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Cooperation of the Organization of Islamic
Cooperation (COMCEC)**

**Promoting Sustainable and Environmentally Friendly
Islamic Financial Instruments to Combat the Adverse Effects
of Climate Change and Natural Disasters
in the OIC Member Countries**



**COMCEC COORDINATION OFFICE
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ABBREVIATIONS

AAOIFI	: Accounting and Auditing Organization for Islamic Financial Institutions
BAZNAS	: Badan Amil Zakat Nasional [National Board of Zakat, Indonesia]
BIS	: Islamic Bank of Senegal
BMT	: Baitul Maal wat Tamwil
BoP	: Balance of Payments
BPRS	: Bank Pembiayaan Rakyat Syariah (Indonesia)
BPS	: Badan Pusat Statistik (Indonesia)
BUS	: Bank Umum Syariah (Indonesia)
CBA	: Central Bank of Azerbaijan
COMCEC	: Standing Committee for Economic and Commercial Cooperation of the Organization of the Islamic Cooperation
CSR	: Corporate Social Responsibility
FDR	: Financing to deposit ratio
FMCG	: Fast-moving consumer goods
GCC	: Gulf Cooperation Council
GDP	: Gross Domestic Product
ICD	: Islamic Corporation for the Development of the Private Sector
IDR	: Indonesian Rupiah
IFSB	: Islamic Financial Services Board
IIFM	: International Islamic Financial Market
IIH	: Islamic Investment House
ILO	: International Labour Organization
IMF	: International Monetary Fund
IsDB	: Islamic Development Bank
ITFC	: International Islamic Trade Finance Corporation
KOBİA	: Küçük ve Orta İşletmelerin Geliştirilmesi Ajansı [Small and Medium Business Development Agency]
LIPI	: Lembaga Ilmu Pengetahuan Indonesia [Indonesian Institute of Sciences]
MESA	: Middle East and South Asia
MFI	: Microfinance institutions
MSMEs	: Micro, small and medium-sized enterprises
NBFIs	: Non-bank financial institutions
NOM	: Net Operating Margin
NPF	: Non-performing financing
NPL	: Non-performing loan
OECD	: Organisation for Economic Co-operation and Development
OIC	: Organisation of Islamic Cooperation
OJK	: Otoritas Jasa Keuangan [Indonesian Financial Services Authority]
PAP2A	: Adjusted and Accelerated Priority Action Plan
PEBS	: Pusat Ekonomi dan Bisnis Syariah
PLS	: Profit and loss sharing
PNM	: PT Permodalan Nasional Madani

PSE	:	Plan Senegal Emergent
RFI	:	Rapid financing instrument
ROA	:	Return on Assets
ROE	:	Return on Equity
SESRIC	:	Statistical, Economic and Social Research and Training Centre for Islamic Countries
SMEs	:	Small and medium-sized enterprises
UAE	:	United Arab Emirates
USSR	:	Union of Soviet Socialist Republics
UUS	:	Unit Usaha Syariah (Indonesia)
WHO	:	World Health Organization
WTO	:	World Trade Organization
YoY	:	Year-over-year

EXECUTIVE SUMMARY

Climate change poses a serious threat to sustainable development, especially in Organisation of Islamic Cooperation (OIC) Member Countries, many of which are vulnerable to environmental shocks. This report examines the potential of Islamic finance as a transformative tool to tackle climate change and disaster risk management, focusing on five diverse countries: Azerbaijan, Indonesia, Nigeria, Qatar, and the United Kingdom. These countries represent different geographical, economic, and Islamic finance development contexts, providing valuable insights for shaping effective climate policies.

The report aims to:

- (i) Analyse the evolution and utilisation of Islamic green finance instruments targeting climate change and natural disasters.
- (ii) Examine global trends in Islamic sustainable finance and compare them with the performance of conventional markets vis-à-vis climate change and natural disaster risk management and financing.
- (iii) Assess the best practices, ongoing initiatives, risks, and challenges in both OIC Member Countries and non-OIC countries.
- (iv) Identify the main stakeholders and their roles in fostering collaboration for advancing green finance.
- (v) Offer policy recommendations to bolster the growth of the Islamic green finance market
- (vi) Develop a structured roadmap to accelerate the adoption of sustainable finance in OIC Member Countries, with a particular emphasis on climate risk and natural disaster risk management and financing.

Aligned with the report's objectives, the first chapter thoroughly examines green finance, emphasising its growing significance in tackling climate risks and natural disaster challenges. It starts by defining core principles of green finance and connecting it to the Sustainable Development Goals (SDGs), highlighting its role in fostering environmentally sustainable economic growth. The chapter reviews global trends, noting the expansion across different sectors and increased commitments from financial markets and policymakers. Additionally, it details various funding models for green initiatives, grouping them by recipient sectors and financial strategies.

Chapter 1, hence, addresses major challenges faced in the global rollout of green finance initiatives, covering regulatory, financial, and operational hurdles. It also examines the roles of key stakeholders, including multilateral organisations, development banks, and private sector entities, highlighting potential collaboration avenues. In conclusion, the chapter draws lessons from successful international practices and examines how these insights can be applied in the Islamic finance sector to enhance green financing through Shariah-compliant approaches.

