction

Green infrastructure is a network of natural and semi-natural areas strategically designed to deliver environmental, social, and economic benefits. These include sustainable urban drainage systems, renewable energy projects, and reforestation initiatives that mitigate climate change, enhance biodiversity, and support human well-being (United

Nations, 2023). Nigeria's urgency for green infrastructure development is underscored by its estimated $100 billion annual infrastructure financing gap, yet less than $3 billion per year is currently mobilised for climate resilience projects (African Development Bank, 2023). Rapid urbanisation, escalating climate challenges, and severe environmental degradation compound these financing constraints. Urban expansion has increased deforestation, flooding, and pollution, while climate change exacerbates desertification and rising sea levels, particularly in coastal regions (Adegbite et al., 2023). Addressing these issues requires a deliberate shift toward sustainable development practices.

Nigeria's commitment to sustainable development is consistent with the United Nations Sustainable Development Goals (SDGs), particularly Goal 9 (Industry, Innovation, and Infrastructure) and Goal 13 (Climate Action). This is reflected in national policies including the Nigeria Climate Change Act (2021) and the National Renewable Energy and Energy Efficiency Policy (NREEEP, 2015), both of which seek to enhance environmental resilience through sustainable infrastructure investments. However, actualising these objectives requires substantial financial investment, a challenge that Nigeria continues to face due to limited fiscal capacity, rising public debt burdens, and restricted access to long-term financing mechanisms.

The successful implementation of green infrastructure projects is critically dependent on the availability of robust and sustainable financing mechanisms. These projects are characterised by substantial initial capital requirements and prolonged payback periods, which render conventional financing methods inadequate. In the Nigerian context, traditional funding sources such as government budgets and commercial loans are constrained by prohibitive interest rates, limited loan tenures, and insufficient capital inflows (Olawale & Yusuf, 2022). Furthermore, conventional financing frameworks prioritise short-term economic gains over long-term environmental and social benefits, resulting in a misalignment between funding structures and the overarching objectives of sustainability.

In recent years, green finance has gained prominence as a global response to the pressing challenges of sustainable development, with instruments such as green bonds and sustainability-linked loans being increasingly utilised to mobilise resources for environmentally sustainable initiatives. Nevertheless, the green finance market in Nigeria remains underdeveloped, significantly constraining the nation's capacity to undertake transformative infrastructure projects. This inadequacy underscores the critical need for innovative financing mechanisms that incorporate ethical, sustainable, and long-term investment principles. Islamic finance, particularly through the issuance of *Ṣukūk*, presents a viable and promising alternative to address these challenges. Between 2017 and 2023, Nigeria successfully raised ₦1.092 trillion through sovereign *Ṣukūk* issuances, demonstrating its potential as a reliable infrastructure financing tool (CBN, 2023). Expanding this model to Green *Ṣukūk* could unlock new capital for climate-resilient infrastructure projects.

*Ṣukūk* are structured to facilitate capital mobilisation for specific projects while conforming to Islamic principles. Unlike conventional bonds, which rely on *ribā* (fixed interest payments), *Ṣukūk* are structured around asset-backed transactions, thereby ensuring alignment with tangible economic productivity (Ahmed & Rahman, 2023). The foundational principles of *Ṣukūk* include profit-and-loss sharing, risk-sharing, and ethical investment, all of which collectively foster transparency and social responsibility. Green *Ṣukūk*, has gained global recognition, particularly in leading Islamic finance markets such as Malaysia, Indonesia, and the United Arab Emirates (Hassan et al., 2023). These countries have successfully deployed Green *Ṣukūk* to finance projects in renewable energy, sustainable transport, and climate adaptation, offering a model that Nigeria could adopt. For Nigeria, leveraging *Ṣukūk* offers a strategic opportunity to address persistent financing challenges in green infrastructure development. This is particularly relevant given Nigeria's previous *Ṣukūk* issuances totalling ₦1.092 trillion (2017–2023), which have been successfully deployed for road infrastructure projects (CBN, 2023).

This study provides a comprehensive exploration of the potential of Green *Ṣukūk* as a transformative financial instrument for bridging Nigeria's green infrastructure financing gap. Despite Nigeria's increasing adoption of Islamic finance, research on the integration of *Ṣukūk* into sustainable development initiatives remains scarce. This study, therefore, fills a critical gap by evaluating both the opportunities and regulatory constraints associated with Green *Ṣukūk* adoption in Nigeria.

**Green Infrastructure**

Green infrastructure (GI) has emerged as a critical paradigm in sustainable development, urban planning, and environmental management. It represents a strategic, nature-based approach that integrates ecological systems into urban and rural landscapes to enhance resilience, mitigate climate change impacts, and promote economic and social well-being (Benedict & McMahon, 2012). Unlike conventional grey infrastructure, which relies on engineered solutions, green infrastructure accentuates sustainable, multifunctional land-use planning that provides ecosystem services, supports biodiversity, and fosters climate adaptation (European Environment Agency [EEA], 2023).

Green infrastructure has been defined across multiple disciplines, including environmental management, urban planning, and climate adaptation. While interpretations vary, all definitions reinforce its role in integrating natural and built environments to enhance ecological resilience and socio-economic well-being.

The European Commission (2023) provides a comprehensive definition, stating that green infrastructure is a strategically planned network of natural and semi-natural areas designed to deliver a wide range of ecosystem services, such as water purification, air quality improvement, space for recreation, and climate mitigation and adaptation. This definition underscores the deliberate and systematic approach required to implement green infrastructure, distinguishing it from ad-hoc green spaces that may exist without strategic intent. The emphasis on ecosystem services indicates the crucial

role that green infrastructure plays in regulating environmental processes, enhancing biodiversity, and providing recreational and cultural benefits to human populations.

Similarly, Benedict and McMahon (2012) define green infrastructure as an interconnected system of green spaces that conserves ecosystem values and functions while providing benefits to human populations. This conceptualisation is consistent with landscape ecology principles, where green infrastructure is not merely about individual green spaces but rather about ensuring connectivity between natural and semi-natural areas. The notion of an interconnected system is critical because isolated green spaces may have limited ecological and social benefits, whereas a well-connected network enhances biodiversity corridors, promotes ecological balance, and improves urban resilience against environmental stressors such as flooding, extreme temperatures, and pollution.

Additionally, the U.S. Environmental Protection Agency (EPA) (2008) defines green infrastructure as an approach to wet weather management that uses soils and vegetation to utilise, enhance and/or mimic the natural hydrological cycle processes of infiltration, evapotranspiration, and reuse. This definition underscores the ecological functionality of green infrastructure, particularly in the management of stormwater and urban runoff. The EPA's perspective situates green infrastructure as a sustainable alternative to conventional grey infrastructure, which primarily relies on engineered solutions such as storm drains and sewer systems. Instead, green infrastructure integrates features such as rain gardens, permeable pavements, green roofs, and constructed wetlands to manage water sustainably while providing co-benefits such as urban cooling, habitat creation, and improved air quality.

