The Role of Green Sukuk in Promoting Sustainable and Environmentally Responsible Investment: Malaysia as a Model

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Abstract:

The objective of this study is to explore the effectiveness of green sukuk as an innovative Islamic financial instrument in supporting environmentally responsible investments and promoting sustainable development. The study adopts a descriptive and analytical methodology, relying on data collected from previous research and official reports, as well as an in-depth analysis of Islamic financial instruments used in Malaysia. The findings reveal that Islamic finance, particularly green sukuk, plays a significant role in financing renewable energy and environmental initiatives. The most important recommendation of the study is to strengthen collaboration between governments and Islamic financial institutions to develop innovative green financing mechanisms that support long-term sustainable development.

Keywords:green sukuk; sustainable development; Environmentally; green financing; renewable energy

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1. INTRODUCTION

Amid intensifying environmental challenges and the growing global emphasis on achieving sustainable development, Islamic finance has emerged as a contemporary, value-driven financial system with the potential to support environmentally responsible investments. Rooted in Shariah principles, Islamic finance incorporates ethical, social, and ecological dimensions, making it well-suited to fund projects that promote both social welfare and environmental protection. It provides a viable solution to help close the financing gap needed to realize the Sustainable Development Goals.

Sustainable development has become a central objective for nations and communities striving to achieve a balanced approach to economic growth, environmental preservation, and social inclusion. Among the most critical environmental goals are mitigating climate change, conserving terrestrial and marine ecosystems, and ensuring universal access to clean and renewable energy sources. Within this framework, environmentally responsible financing plays a pivotal role in channeling financial resources into projects that improve environmental quality and enhance overall human well-being.

Islamic finance offers a variety of Shariah-compliant instruments such as green sukuk, musharakah, and mudarabah, that align ethical values with environmental objectives. These instruments provide effective financial mechanisms that support sustainable development while avoiding many of the systemic risks associated with conventional financial systems. Several countries have successfully adopted Islamic financial tools for environmental purposes, illustrating their practical value and adaptability.

Malaysia represents a pioneering model in the integration of Islamic finance with sustainability efforts. The country has developed a robust legal and regulatory framework to support the issuance of Shariah-compliant financial instruments. In July 2017, Malaysia launched its first green sukuk through Tadau Energy, raising MYR 250 million (approximately USD 58 million) to finance a solar energy project. This marked a significant milestone in aligning Islamic finance with climate goals. Since then, Malaysia has expanded its green sukuk market and reaffirmed its commitment to reducing greenhouse gas emissions by 45% of GDP by 2030, positioning itself as a global leader in sustainable Islamic finance.

This study is significant in that it investigates green sukuk as an innovative and ethical financial instrument within the broader Islamic finance ecosystem. It focuses on Malaysia as a case study to demonstrate how Islamic finance can be mobilized to support renewable energy and environmentally sustainable infrastructure projects, offering insights that can be replicated by other countries seeking responsible financing models.

In light of the above, this study raises the following central question:

To what extent can green sukuk serve as an effective Islamic financial mechanism for funding environmentally responsible projects that contribute to sustainable development?

Hypotheses:

1. Islamic finance contributes to the funding of development projects that are environmentally responsible.

2. Green sukuk represent a practical and Shariah-compliant tool for financing sustainability-focused initiatives.

This study employs a descriptive and analytical methodology appropriate to the nature of the topic. It includes a conceptual review of the principles of Islamic finance and an analysis of how these principles are applied to environmental project financing particularly through green sukuk. The research also examines successful case studies in Malaysia, focusing on their design, implementation processes, and outcomes.