Chapter 2 provides a detailed analysis of how Islamic finance can assist in addressing climate risks and boosting preparedness for natural disasters. It begins with an overview of the theoretical foundations of Islamic finance principles and their importance in reducing financial risks associated with climate change. The chapter highlights the progress made across various sectors within OIC Member Countries and pinpoints key areas where green finance projects have made a significant impact and experienced growth. It also evaluates the effectiveness of Islamic green finance instruments compared to conventional ones in promoting sustainability.

Furthermore, the chapter examines the main challenges that OIC Member Countries encounter in implementing green finance, such as regulatory, financial, and institutional barriers. It briefly discusses the roles of multilateral organisations, industry participants, and other key entities in advancing green finance initiatives. Finally, the chapter explores the potential of Islamic social finance tools to support green finance efforts.

The selected countries—Indonesia, Nigeria, Azerbaijan, Qatar, and the UK (which is not an OIC member)—are analysed using secondary sources like reports and policy documents, as well as primary data from interviews with key individuals related to the subject matters in these countries. This method aims to gain a thorough understanding of the issues covered in previous chapters. These countries were selected due to their advancements and initiatives in sustainable finance, climate risk mitigation, and the utilisation of Islamic financial tools for green projects.

Chapter 4 offers specific policy recommendations and a roadmap for Islamic green financing, with a focus on mitigating climate risk and enhancing natural disaster readiness. These recommendations serve as a practical guide to assist OIC Member Countries in building a climate-resilient economy. Each suggestion is straightforward, actionable, and designed to achieve clear outcomes. In addition, the chapter provides explanations for each recommendation to foster best management practices across all OIC Member Countries, promote knowledge sharing, and strengthen the role of Islamic finance.

The roadmap provides a detailed, step-by-step guide to help Member Countries maximise the benefits of Islamic green finance models. Given the diverse approaches and considerations for Islamic finance among OIC Member Countries, these differences are considered when formulating policy recommendations and the roadmap. The policy suggestions include both short-term and long-term strategies. Short-term recommendations are mainly based on existing results, whereas long-term recommendations are structural and aligned with the overall findings.

Policy recommendations drawn from the research presented in this report for advancing sustainable and eco-friendly Islamic financial instruments in OIC Member Countries to address climate change and natural disasters are as follows:

Legal and Regulatory Frameworks:

OIC countries should implement harmonised, transparent regulations that support green Islamic finance and formally recognise climate risks and sustainability goals. To do this, strengthening regulatory and supervisory frameworks is essential, including creating specific regulations for green and climate-linked Islamic finance like green sukuk, aligning with international ESG standards, and integrating climate risk assessments into financial oversight. Addressing legislative and technical gaps for green sukuk issuance is also vital—this entails defining eligible projects, standardising reporting, and requiring third-party verification. Finally, green sukuk should be integrated into the financial agenda by mandating their inclusion alongside ESG-linked products in national financing strategies to promote sustainable development.

Product and Market Development:

Market-driven innovation, product diversification, and clear frameworks for new green Islamic instruments are crucial to meet climate finance needs and attract private investment. To further unlock the corporate sukuk market, it is important to support green sukuk issuance by streamlining processes, enhancing market education, and establishing clear pipelines for eligible green projects. Encouraging innovation in Islamic financing contracts and sukuk

structures, such as resilience-linked sukuk and ESG-compliant musharakah or murabaha, can help address various climate adaptation and mitigation challenges. Developing new financing approaches, including blended finance, syndicated green loans, and unique risk-sharing models, will enable funding for climate solutions. Additionally, addressing the shortage of green Shari'ah-compliant products requires motivating financial institutions to create climate adaptation and resilience solutions, involving scholars and stakeholders in the product development process. To fill the gap of a syndicated green financing framework, standardised consortium models for large-scale green projects should be established, allowing Islamic banks to share risks and expand climate investments. Finally, creating and encouraging green and resilience-linked Islamic financial products will require fiscal or regulatory incentives, such as tax benefits or green asset ratios, to promote their adoption.

Capacity Building, Awareness, and Confidence:

Extensive efforts are essential to boost understanding among all stakeholders and develop the technical skills necessary for designing, marketing, and overseeing green financial products. This includes implementing specialised training programmes for Islamic banks, regulators, and investors that focus on green finance, climate risks, ESG reporting, and impact assessment. To combat limited awareness and public education on green finance, national campaigns should be launched, and climate finance topics should be integrated into Islamic finance curricula at both academic and professional levels. Additionally, to increase investor confidence, improving transparency, disclosure, and independent verification of green credentials for Islamic finance products is crucial, along with promoting success stories to build trust. Collaborating with international agencies, universities, and civil society is key to spreading knowledge and building expertise in this field.

Incentives and Partnerships:

Scaling up climate-aligned investments requires effective policy incentives and active collaboration among government, industry, and international stakeholders. This involves leveraging fiscal, macroprudential, and microprudential tools such as tax breaks, credit guarantees, and lower capital requirements to encourage banks and issuers to develop green Islamic finance products. Additionally, it is vital to address the lack of incentive mechanisms and promote cross-sector collaboration—whether through public-private partnerships or multilateral efforts—by establishing co-investment platforms that can de-risk climate projects and enable the sharing of best practices. Further, fostering cooperation among various ministries, Islamic financial institutions, and private sector participants is essential for building robust project pipelines and scaling green investments effectively.