The definitions above collectively accentuate several core attributes of green infrastructure:

1. Integrative Nature: Green infrastructure functions as a holistic system that merges natural and built environments, ensuring the harmonisation of ecological processes with human activities. This integrative approach is particularly vital in urban areas where the pressure of infrastructure development often leads to habitat fragmentation and environmental degradation;
2. Ecological Sustainability: Unlike traditional grey infrastructure – such as roads, drainage systems, and concrete buildings – which disrupt natural ecosystems, green infrastructure supports ecological balance, sustainability, and resilience;
3. Multi-Functional Benefits: Green infrastructure is not only an environmental intervention but also a social and economic asset. It enhances human health and well-being by improving air and water quality, offering recreational spaces, and fostering mental and physical health benefits. Additionally, it contributes to economic sustainability by reducing energy costs, preventing flood damage, and boosting property values in areas with well-planned green spaces;

4. Adaptation and Mitigation Potential: Climate change adaptation and mitigation are central to green infrastructure's conceptual framework. Green spaces, tree canopies, and vegetative covers reduce the urban heat island effect, absorb carbon emissions, and enhance resilience to extreme weather events. Strategic green infrastructure planning, therefore, aligns with broader global sustainability initiatives, including the United Nations Sustainable Development Goals (SDGs) and the Paris Agreement on Climate Change.

The recognition of green infrastructure as a multi-dimensional and cross-sectoral approach allows scholars and policymakers to increasingly advocate its integration into urban planning, environmental governance, and national development strategies. In contrast to conventional infrastructure models that prioritise engineered solutions, green infrastructure leverages the power of nature to address environmental and socio-economic challenges sustainably. This evolving conceptualisation reveals the necessity for policy coherence, interdisciplinary collaboration, and innovative financing mechanisms to mainstream green infrastructure in contemporary development frameworks.

Green infrastructure is encapsulated in interdisciplinary theories, including landscape ecology, the ecosystem services framework, and sustainable urbanism. Landscape Ecology Theory (Forman, 1995) highlights green infrastructure as a spatially interconnected system that enhances biodiversity conservation and ecosystem connectivity. This framework underscores the importance of habitat corridors, green belts, and ecological networks in mitigating habitat fragmentation and facilitating species migration.

Another critical theoretical underpinning is the Ecosystem Services Framework, which indicates the multifaceted benefits of green infrastructure. According to the Millennium Ecosystem Assessment (MEA) (2005), green infrastructure contributes to provisioning services (such as food and water supply), regulating services (including climate control and air purification), supporting services (such as nutrient cycling), and cultural services (such as recreational and aesthetic values). This framework situates green infrastructure as an essential component of natural capital that supports human well-being. Additionally, Sustainable Urbanism, as expounded by Beatley (2011), integrates green infrastructure into urban planning to enhance environmental resilience, economic viability, and social equity. Cities adopting this approach prioritise the incorporation of green spaces, permeable surfaces, and nature-based solutions to address urban challenges such as climate change adaptation, stormwater management, and heat island effects. These theoretical perspectives collectively reinforce the role of green infrastructure as a vital strategy for sustainable development and ecological conservation.

Green infrastructure holds profound global and regional significance as a strategic approach to sustainable development, climate resilience, and ecological conservation. On a global scale, it conforms with international environmental

frameworks such as the United Nations Sustainable Development Goals (SDGs), particularly Goal 11 (Sustainable Cities and Communities) and Goal 13 (Climate Action), which advocate for resilient urban planning and climate adaptation strategies (United Nations, 2015). The integration of natural and semi-natural systems into urban and rural landscapes ensures that green infrastructure helps mitigate climate change effects, improve air and water quality, and enhance biodiversity conservation. Furthermore, in response to increasing urbanisation and climate-induced challenges, cities worldwide, such as Singapore, Copenhagen, and New York, have implemented extensive green infrastructure initiatives, including green roofs, permeable pavements, and urban forests, to manage stormwater, reduce heat island effects, and promote urban sustainability (World Bank, 2021). These global efforts reflect the growing recognition of green infrastructure as a cost-effective and multifunctional solution to contemporary environmental and socio-economic challenges.

At the regional level, particularly in Africa and Nigeria, green infrastructure is increasingly acknowledged as a crucial mechanism for addressing environmental degradation, rapid urbanisation, and climate vulnerability. Many African nations face challenges such as deforestation, desertification, and inadequate urban planning, making nature-based solutions essential for sustainable development. The African Union's Agenda 2063 underscores the importance of environmental sustainability, advocating the restoration of degraded ecosystems and the integration of green infrastructure into urban planning (African Union, 2015).

In Nigeria, where urban expansion and climate change exacerbate flooding, air pollution, and declining biodiversity, green infrastructure is increasingly recognised as a vital climate adaptation strategy. The Great Green Wall project, launched in 2007, is targeted at the restoration of over 100 million hectares of degraded land across northern Nigeria by 2030, providing livelihoods for local communities (UNCCD, 2020). Also, urban greening initiatives in Lagos and Abuja have incorporated tree-planting programmes and wetland restoration to combat rising temperatures and mitigate flood risks.

The origin of green infrastructure can be traced to the late 19$^{th}$ and early 20$^{th}$ centuries, when urban planners and conservationists, including Frederick Law Olmsted, advocated the integration of parks and green spaces into city designs to enhance public health and ecological balance (Benedict & McMahon, 2006). The term "green infrastructure" gained prominence in the late 20$^{th}$ and early 21$^{st}$ centuries, particularly as governments and environmental organisations recognised the need for sustainable alternatives to grey infrastructure. The 1990s and early 2000s saw increased adoption of green infrastructure approaches in the United States and Europe, influenced by landscape ecology and the ecosystem services framework, as emphasised by the Millennium Ecosystem Assessment (MEA, 2005). In subsequent years, global initiatives such as the European Green Infrastructure Strategy (2013) and the United Nations Sustainable Development Goals (2015) further institutionalised the concept,

promoting nature-based solutions for climate resilience, biodiversity conservation, and sustainable urban development. Today, green infrastructure is widely embraced worldwide, with cities and nations integrating it into policies and planning frameworks to address environmental and socio-economic challenges.