2. Theoretical Framework of Green Sukuk and Sustainable Development

The theoretical foundation of green sukuk within the broader context of sustainable development revolves around examining how Islamic financial tools, particularly green sukuk, can contribute to financing environmentally sustainable initiatives. (Arqoub, 2017) These instruments are rooted in Islamic finance principles and are designed to support the transition toward green economies by channeling funds into responsible projects. (AYUB M. , 2002)

2.1. The Nature of Green Islamic Sukuk

To understand green Islamic sukuk, it is first important to grasp the underlying concept of green bonds. The term "green bond" was first applied in 2008 amounting to 3.35 billion Swedish krona (approximately USD 440 million). when a major issuance took place, driven by growing global concern about climate change and the desire to fund climate-related projects. This issuance was driven by three main motivations, as: (El-Sayed, p. 733)

Responding to demand from Scandinavian pension funds, which sought to support projects focused on climate-related activities through a simple, fixed-income productaligning with the World Bank’s efforts to meet the needs of investors interested in sustainable and responsible investment.

Supporting the World Bank’s strategy to introduce innovative financial products that fund climate-focused initiatives.

Raising awareness among investors and financial stakeholders about how developing countries can take action consistent with climate change objectives (El-Sayed, p.734)

As for green Islamic sukuk, the concept emerged for the first time in France in 2012, and has since attracted significant attention. The Islamic Development Bank had previously committed substantial investmentsup to USD 1 billionin clean energy sectors across countries such as Morocco, Pakistan, Egypt, Tunisia, and Syria. In early 2013, Malaysia witnessed its first issuance of green sukuk as part of a broader USD 1.5 billion Islamic sukuk program. (Hanan, 2015,p.235)

Green Islamic sukuk derive their name from their dual nature: they are Shariah-compliant financial instruments issued specifically to fund environmentally focused projects. They are

considered the Islamic finance counterpart to conventional green bonds, typically issued by governments, private sector entities, commercial banks, or international financial institutions.

The expansion of green Islamic sukuk is gaining momentum due to the growing awareness of both Islamic finance tools and environmental sustainability. Funds raised through green sukuk are often allocated to eco-friendly projects, such as those providing clean energy and sustainable infrastructure.

2.1.1The Concept of Green Sukuk

Islamic finance is based on a legal and ethical framework that prohibits interest (riba), speculative transactions (gharar), and investments in activities that are considered socially or environmentally harmful. It promotes financing that serves the public good and aligns with moral and developmental objectives. (AYUB, 2002)

Green sukuk are specialized financial instruments that conform to Shariah principles and are used specifically to finance green projects. They provide investors with assurance that their funds are being directed toward environmentally sustainable. Funds raised through green sukuk are typically allocated to tangible, identifiable assets such as renewable energy installations or environmentally focused public infrastructure (Arqoub, 2017p.7)

According to the World Bank, green sukuk offer investors a high level of confidence that their funds will be used for a specific environmental purpose. In line with the core principles of Islamic finance, the funds raised through sukuk issuance are directed toward identifiable assets and projects, such as renewable energy initiatives. These instruments have the potential to expand the Islamic finance market, bridge the gap between conventional and Islamic finance, and attract conventional investorsprovided they generate competitive, risk-adjusted returns and are properly marketed.

These instruments bridge the gap between Islamic and conventional finance, appealing to both faith-based and ethically motivated investors. When well-structured, green sukuk can attract broader investment by offering competitive returns while maintaining environmental integrity. Their use also helps expand the scope of Islamic capital markets and supports global sustainability agendas (Visser, 2009,p.67)

Moreover, green sukuk are Islamic financial tools that channel funds into eco-friendly projects, including solar power plants, water treatment facilities, and waste management initiatives. These sukuk adhere to Islamic legal principles while supporting financing activities that promote environmental protection (Andreas Jobst, 2012,p,27).

2.1.2 Drivers Behind the Adoption of Green Sukuk

A growing number of investors are seeking environmentally sustainable investment options.

Rapid growth in the Islamic sukuk market globally.

Traditional banks often refrain from financing large-scale infrastructure projects due to stringent capital requirements.