Market Infrastructure and Impact Monitoring:

Enhancing market infrastructure and utilising technology will reinforce credibility, increase investor confidence, and expand access to sustainable Islamic finance. To improve the secondary market for green sukuk, it is vital to develop infrastructure like trading platforms and market-makers, which will boost liquidity and transparency and attract more investors. In addition, standardising reporting, impact assessments, and independent certification for green Islamic products will enhance accountability and clarity. Embracing technological innovations such as fintech, regtech, and blockchain is key to streamlining green product issuance, improving traceability, broadening access, and enabling impact measurement.

Paradigmatic Shift:

While expanding finance to bridge the gap in addressing climate risks and supporting disaster management is necessary, it is equally important to move away from global capitalism by adopting ethical and Islamic economic principles. Although the SDGs have value, they do not challenge the dominance of capital at the expense of environmental and climate concerns. Thus, a new understanding of capital and financing is needed—viewing them as tools for broader social and ethical goals aimed at creating a just, *ihsani* society. Islamic moral political economy aims to ensure all stakeholders' interests are acknowledged in production, consumption, and distribution, promoting core values and *mizan* (balanced order) to achieve stakeholder complementarity and unity or *tawhid*, which is central to Islamic moral economy. Therefore, in the short and medium term, developing Islamic finance within its institutional framework—while preventing convergence with conventional finance—is crucial for positively influencing climate risk management and zero-carbon strategies. Simultaneously, OIC Member Countries should consider gradually disentangling Islamic finance from global regulations to reduce convergence with conventional finance, which largely contributes to climate risks through reckless production, consumption, and distribution policies. Based on these findings, a gradual transition towards Islamic moral political economy practices—moving away from the financialisation of Islamic finance—would generate lasting benefits for the environment, climate, and natural disaster mitigation. Regulations and standards related to conventional finance should be limited and not imposed on Islamic finance. Instead, specific policies, regulations, and standards tailored for Islamic finance must be developed to ensure its efficient operation, with moral responsibility toward stakeholders beyond simple capital facilitation in line with *Shari'ah*.

In conclusion, these clustered recommendations can serve as a strategic roadmap to advance sustainable Islamic finance for climate resilience across the OIC, addressing both foundational and emerging gaps.

This research aimed to explore and shed light on how Islamic banks and financial institutions perform under VUCA conditions when addressing climate risks and natural disasters. It seeks to highlight best practices within the Islamic finance sector and explore ways to further develop Islamic banking and finance by emphasising Islamic principles and the substantive morality of Islam in economic and financial transactions. These principles include '*adalah*' (*justice*) and '*ihsan*' (ensuring equilibrium) so that *mizan* or balanced order can be sustained, which are integral to '*tawhid*'. The goal is to foster an '*ihsani* society' - a just society rooted in the concept of '*rahmat al alameen*' (mercy to all beings), ultimately contributing to a good society.

Efforts towards *ihsan* should be expedited so that *tawfik* (success) may be granted by Allah (swt).

INTRODUCTION

Aim, Objectives and the Scope of the Study

Climate change can pose significant macro-financial risks to the global economy and financial system (G20, 2021), highlighting the need for the Islamic finance industry to take necessary and prompt actions. The implications of climate change threaten ecosystems, biodiversity, and socio-economic structures across regions and sectors (IPCC, 2022), in varied economic repercussions (NGFS, 2021). This emphasises the importance of climate action as one of the Sustainable Development Goal objectives (SDG 13).

Climate risk can be categorised into two types: transition risks and physical risks (NGFS, 2022). Transition risk arises from policy, market, and technological changes toward a low-carbon economy, while physical risk originates from extreme climate-related events that directly affect financial assets. Within physical risk, there are two subcategories: *acute risks*, prompted by extreme climate events (e.g., floods, earthquakes, and wildfires), and *chronic risks*, stemming from long-term climate changes (e.g., rising temperatures and sea levels).

Muslim countries, especially in the Middle East, Africa, and Asia, face heightened climate risks due to their common characteristics as developing economies and geographical challenges, such as:

- Limited access to sustainable finance arises from structural constraints in financial markets and capacity limitations in supporting the transition to a low-carbon economy.
- Economic dependence on carbon-intensive sectors, such as the fossil fuel industry, complicates the transition to a greener economy.
- Macro-structural challenges, including socio-economic vulnerabilities that intensify climate-related risks;
- Possible spillover effects from the accelerated transition of advanced economies; and
- Diverse geographical landscapes prone to extreme weather events, such as floods, droughts, desertification, and earthquakes.

Given these challenges, policymakers in Islamic countries must take proactive measures to mitigate climate risks, promote sustainable economic growth, and reshape long-term outcomes for future generations. Simultaneously, findings from the Asian Development Bank and Islamic Development Bank report (ADB, 2022) indicate that Islamic financial instruments possess substantial untapped potential in advancing sustainable finance and climate resilience. A systematic approach, grounded in the industry's best practices, can assist in unlocking these opportunities for Islamic countries.

Climate Change Risk Landscape

Global climate action efforts continue to expand to ensure a timely, just, and orderly transition to net zero and to tackle climate risk, aligned with the United Nations' targets regarding the Paris Agreement. However, climate risks have escalated rapidly, as evidenced by 2024 being the hottest year on record, surpassing the 2023 temperature peak (World Meteorological Organization, 2024). Furthermore, extreme weather events have occurred across various countries due to climate change, as seen at the beginning of 2025: wildfires in Southern California, which recorded the most costly natural disaster in the US, and catastrophic floods in North Queensland, Australia, which have damaged infrastructure.

Muslim countries in various regions have encountered similar challenges due to the increased implications of climate change in recent years.