### 2.3*Ṣukūk* (Sharī'ah-Compliant Bonds)

*Ṣukūk* are described as Sharī'ah-compliant bonds, but they fundamentally differ from conventional bonds in structure, purpose, and underlying assets. They are well entrenched in *Fiqh al-Mu'āmalāt* (Islamic commercial jurisprudence). *Ṣukūk* conform to the Islamic contractual principles, ensuring that financial transactions are asset-backed and free from *ribā* (interest), *gharar* (excessive uncertainty), and *maysir* (gambling). Unlike traditional bonds, which represent debt obligations generating fixed interest, Ṣukūk grant investors ownership stakes in tangible assets, usufructs, or services, thereby ensuring compliance with Sharī'ah principles.

The Accounting and Auditing Organisation for Islamic Financial Institutions (AAOIFI) defines *Ṣukūk* as certificates of equal value representing undivided shares in ownership of tangible assets, usufruct, and services, or the ownership of the assets of a specific project or investment activity (AAOIFI, 2023). This definition underscores two fundamental aspects: first, *Ṣukūk* must be backed by real economic activities, ensuring they are not mere speculative instruments; second, they must be structured in accordance with Sharī'ah contracts, including *Murābaḥah* (cost-plus sale), *Ijārah* (leasing), *Mushārakah* (partnership), *Muḍārabah* (profit-sharing), and *Istisnā'* (construction financing) (Ibrahim & Alam, 2023). The underlying contractual arrangement dictates the risk-sharing mechanism, profit distribution, and overall structure of *Ṣukūk* issuance.

*Ṣukūk* play a pivotal role in mobilising capital for large-scale economic projects, particularly in sectors such as infrastructure development, renewable energy, and real estate. Their significance extends beyond the Islamic world, as both Muslim-majority and non-Muslim countries have adopted *Ṣukūk* as part of their financial strategies to diversify funding sources and attract ethical investors (Ahmed et al., 2022). For instance, *Ṣukūk* are widely used for financing critical public infrastructure, including roads, airports, and energy projects in countries such as Malaysia, Saudi Arabia, and Nigeria, thereby ensuring economic sustainability while adhering to Islamic financial principles (Mohieldin & Iqbal, 2022).

Furthermore, *Ṣukūk* are indispensable in enhancing financial inclusion by providing ethical, interest-free investment opportunities that cater to diverse stakeholders, including institutional investors, Islamic banks, sovereign wealth funds, microfinance institutions, and retail investors. This inclusivity allows small-scale investors, non-Muslim ethical investors, and even underserved communities to participate in capital markets without compromising their religious or moral principles (Alam et al., 2023). Also, *Ṣukūk* facilitate access to financing for small and medium-sized enterprises (SMEs) and social impact projects, thereby bridging financial

gaps in economies where traditional banking services may be inaccessible or misaligned with Islamic financial principles. Fostering risk-sharing mechanisms and supporting impact-driven financing models enables *Ṣukūk* to contribute to the democratisation of investment opportunities, empowering individuals and businesses alike while promoting economic resilience and sustainable development (Ibrahim, 2023).

Similarly, *Ṣukūk* contribute significantly to financial market stability due to their asset-backed and risk-sharing nature, which mitigates speculative activities that usually lead to financial crises. *Ṣukūk* transactions are backed by tangible assets or usufruct, ensuring that financial flows are directly linked to real economic activities. This structure enhances market discipline by promoting responsible investment practices and reducing the likelihood of speculative bubbles (Usmani, 2021). Risk-sharing mechanisms embedded in *Ṣukūk* contracts ensure that investors and issuers equitably bear profit and loss, fostering a more resilient financial ecosystem.

Empirical studies and data have shown that during the 2008 global financial crisis, Islamic financial institutions, including those issuing *Ṣukūk*, exhibited greater resilience compared to conventional financial institutions. A report by the Islamic Financial Services Board (IFSB) indicated that *Ṣukūk* issuances declined by only 9% in 2008, compared to a 40% contraction in global conventional bond markets. This relative stability is attributed to Ṣukūk's asset-backed nature, risk-sharing mechanisms, and ethical financial principles, which discourage excessive leverage and speculative activities.

The *Ṣukūk* market has experienced remarkable expansion over the past two decades, with global issuances exceeding $180 billion annually, reflecting the rising demand for Sharī'ah-compliant financial instruments (IIFM, 2023). This growth is primarily driven by increased participation from both Muslim-majority and non-Muslim countries, seeking to diversify their financing sources and attract investment from the Islamic finance industry. Leading issuers include Malaysia, Saudi Arabia, the United Arab Emirates, and Indonesia, which have established robust *Ṣukūk* frameworks, supported by well-developed Islamic financial infrastructures. Furthermore, non-Muslim nations, particularly, the United Kingdom, Luxembourg, and South Africa, have successfully issued sovereign *Ṣukūk*, demonstrating the instrument's global appeal beyond Islamic jurisdictions (Ahmed et al., 2022). These issuances underscore the increasing acceptance of *Ṣukūk* as a mainstream financial instrument and underscore their role in international capital markets.

Several main trends have shaped the *Ṣukūk* industry, reflecting its evolution and adaptability to modern financial demands. Sovereign *Ṣukūk* issuances have gained prominence as governments utilise them to fund public infrastructure and socio-economic development projects. Nigeria, for instance, launched its first sovereign *Ṣukūk* in 2017, with subsequent issuances dedicated to financing road and transport infrastructure (CBN, 2023). Additionally, the emergence of Green *Ṣukūk* signifies the conformity of Islamic finance with environmental,

social, and governance (ESG) principles, facilitating investments in renewable energy and climate-resilient projects (Ibrahim, 2023).

Efforts to enhance *Ṣukūk* standardisation have also gained momentum, with regulatory bodies such as the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), the Islamic Financial Services Board (IFSB), and the International Islamic Liquidity Management Corporation (IILM) working towards harmonising *Ṣukūk* structures to streamline cross-border issuances and enhance global market integration (Alam et al., 2023). These developments collectively reinforce the role of *Ṣukūk* as a dynamic and sustainable financing instrument within both Islamic and conventional financial ecosystems.

*Ṣukūk* are classified based on their underlying Sharī'ah-compliant contractual structures, each serving distinct financial and economic purposes. *Iṣṭiṣnā' Ṣukūk* are utilised primarily for project financing, particularly in the construction and infrastructure sectors, enabling gradual payments as projects progress. *Ijārah Ṣukūk*, structured on leasing agreements, generate stable returns through periodic rental payments, making them attractive for investors seeking predictable income streams. *Mushārakah Ṣukūk* represent equity participation in joint ventures, where investors share both profits and losses, aligning with Islamic principles of risk-sharing. Similarly, *Muḍārabah Ṣukūk* operate on a profit-sharing basis, where one party provides capital, while the other undertakes entrepreneurial or investment activities, with profits distributed according to a pre-agreed ratio. *Murābaḥah Ṣukūk*, structured on cost-plus financing, are commonly used in trade transactions, where an asset is purchased by the issuer and sold to investors at a marked-up price, with deferred payments. Additionally, the emergence of Green *Ṣukūk* reflects the increasing integration of Islamic finance with environmental sustainability, as these instruments are exclusively dedicated to funding eco-friendly projects, such as renewable energy and climate-resilient infrastructure. This diversity in *Ṣukūk* structures enables them to cater to a wide range of investment needs, reinforcing their role as a key instrument in Islamic financial markets.