2.1.3 Application Areas of Green Sukuk

Green sukuk can be effectively used to finance projects that are environmentally productive and contribute to long-term sustainability. These projects may originate from governments, financial institutions, or private enterprises. Key sectors include:

Sustainable Transportation: Financing eco-friendly transportation networks, electric or hybrid vehicles, and mass transit infrastructure that reduce emissions and improve urban mobility. (Arqoub, 2017,p.11).

Renewable Energy Projects: Supporting investments in solar, wind, hydroelectric, and geothermal energy systems. For instance, governments can issue mudarabah-based sukuk to fund solar plants or manufacturing units (Hanan, 2015,p.235).

Green Technology Initiatives: Financing environmentally sound technologies that reduce emissions and enhance energy efficiency (Visser, 2009)

Public Benefit Infrastructure: Supporting green housing, eco-bridges, water systems, and public infrastructure projects that comply with Shariah and meet environmental goals. (Andreas Jobst, 2012)

2.2. Sustainable Development

2.*2.*1Concept of Sustainable Development:

The concept of sustainable development was first formally introduced in the 1987 report by the World Commission on Environment and Development, chaired by the Prime Minister of Norway, Gro Harlem Brundtland, under the title "Our Common Future". It defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Aref, 1987, p. 69).

William Ruckelshaus, former administrator of the U.S. Environmental Protection Agency, described it as a process that promotes economic growth in line with environmental capacities, meeting the needs of the present generation without compromising the ability of future generations to meet their own, while preserving natural assets for future growth and development (Al-Buraidi, 2015).

Sustainable development is thus an ongoing economic and social development process that does not compromise the quality of natural resources used in human activities. It is a balanced development that encompasses various societal activities by adopting optimal strategies to invest in both material and human resources. It also embraces the principles of equity in production and consumption to ensure well-being for all members of society without harming the interests of future generations.

2.1.2Objectives of Sustainable Development:

- Ensuring economic growth
- Achieving equity and social justice
- Protecting the environment
- Ensuring balance between economic, social, and environmental needs

- Integrating modern technologies with societal goals
- Preserving the environment and promoting awareness of cultural, social, and urban aspects
- Combating all forms of environmental pollution and depletion
- Using clean technologies
- Promoting biodiversity and preserving biological diversity

2.1.3Dimensions of Sustainable Development:

Sustainable development combines three main, interrelated dimensions that form its foundational pillars:

Economic Dimension: According to (mostapha, 2007, pp.29-30), this includes:

- Halting resource depletion
- Reducing the dependency of developing countries
- Holding developed nations accountable for pollution and its mitigation
- Promoting fair distribution of resources and reducing income inequality

Social Dimension: As outlined by (Mohamed, 2012, pp. 32–33), this involves:

- Stabilizing population growth and ensuring balanced distributionOptimal use of human resources.
- Ensuring access to health and education services.

Environmental Dimension:
identifies the following key elements: (mostapha, 2007,p.14)

- **Protecting natural resources:** This includes soil preservation, minimizing excessive use of pesticides and chemical fertilizers, and conserving fishery resources using methods that enhance resource productivity.

- **Preserving the aquatic environment:** Focuses on maintaining water quality, reducing wasteful water use, and improving water supply networks.

- **Maintaining biodiversity:** Sustainable development aims to protect ecosystems, forests, and unique habitats from rapid destruction and deterioration.

- **Combating global warming:** It seeks to mitigate the emission of harmful greenhouse gases that destabilize the climate and destroy the ozone layer, thereby protecting all living organisms.

2.1.4**The Role of Islamic Finance in Achieving Sustainable Development Goals:**

Islamic finance integrates environmental, social, and governance (ESG) factors into investment decisions, contributing to the achievement of sustainable development goals by supporting projects that promote environmental preservation and enhance quality of life. (Report, 2018, p.52)

Islamic finance plays a vital role in achieving sustainable development goals through the application of Shariah principles, which emphasize social justice and long-term economic development. Its contributions include:

Supporting Sustainable Economic Projects: Islamic finance encourages investment in socially and environmentally beneficial projects, such as green sukuk that focus on environmental protection. (Usmani, 1999,p. 71)

Nhancing Social Justice: Through profit-and-loss sharing mechanisms, Islamic finance promotes equitable wealth distribution between investors and beneficiaries.(AYUB M. , 2002, p ;83)

Encouraging Socially-Driven Finance: Islamic finance supports initiatives aimed at improving living conditions, including education, healthcare, and infrastructureall in alignment with the Sustainable Development Goals (SDGs). (Visser, 2009*, p. 91*).