- MENA: severe heatwaves (e.g., Saudi Arabia during the 2024 hajj period), desertification, and water shortages (e.g., Morocco and Tunisia).
- South Asia: Bangladesh and Pakistan experienced severe heatwaves. Pakistan's melting glaciers are affecting rising sea levels and coastal erosion.
- Southeast Asia: Indonesia and Malaysia, situated on the Pacific Ring of Fire, frequently experience earthquakes, tsunamis, and severe flooding.
- Gulf Region: Pervasive flash flooding impacted the UAE, Oman, Iran, Bahrain, and Qatar, highlighting the growing climate vulnerability in the Persian Gulf.

In this sense, climate risk is acknowledged as one of the primary domestic vulnerabilities facing most Islamic countries in the latest assessments by the International Monetary Fund.

Islamic countries in developing economies face challenges similar to those of other nations. According to the Notre Dame Global Adaptation Initiative (ND-GAIN) index, populations in the least-developed economies are exposed to climate disaster risks that are ten times higher than those in advanced economies (ND-GAIN, n.d.). Specifically, many emerging markets and developing economies, particularly in Africa and the Asia Pacific, are vulnerable to the impacts of climate (FSB, 2020). Furthermore, the Climate Risk Index developed by Germanwatch ranks several Islamic countries among the world's most susceptible due to high physical risks and socio-economic vulnerabilities, which could exacerbate the adverse effects of climate risk (Eckstein, Kunzel, & Schafer, 2021). As most Islamic countries are middle to low-income nations that heavily rely on non-renewable natural resources, this situation complicates their adaptability to a lower carbon economy.

In terms of potential economic losses, the Network for Greening the Financial System (NGFS, 2024) forecasts that under current policies, global GDP losses due to climate change could reach 15% by 2050. However, implementing policies to achieve a Net Zero 2050 scenario could significantly reduce the impact to 8-9%, underscoring the necessity of an orderly transition to a low-carbon economy, particularly in ensuring adequate resources to support transition finance.

Islamic Moral Political Economy: Theoretical Conceptualization and Rationalization for Sustainable Development Orientation in Islamic Finance

The pursuit of a fair and sustainable economic system has become increasingly pressing in a world marked by inequality, environmental decline, and social crises, as the modern global economy faces ecological emergencies, widening inequality, and structural instability. Mainstream economics, disconnected from ethical, moral, and spiritual concerns, focuses on efficiency and profit maximisation over justice and sustainability leading to observed social, governance and environmental failures.

Unlike the modernist view, which underpins conventional economics, the Islamic paradigm is rooted in the ontological notion that the universe and Earth were created with a delicate balance (*mizan*), which humans are tasked with maintaining (Asutay, 2019a,b, 2025; Avdukic and Asutay, 2025; Llewellyn, 2024). The word *mizan* signifies the interconnectedness of all elements within a sustainable world, including the economy. Essentially, the universe, Earth, humans, the environment, and animals, as well as the physical realm, are in harmony both internally and through their interactions. This Islamic worldview offers a moral and ontological foundation for an economy and society based on justice (*'adalah*), balance (*mizan*), and unity (*tawhid*), viewing

these not as external factors but as core principles (Asutay, 2007a,b, 2013, 2019a,b; 2025; Llewellyn et al., 2024).

This section, hence, examines the institutional logic of *iqtisad* as the ethical centre of Islamic economics, outlines the Islamic principles that shape economic and social life, and demonstrates how they collectively underpin an Islamic moral political economy and sustainable development.

The Concept of Iqtisad

The Arabic term *iqtisad*, commonly translated as ‘economics’, carries a meaning far broader than the modern understanding. It derives from *qasd* (meaning purpose, moderation, or guiding toward the right path) and *qist* (meaning justice or fair share) (Al-Hasani, 1989; Asutay, 2010a,b; 2025). As a result, *iqtisad* emphasises ‘giving each thing its due’, ‘placing things in their proper context’, and ‘upholding justice’, which inherently involves considering the interests of all parties involved in any transaction- including climate and environmental concerns, alongside human and other stakeholders (Asutay, 2019a,b; 2025).

Unlike conventional economics, which prioritises efficiency and profit maximisation, *iqtisad* emphasises equity, moderation, and balance in all economic activities. It guides human effort toward goals that are both materially and morally meaningful, ensuring that growth does not harm others or the environment (Asutay, 2019a,b; 2025). In this way, *iqtisad* naturally embeds sustainability into its processes and results: resources are to be used responsibly, consumption is to be kept in check, and development should support the flourishing of all stakeholders (Asutay, 2019a,b, 2025; Avdukic & Asutay, 2025; Aassouli and Asutay, 2022).

Furthermore, *iqtisad* signifies emancipation and empowerment. It envisions an economy where access to resources is a right rooted in divine order in the form of privilege from Allah (swt) and not solely dictated by market conditions (Asutay, 2019a,b, 2025; Asutay & Yilmaz, 2025). This concept supports an extended stakeholder-focused development model that acknowledges the interests of humans, the environment, and all other beings created by Allah (swt) (Asutay, 2019a,b, 2025; Avdukic & Asutay, 2025).

The Construct of Islamic Moral Political Economy

Islamic economic thought is structured by foundational axioms that guide behaviour and institutional design. These axioms, derived from Qur’anic ontology, define the nature of human responsibility and the purpose of economic life.