## Critical Analysis

### *Ṣukūk* and Green Infrastructure Financing: Potential Benefits for Nigeria

The transition to sustainable infrastructure is crucial for Nigeria's economic resilience and environmental sustainability. However, financing such large-scale projects remains a significant challenge due to budgetary constraints and limited access to conventional funding. *Ṣukūk* offer an ethical and asset-backed alternative to mobilise capital for green infrastructure development. This section explores the potential of *Ṣukūk* in financing Nigeria's green infrastructure, analysing its benefits in capital mobilisation, risk mitigation, social impact, and public-private partnerships.

### A. Capital Mobilisation for Green Infrastructure Development

Nigeria faces a significant infrastructure financing gap, particularly in the area of green infrastructure,

which includes renewable energy, sustainable transportation, and climate-resilient projects. Given the constraints of conventional financing mechanisms – such as high interest rates, short loan tenures, and limited accessibility to long-term funding – *Ṣukūk* present an alternative Sharī'ah-compliant instrument to mobilise substantial capital for large-scale green infrastructure initiatives. (Alam et al., 2023). This structure is consistent with the ethical and sustainability principles required for green infrastructure financing, allowing Nigeria to attract Islamic investors, institutional funds, and global ESG-conscious stakeholders.

The successful issuance of sovereign and corporate *Ṣukūk* in countries like Malaysia and Indonesia for financing green projects underscores the viability of this approach as a sustainable alternative to conventional financing. Malaysia, a global leader in Islamic finance, has issued over $12 billion in Green *Ṣukūk* since the introduction of its Sustainable and Responsible Investment (SRI) *Ṣukūk* framework in 2014 (Securities Commission Malaysia, 2023). These issuances have funded renewable energy projects, green buildings, and sustainable transport infrastructure. Similarly, Indonesia has made significant strides in leveraging Green *Ṣukūk* for environmental sustainability. Since 2018, Indonesia has successfully raised over $6 billion through multiple Green *Ṣukūk* issuances, financing projects in reforestation, climate resilience, and clean energy transition (Ministry of Finance Indonesia, 2023). These case studies reveal how *Ṣukūk*-based green financing can attract ethical investors, enhance environmental, social, and governance (ESG) compliance, and support long-term sustainable development objectives.

Through *Ṣukūk*, Nigeria can effectively bridge its infrastructure financing deficit and accelerate the development of climate-friendly projects. Between 2017 and 2023, Nigeria successfully raised ₦1.092 trillion through sovereign Ṣukūk issuances, demonstrating its effectiveness in financing road and transport infrastructure (CBN, 2023; Ibrahim & Khan, 2023). Expanding this model to Green *Ṣukūk* could unlock new funding for renewable energy and climate adaptation projects, reducing the country's reliance on high-interest conventional debt financing.

With an estimated annual infrastructure financing gap of $100 billion, Nigeria faces significant challenges in funding sustainable energy, efficient transportation, and climate resilience projects (African Development Bank, 2023). The deployment of Green *Ṣukūk* will enalble the country to attract both domestic and international ethical investors, particularly those focused on environmental, social, and governance (ESG) investments. This approach is consistent with Nigeria's commitment to the Paris Agreement and its Energy Transition Plan, fostering long-term economic stability and environmental sustainability.

**B. Risk Mitigation through Profit-Loss Sharing**

Green infrastructure investment is perceived as high-risk due to long project gestation periods, regulatory uncertainties, and fluctuating market conditions. Equity-based *Ṣukūk* mitigate these risks by embedding profit-and-loss sharing mechanisms,

ensuring that financial burdens are distributed between investors and issuers, rather than being placed solely on the borrower (Usmani, 2021). Unlike conventional debt-based instruments, which place the full financial burden on the borrower, these Sharī'ah-compliant securities distribute risks equitably, reducing the probability of default while enhancing investor confidence. During the 2008 global financial crisis, Islamic financial markets, including Ṣukūk, demonstrated greater stability, with *Ṣukūk* issuances experiencing only a 9% decline, compared to a 40% contraction in global conventional bond markets (IIFM, 2023). This resilience underscores the effectiveness of risk-sharing mechanisms in stabilising investment flows during market fluctuations

Furthermore, *Ijārah Ṣukūk*, which are structured as lease-based instruments, ensure that investments are tied to real economic activities, mitigating speculative risks and enhancing market stability. This asset-backed model aligns with Nigeria's infrastructure financing needs, ensuring that funds raised through Ṣukūk directly contribute to tangible projects such as solar energy plants, afforestation programmes, and sustainable water management initiatives (Al-Saadi, 2022). This conforms with Nigeria's urgent need for sustainable financing mechanisms to support projects in renewable energy, afforestation, and water resource management. Given the country's growing vulnerability to climate change, risk-sharing mechanisms in *Ṣukūk* make them an attractive alternative to conventional financing, fostering long-term economic resilience while promoting environmental sustainability.

As Nigeria transitions towards a low-carbon economy, Ṣukūk structures provide a sustainable financing mechanism to mobilise institutional and ethical investors, ensuring long-term funding for climate-friendly projects while strengthening socio-economic resilience. By embedding risk-sharing principles, Ṣukūk not only reduce financial volatility but also create an enabling environment for sustainable development investments.

### C. Social and Environmental Impact of Green Ṣukūk

Green *Ṣukūk*, a specialised form of Sharī'ah-compliant bonds, is uniquely structured to finance environmentally sustainable and socially responsible projects. As Nigeria grapples with climate adaptation challenges, deforestation, and the urgent need for a clean energy transition, the adoption of Green Ṣukūk presents a viable and ethical financing solution that aligns with the country's Energy Transition Plan and its commitments under the Paris Agreement (Ahmed et al., 2023). The mobilisation of funds towards renewable energy initiatives, sustainable agriculture, and eco-friendly transportation systems ensures that Green *Ṣukūk* can significantly support the country's sustainability goals, while also addressing pressing socio-economic concerns. Investments in solar and wind energy projects, for instance, can help reduce Nigeria's heavy reliance on fossil fuels, which currently account for over 80% of its energy generation (World Bank, 2021). The country aims to generate 30% of its electricity from renewable sources by 2030, a target that could be accelerated through Green Ṣukūk financing (IIFM, 2023).