Promoting Transparency and Accountability: It enhances trust and sustainability by promoting fair financial practices and transparent transactions. (Khan, 1995*, p. 104*)

Fostering Sustainable Economic Development: Islamic finance emphasizes long-term, productive investments over short-term gains, reinforcing economic sustainability. (Usmani, 1999, p. 120)

2.3. The Role of Islamic Finance in Supporting Environmental Projects

Islamic finance offers a range of instruments that can be effectively utilized to support environmental initiatives while remaining fully compliant with Shariah principles. Among these tools, green sukuk stand out as a mechanism designed to mobilize capital for projects that aim to reduce environmental harm and enhance sustainability. These sukuk avoid interest-based returns and instead focus on investments that align with ethical and environmental values (Usmani, 1999, p.72)

Another key tool is environmental murabaha, which involves financing eco-friendly assets through transparent cost-plus arrangements. This structure ensures fairness and avoids exploitative interest while supporting green infrastructure development (AYUB M. , 2002, p. 85)

Mudarabah can be adapted to fund sustainable ventures by allowing profit-sharing partnerships between capital providers and project developers. This approach distributes both risk and reward, encouraging collaboration in projects such as clean energy or waste management (Visser, 2009, p. 100).

Islamic finance also facilitates investment in renewable energy, including solar and wind technologies, which reflects the Islamic value of environmental stewardship and the responsible use of natural resources (Khan, 1995, p. 108)

zakat and charitable endowments (waqf) provide an opportunity to support environmental protection, especially in underserved communities. These funds can be allocated to awareness

campaigns, conservation efforts, or access to clean water, fulfilling the broader Islamic objective of promoting social welfare (Usmani, 1999, p. 115)

Shariah emphasizes principles such as moderation, non-wastefulness, and care for creation, offering a moral foundation for sustainable behavior and green finance. These values, drawn from Islamic teachings, encourage the responsible use of resources and support long-term ecological balance (Visser, 2009,p. 125)

3. Financing Renewable Energy Projects through Green Sukuk: The Case of Malaysia

Within the framework of the 2030 Sustainable Development Agenda and the Paris Climate Agreement, which aim to promote the transition towards a green economy and mitigate climate change, sustainability has been increasingly integrated into the banking sector. This integration is evident in the development and promotion of new financial instruments that are environmentally and climate-friendly, most notably green sukuk.