Tawhid emphasises God’s oneness and highlights the interconnectedness and complementarity of all creation, fostering unity. In economic terms, it indicates that all stakeholders are linked within a single system, and decisions should prioritise their collective well-being. No individual, corporation, or government can act independently of the impacts and responsibilities this unity entails (Asutay, 2007a,b, 2012, 2013, 2019a,b, 2025)

Tawhid suggests that the universe is created in a state of balance (*mizan*), which humans are responsible for maintaining (Llewellyn et al., 2024). Economic choices that disturb this balance—like overconsumption, environmental harm, or social exclusion—lead to crises. Therefore, *tawhid* means preserving and sustaining this equilibrium across ecological, social, and economic spheres (Asutay, 2007a,b, 2012, 2013, 2019a,b, 2025)

As a requirement of *tawhid*, *rububiyah* reflects God's nurturing of creation towards perfection. By analogy, economic life must allow every being the opportunity to grow and fulfil its potential. Development should not privilege some at the expense of others but should nourish all stakeholders in their natural paths (Asutay, 2007a,b, 2012, 2013, 2019a,b, 2025).

Building on the ontological principles of *tawhid* and *rububiyah*, *tazkiyah* denotes purification and harmonious development. It entails that growth is pursued in harmony with the needs of other stakeholders. Economic expansion is legitimate only when it respects the rights of humans, animals, the environment, and resources to coexist and flourish (Asutay, 2007a,b, 2012, 2013, 2019a,b, 2025).

Justice or *adalah* is the articulation of the relationships between stakeholders in accordance with the institutional logic described so far. It means recognising the rights of each stakeholder and ensuring equitable access to resources. Justice in Islamic economics is not confined to legal formalities but requires substantive fairness in distribution, opportunity, and outcomes (Asutay, 2007a,b, 2012, 2013, 2019a,b, 2025; Asutay & Avdukic, 2025; Asutay & Yilmaz, 2025).

The Islamic worldview, hence, through the articulations of such axiomatic framework suggests that all creation is entrusted (*amanah*) to humanity, which must manage it responsibly. Resources are not possessions but trusts to be safeguarded and used in ways that respect the rights of others and future generations. Consequently, economic activity carries a moral accountability before Allah (swt), resulting in a stewardship relationship (Asutay, 2007a,b, 2012, 2013, 2019a,b, 2025; Asutay & Avdukic, 2025).

Ihsan, refers to the sustaining of initial equilibrium through benevolence, which adds a corrective dimension. When balance is disrupted, *ihsan* requires restoring equilibrium, often by going beyond strict justice through benevolence and generosity. It embodies the principle that those with greater means must ensure that those without have access to similar opportunities, thereby sustaining social cohesion (Asutay, 2007a,b, 2012, 2013, 2019a,b, 2025).

The Islamic ontological paradigm outlined above is complemented by *maqasid al-shariah*, or the higher goals of Shari'ah, which serve as the methodological basis for applying the principles of Islamic economics (Asutay & Yilmaz, 2018). Traditionally focused on invigoration of faith, life, intellect, wealth, and posterity, *maqasid* are now understood more broadly to include the well-being of all stakeholders (Asutay and Harningtyas, 2015). This encompasses human rights, social solidarity, and ecological conservation (Mergaliyev et al., 2021)

By embedding *maqasid* into economic and financial governance, institutions ensure that their actions reflect balance (*mizan*) and justice (*'adalah*) within the *tawhidi* framework. This approach incorporates intergenerational equity, safeguarding both current and future stakeholders from harm (Asutay, 2007a,b, 2012, 2013, 2019a,b, 2025)..

developed the following definition of Islamic sustainable development to identify its embedded and comprehensive nature to produce sustainable development through the inherent value theory of Islamic moral political economy:

"Recognising the complementary nature of all the stakeholders to reach unity (*tawhid*) within the balance (*mizan*), which requires the recognition and provision of an opportunity space for the development path for each stakeholder to reach their perfection (*rububiyah*), where the growth of each stakeholder has to be in harmony with other stakeholders' (*tazkiyah*), leading to inter- and intra-generational justice (*adalah*) through the equilibrium-based (*ihsani*) governance". (Asutay, 2022; 2019a,b)

The Islamic ontology's defined institutional logic begins with Islamic value theory and advances its own modes of production and distribution theory. Such an institutional logic embedded within *tawhid* paradigm, prioritise the well-being of all stakeholders (Asutay, 2019a,b, 2022, 2025). Islamic value theory regards everything as valuable because of its intrinsic worth or inherent value due to being created by Allah (swt). Therefore, sustainable development is not merely an option but a core behavioural norm rooted in inherited values of Islam which necessitates considering the well-being of all the stakeholders in any transaction (Asutay, 2019a,b,c; 2025).

Ontology-Driven Development Orientation of Islamic Finance

The Islamic ontology-driven approach outlined so far insists and requires that all Islamic financial activity should adhere to the axioms of *tawhid*, *mizan*, and *'adalah*. It mandates positive screening: making sure that financing choices actively support justice, environmental preservation, and social well-being (Asutay & Yilmaz, 2025; Asutay & Avdukic, 2025). This shift changes finance from a profit-maximising tool into a practical science that benefits society and creation (Asutay, 2019a,b; Asutay, 2025).