Likewise, financing afforestation programmes through Green Ṣukūk can combat deforestation, which causes Nigeria to lose approximately 350,000 hectares of forest annually – the highest rate in Africa (United Nations, 2023). Desertification has significantly reduced agricultural productivity, worsening food insecurity and rural poverty. Green Ṣukūk can provide long-term financing for afforestation initiatives, such as the Great Green Wall project, which aims to restore 100 million hectares of degraded land by 2030 (IIFM, 2023)

Beyond environmental benefits, Green *Ṣukūk* play a crucial role in economic development and job creation. The financing of labour-intensive green projects, such as waste management, sustainable housing, and clean water infrastructure, can create thousands of jobs, particularly for youth and low-income communities, in a country where unemployment remains high at 33.3% (Nigerian Bureau of Statistics, 2023). Expanding Green Ṣukūk financing in these sectors can generate long-term employment, support skills development, and reduce poverty, particularly in rural areas. (Hassan & Lewis, 2023). Given Nigeria's high unemployment rate, deploying Green *Ṣukūk* to fund eco-friendly industries can significantly reduce the poverty rate while enhancing inclusive economic growth. Furthermore, the ethical principles underpinning Islamic finance, including justice, transparency, and risk-sharing, ensure that Green *Ṣukūk* conform with Environmental, Social, and Governance (ESG) investment principles, making them attractive to both domestic and international impact investors.

As global demand for sustainable and ethical investment rises, Nigeria's adoption of Green Ṣukūk could position it as a regional leader in Islamic sustainable finance, alongside Malaysia and Indonesia, which have successfully issued over $18 billion in Green Ṣukūk since 2017 (IIFM, 2023).

### D. Government and Private Sector Synergy in Green Ṣukūk Issuance

A main driver for the successful implementation of Green *Ṣukūk* in Nigeria is strong collaboration between the government and the private sector. The public sector, through clear regulatory frameworks, sovereign guarantees, and credit enhancement mechanisms, can create a conducive environment for *Ṣukūk* issuances. For instance, Malaysia's SRI (Sustainable and Responsible Investment) Ṣukūk framework includes tax exemptions and government-backed risk-sharing mechanisms, significantly boosting investor confidence (Securities Commission Malaysia, 2023). Implementing similar strategies in Nigeria can encourage private sector participation in Green *Ṣukūk* issuances (OECD, 2023).

Public-private partnerships (PPPs) provide a strategic and sustainable financing model for critical green infrastructure projects. Nigeria has implemented PPP frameworks in key sectors such as transport, energy, and water supply, with notable examples including the Lekki Deep Seaport and Azura-Edo Independent Power Project (Nigerian Infrastructure Concession Regulatory Commission, 2023). Leveraging similar structures for Green *Ṣukūk* issuance can facilitate long-term financing for

energy-efficient buildings, flood control systems, sustainable urban transport, and clean water projects. (Alam & Rahman, 2023).

The success of Green Ṣukūk PPP models in countries such as Indonesia, Malaysia, and the UAE demonstrates the viability and scalability of this approach for Nigeria. Indonesia, for instance, has issued over $6 billion in Green Ṣukūk since 2018, financing projects in reforestation, clean energy, and sustainable infrastructure (Ministry of Finance Indonesia, 2023). Malaysia, as a global leader, has mobilised over $12 billion in Green Ṣukūk through its Sustainable and Responsible Investment (SRI) framework (Securities Commission Malaysia, 2023). These figures highlight the potential of Green Ṣukūk as a scalable financing solution for Nigeria's green infrastructure development.

Additionally, fostering collaboration with multilateral development institutions and Islamic finance bodies, such as the Islamic Development Bank (IsDB) and the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), can further strengthen Nigeria's position in the global Green Ṣukūk market.

**E. Reduction of Public Debt Burden**

Unlike conventional loans that rely on interest-based financing and contribute to the accumulation of unsustainable sovereign debt, Green Ṣukūk offer a Sharī'ah-compliant alternative that alleviates fiscal strain. Nigeria's public debt reached ₦87.38 trillion ($113 billion) in 2023, with debt servicing consuming over 90% of government revenue (Debt Management Office, 2023). Through Green Ṣukūk, Nigeria can finance infrastructure without exacerbating its debt vulnerabilities, ensuring a more sustainable and balanced fiscal strategy (Usmani, 2022).

Furthermore, Green *Ṣukūk* can attract a diverse pool of ethical and impact investors who are aligned with sustainability and responsible finance principles, thereby expanding funding sources beyond traditional lending institutions (OECD, 2023). The issuance of Green Ṣukūk enables the government to tap into the $4.5 trillion global Islamic finance market and the $35 trillion ESG investment sector (OECD, 2023). By positioning itself as a leader in Islamic sustainable finance, Nigeria can attract long-term funding from sovereign wealth funds, development finance institutions, and ethical investors seeking climate-resilient projects.

Additionally, the asset-backed nature of Green Ṣukūk mitigates speculative risks and enhances financial market stability, further reducing borrowing costs. Nigeria's conventional Eurobonds carry interest rates exceeding 8–10%, whereas sovereign Ṣukūk issuances have attracted lower rates due to their structured risk-sharing approach (CBN, 2023). This makes Green Ṣukūk a more sustainable financing model compared to high-interest debt instruments (Ibrahim, 2023).

As Nigeria transitions towards a low-carbon economy and climate-resilient infrastructure, Green Ṣukūk provide a viable and responsible financing alternative that aligns with Nigeria's National Development Plan (2021–2025) and the Economic Sustainability Plan (ESP), thereby reducing reliance on high-interest borrowing and promoting fiscal

discipline, Green Ṣukūk can enhance economic resilience, strengthen financial sovereignty, and drive long-term national development objectives.

**F. Energy Security and Renewable Energy Expansion**

The issuance of Green *Ṣukūk* presents a strategic financing mechanism for advancing Nigeria's transition towards a renewable energy-driven economy. Through the mobilisation of capital for solar, wind, and hydropower projects, Green Ṣukūk can significantly reduce the nation's reliance on fossil fuels, thereby enhancing energy security and environmental sustainability (Ahmed & Lewis, 2023). The integration of renewable energy into Nigeria's energy mix is particularly crucial given the persistent power shortages, with over 85 million Nigerians (43% of the population) lacking access to electricity (World Bank, 2023). The country's dependence on fossil fuels, which account for over 80% of its energy generation, exposes it to global oil price volatility, posing challenges to economic growth and industrial productivity. Green Ṣukūk can provide long-term financing for solar, wind, and hydropower projects, ensuring a more stable and sustainable energy sector (Ahmed & Lewis, 2023)

Furthermore, investments in renewable energy infrastructure through Green Ṣukūk can facilitate the expansion of affordable, reliable, and sustainable electricity access, particularly for rural and underserved communities. Over 60% of rural Nigerians lack access to grid electricity, making off-grid renewable energy solutions a critical development priority (International Renewable Energy Agency, 2023). Green Ṣukūk can finance mini-grid solar projects, decentralised wind farms, and hydropower plants, supporting Nigeria's Rural Electrification Strategy and Implementation Plan while advancing SDG 7 (IIFM, 2023).