3.1. The Reality of Green Sukuk in Malaysia

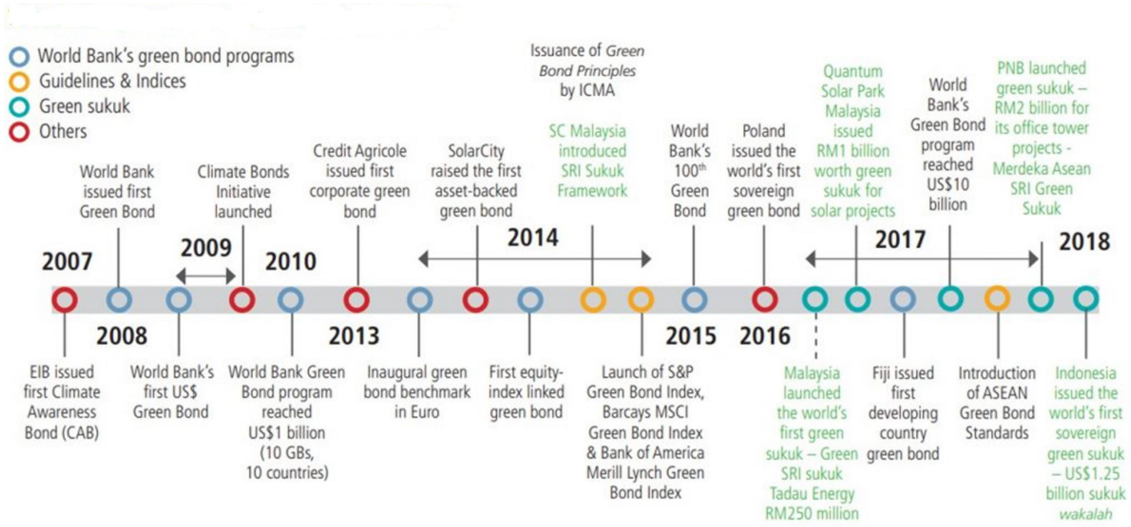
Green sukuk represent an innovative Islamic financial product that enables issuers to utilize proceeds for financing environmentally and climate-related projects. These include renewable energy, sustainable waste management, and smart urban infrastructure initiatives. Such sukuk combine Shariah compliance with sustainable investment principles, attracting both Islamic finance stakeholders and sustainability-conscious investors. Additionally, green sukuk raise awareness of environmental concerns and reinforce efforts to combat climate-related challenges.

Countries such as Malaysia, Indonesia, Turkey, GCC members (Bahrain, Saudi Arabia, UAE, Oman), the Islamic Development Bank, and several African nations have emerged as prominent issuers of green sukuk (IIFM, 2018, p. 120).

In 2022, the global green sukuk market saw renewed momentum, with 53 sukuk issued, valued at approximately USD 44 million, by nine entities, including Malaysia and GCC countries. Historically, green bonds witnessed significant growth, reaching USD 155 billion in issuances in 2017, with expectations to surpass USD 1 trillion by 2020.

Malaysia pioneered the green sukuk initiative by issuing the world's first SRI green sukuk in July 2017 through Tadau Energy. By April 2018, five green sukuk had been launched in Malaysia with an approved issuance size of MYR 3.7 billion, of which MYR 2.4 billion was dedicated to green buildings and renewable energy.

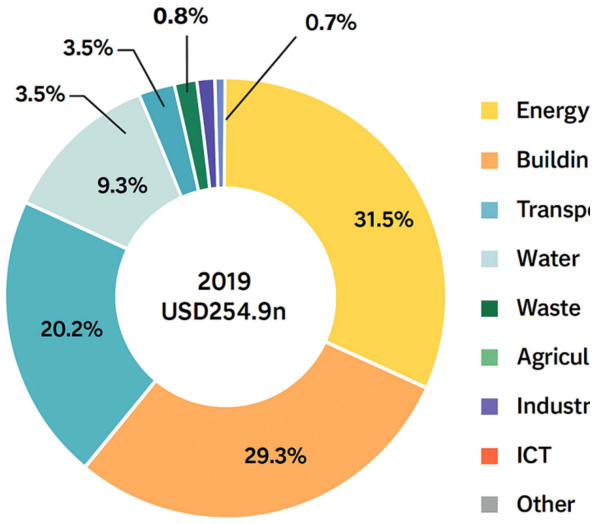
Fig.1. Development of the Green Bonds and Sukuk Market (2007–2018)



Source: (group, 2019, p. 27)

The energy sector, especially renewable energy, continues to attract substantial green sukuk funding, due to its capital-intensive nature and increasing demand driven by population growth and sustainability goals. In 2019, 31% of sukuk proceeds were allocated to renewable energy projects.

Fig.2. Allocation of Green Sukuk Proceeds by Sector



Source: (bonds, 2019)

3.2. Malaysia's Contribution to Financing Renewable Energy through Green Sukuk

As a global leader in Islamic finance, Malaysia has actively pursued its 2030 sustainable development goals, including the following climate targets:

✍ Pledging to reduce greenhouse gas emissions by 45% by 2030 via climate finance, capacity building, and technology transfer.