An Islamic moral political economy based on *iqtisad* and the axioms outlined above suggests a fundamentally different financial system, the main features of which include (Asutay, 2007a,b, 2012, 2013, 2019a,b, 2025; Asutay & Yilmaz, 2025; Asutay & Avdukic, 2025):

- (i) Risk-sharing and mutuality: emphasising partnership-based finance rather than debt-dependence.
- (ii) Redistribution and solidarity: mechanisms such as zakat and waqf to ensure resource accessibility.
- (iii) Embedded financing away from financialization: Financial intermediation must be aligned with the goals of Islamic moral political economy through a human-centred approach that promotes a Society of Solidarity among stakeholders. This entails overcoming financialization and ensuring that Islamic finance remains meaningful only when it supports the aims defined by Islamic moral economy.
- (iv) Extended stakeholder governance: Stakeholder representation must include ecological and social concerns, institutionalised through governance mechanisms.
- (v) Moderation and degrowth: Economic activity must reject over-consumption and excessive financialisation, favouring balance and sustainability.

Islamic moral political economy, therefore, offers an integrated view of sustainability based on divine ontology. Using the concept of *iqtisad* and the guiding principles of *tawhid*, *mizan*, *rububiyah*, *tazkiyah*, *'adalah*, *ihsan*, and *amanah*, it constructs an economy where justice, equity, and harmony are core principles (Asutay, 2019a,b, 2025). This framework challenges the profit-driven focus of conventional economics and redefines finance as a tool to uphold balance, empower stakeholders, and fulfil the moral aims of creation. Thus, by definition, due to such a foundational philosophy, Islamic finance must follow the sustainable development paradigm, which redefines the initial equation through the *iqtisad* institutional logics (Asutay, 2007a,b, 2012, 2013, 2019a,b, 2025) rather than being a moderating factor without changing the original equation, as in the case of SDGs (Asutay, 2019c)

The Emerging Role of Islamic Finance

Despite the Islamic institutional logics identified earlier, since its inception in the 1970s, Islamic finance has often evolved by adapting traditional banking practices to meet Shari'ah

requirements. This strategy successfully avoided prohibited elements like *riba* (interest), *gharar* (excessive uncertainty), and certain unethical industries, primarily through negative screening. However, this approach can result in financial products that are technically compliant but might be socially or environmentally problematic (Asutay, 2007a,b, 2012, 2013, 2019a,b, 2025). The moral goal described above aims to foster Islamic finance that benefits all stakeholders, aligning with the higher objectives or *maqasid al-Shari'ah of Islam* (Asutay & Harningtyas, 2015; Asutay & Yilmaz, 2018; Mergaliyev et al. 2021).

The concept of *Maqasid al-Shari'ah*, or higher objectives of Islamic law, provides a foundational framework for aligning financial practices with societal and environmental aims, thus offering a unique opportunity to operate within the tawhid paradigm by emphasising Islamic value theory (Asutay & Harningtyas, 2015; Asutay & Yilmaz, 2018; Mergaliyev et al. 2021). This holistic approach aims for broader objectives than mere profitability. The key difference between this principle and the conventional idea of ESG lies in the mandatory requirements established by Islamic goals. To promote the adoption of this Islamic environmental stewardship concept, the OIC issued a Fatwa on Environmental Preservation in 2017 to support sustainable finance, encourage proactive measures to reduce carbon emissions, and address climate risks. These efforts aim to maintain environmental equilibrium or restore *mizan* (balance), while increasing accountability and reducing harm.

The Islamic finance industry can boost global efforts to mobilise sustainable finance by adopting a moral approach to its core principles. As a Sharia-compliant financing tool, Green Sukuk has become a crucial instrument for supporting renewable energy, climate adaptation, and sustainable infrastructure. However, several challenges from both demand and supply sides slow its rapid growth, including a shortage of green financing outlets that follow Islamic principles, limited investor capacity due to the pandemic, delays in developing governance standards aligned with international norms and green taxonomies to enable a smooth transition. Despite these issues, the issuance of green Sukuk is likely to increase as the industry aligns its efforts with national climate targets (S&P Global Ratings, 2021). To enhance green finance further, Islamic social instruments—such as *Zakah* and *Waqf*—could be utilised to support climate resilience projects, especially in financing disaster recovery in vulnerable regions.

Despite geopolitical tensions stemming from the United States' efforts under the Trump administration to withdraw from the Paris Agreement, Islamic countries can capitalise on current momentum to boost sustainable finance. They can do this by identifying potential market and industry challenges and achieving important milestones. According to the International Financial Stability Board (IFSB) (2024), several risks threaten the Islamic finance sector, especially due to the underdeveloped Sukuk market. These include: (i) *investment risk*, which arises from dependence on underlying assets for Sukuk (Islamic bonds) and the higher proportion of physical assets in portfolios; (ii) *market risk*, caused by less mature capital markets and elevated financing costs; and (iii) *liquidity risk*, due to limited market liquidity and restrictions in Sukuk secondary market trading.

The ongoing crises across various aspects of life, such as natural disasters and climate risks, should serve as a moral guide for Islamic finance. At this juncture, it is essential to revisit its foundational principles to ensure that, within the *tawhidi* framework, it can offer embedded financial solutions aimed at enhancing the lives of all stakeholders.