Reducing dependence on carbon-intensive energy sources enables Nigeria to curb greenhouse gas emissions, which reached 126.9 million metric tons of $CO_2$ in 2022 (IEA, 2023). The country aims to generate 30% of its electricity from renewable sources by 2030 under the National Renewable Energy and Energy Efficiency Policy (NREEEP, 2015). Financing solar, wind, and hydro projects through Green Ṣukūk can accelerate this transition, ensuring Nigeria meets its carbon reduction commitments under the Paris Agreement (IIFM, 2023).

Consequently, the adoption of Green Ṣukūk as a financing instrument for renewable energy development will not only accelerate Nigeria's energy diversification efforts but also enhance its global competitiveness in sustainable finance. By reducing dependence on fossil fuels and strengthening its climate resilience strategy, Nigeria can position itself as a leading hub for Islamic sustainable finance in Africa, attracting ESG-conscious investors and ensuring long-term economic stability (IIFM, 2023).

**G. Enhancement of Financial Market Development**

The issuance of Green Ṣukūk has the potential to significantly deepen Nigeria's Islamic capital market, which remains in its early stages but has shown steady growth. Nigeria has successfully raised ₦1.092 trillion ($1.4 billion) through sovereign

Ṣukūk issuances since 2017, primarily for infrastructure projects (CBN, 2023). Expanding this model to Green Ṣukūk will introduce a broader range of Sharī'ah-compliant investment instruments, attracting new market participants.

As an innovative financial product, Green *Ṣukūk* offer ethical and interest-free investment opportunities that are consistent with principles of Islamic finance, thereby broadening market participation and fostering financial inclusion (IIFM, 2023). By catering to the investment preferences of institutional investors, Islamic banks, pension funds, and ethical investment funds, the introduction of Green Ṣukūk can enhance liquidity and depth within Nigeria's Islamic capital market. This will allow for greater market participation, improved price discovery, and enhanced tradability of Islamic financial instruments.

Furthermore, the integration of Green *Ṣukūk* into the financial system enhances the diversification of funding sources, reducing reliance on conventional debt instruments and external borrowing. The appeal of Sharī'ah-compliant green investments can attract both domestic and international investors, particularly from regions with established Islamic finance hubs, such as the Middle East, Southeast Asia, and North Africa. By 2023, the global Green Ṣukūk market exceeded $40 billion, with Malaysia and Indonesia leading issuances (IIFM, 2023). Nigeria's adoption of Green Ṣukūk will allow it to tap into this growing investor pool and strengthen its position in global Islamic finance markets.

Ultimately, the development of a robust Green Ṣukūk market can position Nigeria as a regional leader in Islamic sustainable finance, alongside Malaysia and Indonesia, which have successfully issued over $18 billion in Green Ṣukūk (IIFM, 2023). By establishing a well-regulated Green Ṣukūk framework, Nigeria can enhance financial market stability, attract foreign investment, and solidify its role in the global movement towards environmentally responsible investment practices.

## Challenges and Prospects of Financing Green Infrastructure through *Ṣukūk* in Nigeria

Financing green infrastructure in Nigeria remains a critical concern due to the country's growing environmental challenges and the need for sustainable development. Several obstacles hinder the widespread adoption of *Ṣukūk* for green projects. These challenges include regulatory constraints, investor awareness, and market depth. However, with the right policy interventions, financial innovations, and increased stakeholder collaboration, Nigeria has promising prospects for the deployment of Green *Ṣukūk* to fund climate-friendly infrastructure and drive sustainable economic growth.

## Challenges of Financing Green Infrastructure through *Ṣukūk* in Nigeria

### A. Regulatory and Legal Constraints

Nigeria's financial regulatory framework for Islamic finance is still evolving, and the absence of a dedicated legal structure for Green *Ṣukūk* issuance presents a significant barrier to its widespread adoption (Olanrewaju et al., 2022). While the Securities and Exchange Commission (SEC)

introduced *Ṣukūk* regulatory guidelines in 2013 and later revised them in 2020, these regulations lack specific provisions tailored to green-certified instruments (SEC, 2023). This regulatory gap creates uncertainty for investors and issuers, as there are no clear eligibility criteria, reporting frameworks, or incentives for Green *Ṣukūk* issuance.

Additionally, the absence of a harmonised taxonomy for classifying green assets within Nigeria's Islamic finance sector complicates regulatory compliance. Unlike Malaysia's Sustainable and Responsible Investment (SRI) Ṣukūk framework, which provides clear classifications for green projects, Nigeria lacks a comparable system (Securities Commission Malaysia, 2023). Without standardised Sharī'ah-compliant ESG criteria, investors and issuers face difficulties in assessing project eligibility and ensuring regulatory alignment (Ahmed et al., 2023).

Moreover, inter-agency coordination challenges between the Central Bank of Nigeria (CBN), SEC, and the National Pension Commission (PenCom) have contributed to delays in policy development and limited incentives for green finance instruments. For instance, the delayed approval of pension fund investments in Sharī'ah-compliant assets, including Ṣukūk, has slowed capital mobilisation for Islamic financial instruments (Ibrahim & Yusuf, 2023). Addressing these institutional misalignments is crucial for facilitating the seamless integration of Green Ṣukūk into Nigeria's financial landscape.

**B. Limited Awareness and Investor Education**

A major barrier to the widespread adoption of Green Ṣukūk in Nigeria is the limited awareness and understanding of its principles, benefits, and operational mechanisms among critical stakeholders. A 2023 survey by the Nigerian Financial Intelligence Unit (NFIU) revealed that over 70% of institutional investors lacked familiarity with Sharī'ah-compliant green financing instruments (Akinyemi et al., 2023). This knowledge gap restricts investor participation and hinders the development of Nigeria's Islamic sustainable finance market.

Many market participants lack the technical expertise in structuring, issuing, and managing Sharī'ah-compliant green bonds, which has slowed market development and capital mobilisation. Unlike Malaysia and Indonesia, where Green Ṣukūk frameworks are supported by structured training and certification programmes, Nigeria lacks dedicated technical assistance for financial professionals (Securities Commission Malaysia, 2023). Developing capacity-building initiatives in collaboration with the Central Bank of Nigeria (CBN) and the Securities and Exchange Commission (SEC) would bridge this gap and facilitate a more robust Green Ṣukūk ecosystem.