✍ Financing seven renewable energy projects (five solar, two hydropower) through green sukuk.

✍ Issuing the world's first green sukuk by Tadau Energy (MYR 250 million) to fund a 50 MW solar plant in Sabah.

✍ Quantum Solar Park issuing MYR 1 billion in October 2017 to finance three 50 MW solar photovoltaic plants in Kedah, Melaka, and Terengganu.

✍ PNB Merdeka Ventures launching a MYR 1 billion green sukuk for constructing the Merdeka 118 Tower in Kuala Lumpur.

✍ Sinar Kamiri issuing MYR 240 million in January 2018 for a 49 MW solar facility.

✍ UiTM Solar Power (Universiti Teknologi MARA) issuing MYR 240 million in April 2018 for a 50 MW solar plant in Pahang.

✍ By 2019, ten additional countries entered the green bond market, including Malaysia, Argentina, Chile, Fiji, Lithuania, Nigeria, Singapore, Slovenia, Switzerland, and the UAE.

✍ In 2020, global green sukuk issuances totaled USD 220 billion.

Table 1: Green Sukuk Issuance in Malaysia for Renewable Energy Projects

Issuer	Value (USD million)	Date	Project Description
Tadau Energy	58.4	27/07/2017	50 MW solar plant in Sabah
Quantum Solar Park	235.9	06/10/2017	Three 50 MW solar plants in Kedah, Melaka, Terengganu
PNB Merdeka Ventures	169.9	29/12/2017	Office space in Merdeka PNB118 Tower, Kuala Lumpur
Sinar Kamiri	62.8	30/01/2018	49 MW solar plant in Perak
UiTM Solar Power	56.6	27/04/2018	50 MW solar plant in Pahang
Pasukhas Green Assets	4.2	28/02/2019	Hydropower project
Telekosang Hydro	112.1	06/08/2019	Hydropower project
Leader Energy	62.7	16/07/2020	Solar energy project

Source :(Malaysia, 2020, p. 32)

3.3. Malaysia's Incentives to Promote Green Sukuk Issuance

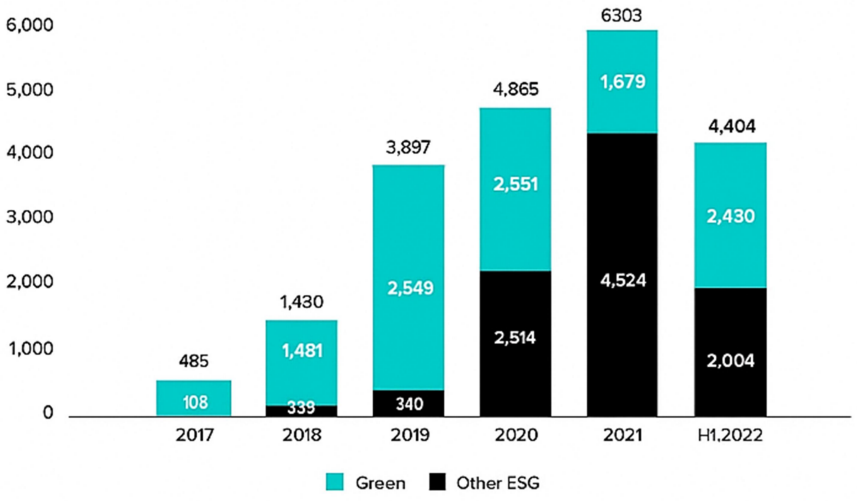
To foster green sukuk development, Malaysia has introduced a comprehensive set of incentives (IIFM, 2018):

- Tax deduction on issuance costs;
- Income tax exemption for issuers;
- Tax incentives for green activities in energy and waste sectors;
- Financial support via the Green Technology Financing Scheme, with RM 5 billion allocated in 2022;
- A Green SRI Sukuk Grant Scheme worth RM 6 million, managed by Capital Markets Malaysia.