Global Green Finance Development and Opportunities for Islamic Finance

The hosting of the Conference of the Parties (COP) 27 (Egypt, 2022) and COP 28 (UAE, 2023) in Islamic countries has accelerated the integration of sustainable finance into the Islamic financial

system. Global efforts to facilitate this transition have been supported by participation from multilateral agencies (e.g., the IsDB, through the development of the Sustainable Finance Framework¹), government agencies, and private corporations. Key milestones in the development of green sukuk market include: (i) the issuance of a practitioners' guide for green Sukuk issuance by the IsDB in collaboration with the International Capital Market Association (ICMA) and the London Stock Exchange Group (LSEG) in March 2024 (IsDB, 2024), (ii) the launch of XTCC as the world's first *Sharia*-compliant exchange-traded carbon credit investment, gained momentum during COP28 (Malenko, 2023). This highlights the opportunities available for the Islamic finance industry to facilitate transition finance while mitigating climate-related risks.

The development of Green Sukuk holds significant potential for financing renewable energy and other environmental assets in Islamic countries, aligning with global sustainable finance initiatives aimed at combating climate risks. This distinctive instrument meets *Sharia* compliance requirements while promoting environmental preservation, social equity, and the responsible management of natural resources, making it an ideal option for new Islamic finance instruments focused on addressing climate risk. Numerous recent studies advocate for the use of Green Sukuk as a means to advance sustainable agendas and circular economies across various regions, all while ensuring competitive profitability (Campisy et al., 2018; Al-Roubaie and Sarea, 2019; Khan, 2019; Hariyani & Kusuma, 2020; Ibrahim & Shirazi, 2020; Aassouli et al., 2018; and Abdullahi, 2020 as cited in Rusydiana et al., 2022). The IFSB (2024) has noted a rising trend in Sustainable Sukuk issuances over the past few years, with total issuances in 2023 amounting to USD 11.94 billion; approximately 65% or USD 7.75 billion were Green Sukuk, particularly from East Asia, the Pacific, and the GCC region. This type of Sukuk supported the clean transportation sector, energy efficiency, climate adaptation, and renewable energy projects, all contributing to economic growth and job creation, enhancing public health and connectivity, as well as bolstering climate change resilience in line with the SDG objectives. The market remains poised for significant growth, especially in light of the increasing demand for ethical and socially responsible investment, coinciding with the anticipated continued growth of Islamic finance assets projected to reach USD 6.7 trillion by 2027 (ICD & LSEG, 2023). Furthermore, the London Stock Exchange reported that a total of USD 9.9 billion of Green Sukuk was issued in the first half of 2024, and with this growth and an estimated 5% allocation of Islamic finance assets toward sustainable investment, climate finance in 2030 is forecasted to reach USD 400 billion (Greenpeace MENA & Ummah for Earth, 2024).

Another potential opportunity within the Islamic financial context lies in Islamic social instruments. Few studies have explored the contribution of Zakah to the green economy, recommending the use of Islamic social instruments to address post-harvesting losses in Bangladesh, cash waqf to support afforestation programmes (Hamid et al., 2019; Julia et al., 2020; and Abdullahi, 2020 as cited in Rusydiana et al., 2022), and waqf for the circular economy (Khan, 2019 as cited in Hermala et al., 2024). Exploring the potential role and effective implementation of *Zakah* and *Waqf* towards sustainable objectives can enhance the utilisation of these instruments, particularly in meeting the substantial demand for transition finance in Islamic countries and supporting recovery from severe natural disasters. Additionally, the discussion on how technological innovation, paired with appropriate regulations, could serve as a game-changer in achieving both sustainability and financial inclusion objectives.

¹ IsDB. (2019). Sustainable Finance Framework.

Way Forward: Developing a Strategic Roadmap for OIC Countries

Building on the recent progress, developing a strategic roadmap for OIC Countries is timely and essential to sustain momentum in achieving the Paris Agreement's 2030 milestone. This roadmap acknowledges that the successful mobilisation of green finance requires collaboration among a broad range of stakeholders, including policymakers, private sectors, and international organisations. Given their critical role in shaping regulatory frameworks and fostering an enabling environment, policymakers must take proactive measures to drive industry efforts to address climate risk (CIBAFI, 2024). The framework can leverage existing global initiatives such as the G20 Roadmap, which promotes market development for sustainable investments and transparency, alongside the 2023 Roadmap for Islamic Sustainable Finance, jointly developed by IFSB, CIBAFI, and AAOIFI. This alignment will be particularly crucial in enhancing data availability and transparency while fostering market development initiatives. The roadmap will be structured in accordance with best practice implementation, ensuring a systematic and integrated approach tailored to the diverse climate challenges and progress levels among OIC members, thereby supporting an actionable guide for accelerating the adoption of Islamic green finance and strengthening climate resilience in Islamic countries.

In alignment with the earlier background discussion and in accordance with the COMCEC Terms of Reference, the study aims to:

- (i) Examine the development and practices of Islamic green finance instruments aimed at addressing climate change and natural disasters.
- (ii) Examine global trends in Islamic sustainable finance and compare them to the performance of conventional markets.
- (iii) Evaluate the best practices, current initiatives, risks, and challenges in both OIC Member Countries and non-OIC countries.
- (iv) Identify the key stakeholders and their roles in promoting collaboration for green finance advancement.
- (v) Offer policy recommendations to bolster the growth of the Islamic green finance market
- (vi) Develop a structured roadmap to accelerate sustainable finance adoption in OIC Member Countries.

This study will provide a comprehensive foundation for policymakers in Islamic countries, providing practical strategies for harnessing Islamic finance for sustainable development and climate resilience.

Research Methodology

To achieve the identified aims and objectives, the study will employ a systematic and multifaceted approach, combining qualitative and quantitative analysis to ensure a comprehensive assessment of Islamic sustainable finance and its role in mitigating climate risk.