Furthermore, financial institutions lack structured capacity-building programmes to train professionals in Sharī'ah-compliant green finance, leading to institutional hesitation in adopting innovative financial instruments. In contrast, countries such as Malaysia and the UAE have integrated Islamic green finance education into mainstream banking certification programmes (Ibrahim & Musa, 2023). Nigeria's banking sector and capital market operators must collaborate with regulatory bodies and academic institutions to develop specialised

training modules that equip financial professionals with the expertise to structure and manage Green Ṣukūk instruments.

The gap is further exacerbated by low investor confidence, driven by misconceptions about Islamic finance, concerns over liquidity, and uncertainty about the risk-return profile of Green Ṣukūk compared to conventional green bonds. Many investors perceive Ṣukūk as illiquid due to the absence of a secondary market in Nigeria, limiting their tradeability compared to conventional bonds (Hassan & Lewis, 2023). Additionally, misconceptions regarding Sharī'ah-compliant financing, including assumptions that Islamic finance offers lower returns or higher risks, discourage institutional participation. Establishing a well-regulated secondary market for Green Ṣukūk and promoting investor education campaigns will be critical in addressing these concerns and enhancing market confidence

**C. Absence of Standardised Green Certification Framework**

A significant challenge to the development of Green *Ṣukūk* in Nigeria is the lack of a well-defined and standardised green certification framework. In conventional financial markets, Environmental, Social, and Governance (ESG) certifications serve as a benchmark for evaluating the sustainability credentials of investment instruments. Malaysia and Indonesia have integrated ESG certification frameworks into their Green Ṣukūk markets, using third-party verification standards such as the Climate Bonds Initiative (CBI) and the ASEAN Green Bond Standards (Securities Commission Malaysia, 2023). These frameworks enhance transparency and investor confidence, ensuring that funds are allocated to projects that meet rigorous environmental criteria (Ahmed & Lewis, 2023).

However, in Nigeria, the absence of a uniform, transparent, and credible certification process for Green Ṣukūk leads to concerns about greenwashing, where projects falsely claim to be environmentally sustainable without meeting stringent sustainability criteria. Globally, cases such as the mislabeling of bonds as 'green' by major institutions – including the 2018 controversy where several 'green' bonds failed to meet climate impact targets – illustrate the risks of weak certification frameworks (OECD, 2023). Without a regulatory mechanism for independent verification, Nigeria's Green Ṣukūk market remains vulnerable to similar risks, reducing investor confidence and market integrity.

Without a designated regulatory body or independent verification agencies to oversee green certifications, there is a lack of consistency in assessing whether projects funded by Green Ṣukūk truly align with global climate and sustainability goals. Countries like Malaysia and Indonesia have introduced regulatory bodies responsible for verifying green certifications through agencies such as the Securities Commission Malaysia (SCM) and the Indonesia Financial Services Authority (OJK) (Securities Commission Malaysia, 2023). In Nigeria, the Securities and Exchange Commission (SEC) and the Central Bank of Nigeria (CBN) could play a leading role in establishing a standardised certification system for Green Ṣukūk, ensuring credibility and regulatory compliance.

Additionally, the absence of standardised Sharī'ah-compliant green finance guidelines creates further uncertainty for Islamic investors who seek clarity on the ethical and environmental integrity of such instruments. Establishing a dedicated Sharī'ah-compliant green certification framework—similar to Malaysia's SRI Ṣukūk guidelines—would provide greater transparency, enhance market confidence, and facilitate the growth of Nigeria's Islamic green finance sector (IIFM, 2023).

### D. Limited Liquidity and Secondary Market Trading

One of the major challenges facing Green *Ṣukūk* financing in Nigeria is the limited liquidity of *Ṣukūk* instruments in the secondary market. Unlike conventional bonds, which benefit from deep capital markets and active trading, the Nigerian Ṣukūk market remains underdeveloped, with limited secondary market activity. As of 2023, Nigeria's sovereign Ṣukūk issuances totalled ₦1.092 trillion ($1.4 billion), yet secondary market trading remains negligible due to a lack of liquidity-enhancing mechanisms (CBN, 2023). This restricts short-term and institutional investors who require flexible exit strategies and discourages active portfolio management. This illiquidity makes it difficult for investors to buy and sell Green Ṣukūk easily, reducing their appeal to short-term and institutional investors who require flexible exit strategies. Developing a robust secondary market for Green Ṣukūk in Nigeria will require policy interventions such as: (i) introducing designated market makers to enhance trading activity, (ii) integrating Ṣukūk into the Nigerian Exchange (NGX) and FMDQ platforms, and (iii) incentivising financial institutions to engage in secondary market trading (CBN, 2023). Strengthening Ṣukūk liquidity will not only increase market participation but also position Nigeria as a competitive player in the global Islamic sustainable finance ecosystem.

The lack of a well-developed secondary market for Green Ṣukūk means that investors may be forced to hold these instruments until maturity, limiting market dynamism and discouraging participants who seek liquidity in their investment portfolios. Unlike conventional bonds, which are actively traded on platforms such as the Nigerian Exchange (NGX) and the FMDQ Securities Exchange, Ṣukūk lack a dedicated trading infrastructure (Olawale & Yusuf, 2022). The absence of specialised Ṣukūk trading platforms and regulatory incentives for secondary market participation further constrains liquidity, making these instruments less attractive to institutional and retail investors alike.

Additionally, the absence of active market makers and robust Ṣukūk trading platforms restricts price discovery and bid-ask spread efficiency, further affecting the attractiveness of Green Ṣukūk compared to conventional green bonds. In mature markets such as Malaysia and the UAE, designated market makers facilitate Ṣukūk liquidity by continuously quoting buy and sell prices, reducing volatility and improving tradability (IIFM, 2023). Nigeria's lack of market-making mechanisms limits investor confidence and increases the cost of entry and exit, making Green Ṣukūk less competitive in the broader sustainable finance market

**E. Perceived High-Risk Nature of Green Projects**

One of the major barriers to financing green infrastructure through Green *Ṣukūk* in Nigeria is the perception of high investment risks associated with renewable energy, climate adaptation, and other sustainability-focused projects (Eguavoen, 2021). Investors view green infrastructure initiatives as capital-intensive and long-term, requiring extended gestation periods before yielding returns. For instance, solar and wind energy projects in Nigeria typically require an initial capital outlay of $1.5–$3 million per megawatt, with payback periods exceeding 10 years (African Development Bank, 2023). These long-term financial commitments deter short-term investors, particularly in the absence of government-backed incentives or credit enhancement mechanisms.