The total global sukuk issuances reached USD 198.5 billion, while bond issuances stood at USD 429 billion in 2022. Green sukuk accounted for USD 4.4 billion, or 1% of global bond issuance and 4% of sukuk issuance. In 2021, they reached USD 6.1 billion. However, their share dropped to 26% in 2021 from 52% in 2020 and 91% in 2019. The GCC and Indonesia represented 53% of total green sukuk issuances, with new issuers including Turkey, Sudan, Bangladesh, and Nigeria.

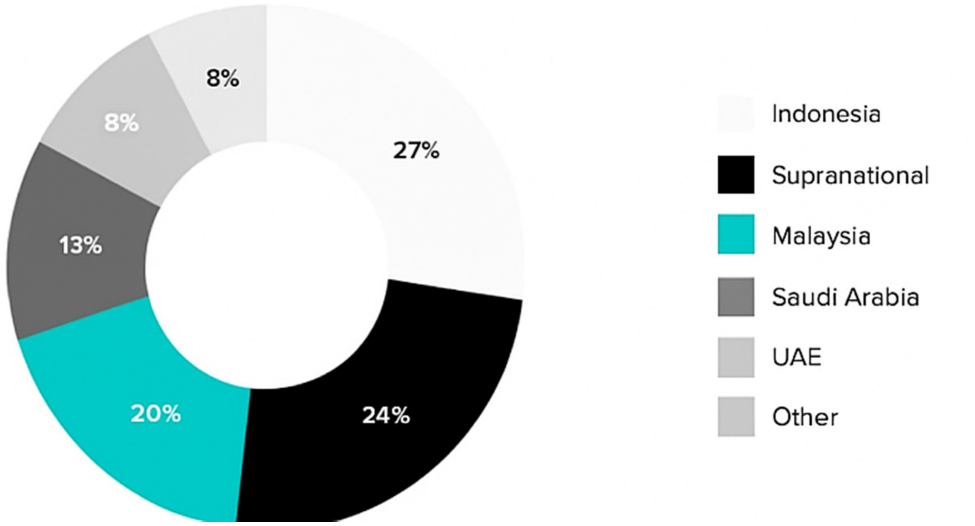
Malaysia continued to lead the market, contributing 20% of global issuance, followed by Saudi Arabia at 13%.

Fig.3. Total Global Green Sukuk Issuance in 2022 (USD million)



Source:(Green Sukuk Report, 2022, p. 15)

Fig.4. Country Distribution of Sukuk Issuance in 2022



Source:(Green Sukuk Report, 2022, p. 8)

As for Algeria, Within the framework of its energy transition, digital economy, and knowledge-based development strategy, and following the integration of Islamic finance instruments, Algeria stands to benefit significantly from utilizing green sukuk to finance its renewable energy sector particularly considering its vast geographic area and immense solar energy potential.

4. CONCLUSION

Strengthening its role in supporting environmental projects requires cooperation between governments, financial institutions, and non-governmental organizations to develop policies and frameworks that support these goals. Green sukuk, in particular, offer a significant opportunity to expand the role of Islamic finance in environmental and developmental initiatives. These are Shariah-compliant investments aimed at addressing climate change and environmental preservation, such as renewable energy projects and other green assets.

Renewable energy projects in many countries require investments worth billions of dollars, making them a promising avenue for Islamic finance especially green sukuk to contribute meaningfully and offer a viable Islamic alternative in the global financial landscape. Although some countries have witnessed notable growth in this area, several challenges remain that need to be addressed to broaden the adoption of this instrument in Islamic markets.

Malaysia is among the leading countries in issuing sukuk. It has successfully developed a thriving Islamic financial market that actively supports environmental projects, such as renewable energy and waste management initiatives. The country has made significant progress in utilizing green sukuk as a financing tool for renewable energy projects, thereby contributing to the achievement of sustainable development goals. This experience offers a replicable model for other countries seeking to harness Islamic finance for environmental sustainability.

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