Additionally, regulatory bottlenecks – including delays in project approvals, land acquisition challenges, and inconsistent environmental policies – create uncertainties that further discourage institutional investors from committing funds to Green Ṣukūk. For instance, Nigeria's 2021 Energy Transition Plan outlined ambitious renewable energy targets, yet bureaucratic delays in environmental impact assessments (EIA) and land-use approvals have slowed solar and wind farm developments by an average of 12–18 months (Federal Ministry of Environment, 2023). These regulatory inefficiencies increase project costs and deter large-scale investment in Green Ṣukūk-backed infrastructure.

The lack of adequate de-risking mechanisms – such as government-backed credit enhancements, liquidity facilities, or guarantees – exacerbates investor concerns about potential financial losses, making traditional fixed-income securities appear more attractive. By contrast, Malaysia's Green Ṣukūk framework includes sovereign guarantees and risk-sharing models supported by the Malaysia Green Technology Corporation (Securities Commission Malaysia, 2023). Similarly, Indonesia has implemented tax incentives for Green Ṣukūk investors and established climate-focused sovereign guarantees, reducing perceived investment risks (Ministry of Finance Indonesia, 2023). Adopting similar de-risking measures in Nigeria would significantly enhance Green Ṣukūk's attractiveness to institutional investors.

Moreover, the absence of reliable environmental impact assessment (EIA) frameworks and clear performance measurement metrics complicates risk assessment and due diligence processes for investors (Hassan & Lewis, 2023).

Without robust risk mitigation strategies, including Sharī'ah-compliant credit enhancement schemes, blended finance models, and sovereign guarantees, Green Ṣukūk may struggle to attract large-scale institutional investors and private sector participation. To overcome these challenges, Nigeria should: (i) Introduce sovereign-backed credit guarantees to reduce default risks, (ii) Develop a Green Ṣukūk de-risking facility to attract private sector capital, and (iii) Enhance policy consistency through long-term regulatory commitments to green finance. These measures would not only de-risk Green Ṣukūk investments but also establish Nigeria as a competitive player in Islamic sustainable finance markets.

**Prospects of Financing Green Infrastructure through Ṣukūk in Nigeria**

The issuance of Green Ṣukūk is consistent with Nigeria's broader climate and sustainability goals, particularly its commitments under the Paris Agreement and its Nationally Determined Contributions (NDCs) to reduce carbon emissions by 47% by 2030 with international support (Federal Ministry of Environment, 2023). However, achieving these targets requires an estimated $10 billion in annual climate financing, highlighting the urgent need for alternative funding sources (African Development Bank, 2023). Green Ṣukūk provide a strategic tool for mobilising resources towards eco-friendly infrastructure, ensuring that environmental sustainability remains a major focus of national economic planning. The Nigerian Climate Change Act (2021) further provides a strong policy framework for promoting sustainable finance, making Green *Ṣukūk* a strategic tool for mobilising resources towards eco-friendly infrastructure. This policy foundation allows Nigeria can effectively integrate Green *Ṣukūk* into its broader climate financing strategies, ensuring that environmental sustainability remains a major focus of national economic planning.

The global shift towards ethical investing and the rising demand for Environmental, Social, and Governance (ESG)-compliant assets present a unique opportunity for Nigeria to attract international capital through Green Ṣukūk. By 2023, global ESG assets exceeded $35 trillion, with projections to reach $50 trillion by 2025, accounting for one-third of total assets under management (OECD, 2023). Many impact investors, development finance institutions, and multilateral agencies are actively seeking sustainable investment opportunities, and positioning Green Ṣukūk as a viable instrument will allow Nigeria to tap into this expanding pool of ethical capital. (OECD, 2023). Positioning Green *Ṣukūk* as a viable investment instrument allows Nigeria to tap into this growing pool of ethical capital, fostering increased participation from global stakeholders in its green finance initiatives.

Green Ṣukūk also holds significant potential for fostering Public-Private Partnerships (PPP) in Nigeria's infrastructure development. Indonesia's Green Ṣukūk model, for instance, has successfully mobilised over $6 billion since 2018, financing renewable energy, sustainable transport, and climate adaptation projects through a structured PPP framework (Ministry of Finance Indonesia, 2023). Similarly, Malaysia's Sustainable and Responsible Investment (SRI) Ṣukūk framework has attracted both domestic and foreign private sector investments into green infrastructure projects (Securities Commission Malaysia, 2023). Adopting a PPP-based Green Ṣukūk structure in Nigeria will enable the government to leverage private sector capital for large-scale projects, ensuring efficient project execution while mobilising additional resources.

Furthermore, the introduction of Green *Ṣukūk* can contribute to the expansion of Nigeria's Islamic capital market by increasing the availability of Sharī'ah-compliant investment instruments. This diversification can attract a wider range of investors, including international Islamic finance institutions

and sovereign wealth funds that prioritise ethical and sustainability-driven investments (IIFM, 2023). A more developed Islamic capital market will not only strengthen Nigeria's financial ecosystem but also position it as a regional hub for Islamic sustainable finance. With global Green Ṣukūk issuances exceeding $40 billion (IIFM, 2023), Nigeria has a strategic opportunity to integrate its Islamic finance industry into the expanding ESG investment landscape. By developing a well-structured Green Ṣukūk framework, Nigeria can enhance investor confidence, attract long-term green investments, and align its financial sector with global sustainability standards.

**Conclusion and Recommendations**

The adoption of *Ṣukūk* as a financing mechanism for green infrastructure presents a viable and Sharī'ah-compliant alternative to traditional debt-based financing in Nigeria. This study has established that while green infrastructure development is essential for addressing Nigeria's environmental and urbanisation challenges, its financing remains a significant constraint. *Ṣukūk*, particularly Green *Ṣukūk*, offer a scalable and ethical financing model that conforms with Islamic financial principles, global sustainability goals, and Nigeria's climate adaptation commitments under the Paris Agreement and the United Nations Sustainable Development Goals (SDGs). However, despite Nigeria's expanding Islamic finance ecosystem, Ṣukūk remain underutilised for green projects due to regulatory constraints, limited market depth, and low investor awareness.

Case studies from Malaysia and Indonesia demonstrate that Green Ṣukūk can successfully mobilise capital for large-scale sustainability projects when supported by a dedicated legal framework, strong public-private partnerships (PPPs), and Government-backed risk mitigation strategies.

To harness the full potential of Ṣukūk for green infrastructure development, this study recommends:

a. developing a Green Ṣukūk regulatory framework under the Securities and Exchange Commission (SEC) and Central Bank of Nigeria (CBN);
b. introducing tax incentives and risk-sharing instruments, such as sovereign-backed credit guarantees, to attract institutional investors;
c. expanding secondary market liquidity by integrating Green Ṣukūk into the Nigerian Exchange (NGX) and FMDQ Securities Exchange; and
d. enhancing public-private partnerships (PPPs) to drive Ṣukūk-based financing for renewable energy, climate adaptation, and conservation projects.

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