The study will first develop a critical review of the existing body of knowledge, as outlined in the conceptual framework chapter. The documents regarding Islamic sustainable finance instruments, global Sukuk market development, the Islamic green finance project development, risks and challenges, and the role of international bodies and stakeholders in supporting Islamic sustainable finance markets will be reviewed. This includes research on the potential role of Islamic social instruments in sustainable finance, as well as benchmarking against global sustainable finance practices. The review will draw on a wide range of secondary sources,

including global policy reports, industry analyses, and academic research, with particular emphasis on institutional frameworks, instrument development, country-level policies, and regulatory frameworks.

The study will employ a case study approach to explore a leading-by-example implementation of Islamic sustainable finance across various economic and regulatory environments. The selection of countries will be based on factors such as climate risk vulnerability, Islamic finance development level, initiatives in green finance, policy frameworks, and the potential for scalability and best-practice learning. This case study methodology will be bolstered by an analysis of secondary sources, including reports and policy documents, while primary data will be gathered from key individuals in the relevant case countries through interviews to foster a comprehensive understanding of the subject matter. Additionally, to further evaluate perspectives and preferences concerning Islamic green finance instruments, a questionnaire survey will be distributed to pertinent stakeholders, including a selection of policymakers, Islamic financial institutions, industry practitioners, multilateral organisations, and sustainability experts. This will facilitate the identification of key challenges and potential solutions for Islamic sustainable finance practices, assess market demand, and evaluate stakeholder preferences, alongside potential enhancements to policy and regulatory frameworks.

Field visits will take place in four of the case countries (Indonesia, Qatar, Nigeria and Azerbaijan), while one of the case countries (the UK) will be studied by country-level researchers through desk-based research and benchmark practices. These field visits are scheduled to occur between April-June 2025, taking into account the timing of the Eid holidays.

To summarise, the proposed research will predominantly utilise two methodologies: primary data collection and analysis, and analysis based on secondary data. The gathered data will be analysed through descriptive, analytical, and interpretive methods, ensuring a structured synthesis of qualitative and quantitative insights. Drawing from the research findings, the study will develop evidence-based policy recommendations aimed at strengthening enabling environments for Islamic green finance, enhancing policy coordination between OIC Member Countries and international bodies, promoting innovation, and addressing capacity-building needs for policymakers. The recommendations will be proactive, incorporating emerging best practices and scalable solutions. Furthermore, the study will outline a strategic roadmap to expedite the adoption of Islamic green finance within OIC Member Countries.

In Table 1 below, the sample countries are presented, along with their climate risk vulnerabilities.

TABLE 1: SELECTED COUNTRIES FOR CASE STUDY

Country	Group	Desk/ Field Visit	IF Dev. Level	Income Group	2023 ND- GAIN Index* ²	Vulnerability Sub-Index* ³	Readiness Sub- Index** ⁴
Azerbaijan	Asian	Field	Low	Upper middle	86 (Moderate)	80 (Moderate)	100 (Moderate)
Indonesia	Asian	Field	Moderate	Lower middle	98 (Moderate)	97 (Moderate)	106 (Moderate)
Nigeria	African	Field	Moderate	Low	157 (Severe)	126 (Moderate)	173 (Not Ready)
Qatar	Arab	Field	Developed	Upper	37 (Strong- Moderate)	34 (Mild- Moderate)	48 (Ready- Moderate)
United Kingdom	Non- OIC	Desk	Moderate	Upper	8 (Strong)	6 (Very mild)	13 (Ready)

Note: *out of 187 countries, ** out of 192 countries; IF: Islamic Finance

Source: <https://gain.nd.edu/our-work/country-index/rankings/>; Country group classifications in the ToR document is used.

The rationale for the selection of the country cases is provided as follows:

Indonesia

Indonesia is the most populous Muslim-majority nation in the world and is recognised as the largest Muslim economy, as well as a member of the Group of Twenty (G20). However, it ranks among the most vulnerable OIC countries (top 14) according to the Climate Risk Index, due to its high physical risk and socio-economic vulnerabilities. Over the past three decades, it has encountered approximately 300 natural disasters, including 200 flooding events, impacting more than 11 million people (World Bank, 2023). Indonesia holds the position of the fifth-largest carbon emitter globally, significantly attributed to its coal-based power system and land use (World Bank, 2024) – following China, the United States, Russia, and India (IMF & World Bank, 2024). In 2020, it was the world’s largest coal exporter and the seventh-largest LNG exporter (US Energy Information Administration, 2021). Additionally, the domestic banking sector is highly exposed to carbon-intensive industries and could potentially transmit losses through credit and market risk channels (IMF & World Bank, 2024).

According to the IMF’s latest assessment, Indonesia faces both transition and physical risks, which have a medium likelihood and expected impacts, except for the effects of extreme climate events (IMF, 2024), considered low due to the limited impacts arising from the country’s diverse geographical landscape and archipelagic nature. In its Nationally Determined Contributions (NDCs), Indonesia has pledged to reduce carbon emissions unconditionally by 31.89%, with a conditional target of 43.20% through additional measures by 2030 (Republic of Indonesia, 2024), while aiming for a net-zero target by 2060. The World Bank (2024) estimates that climate mitigation finance needs will reach USD 267-311 billion by 2040, highlighting the necessity for private sector involvement to support public financing. Several initiatives, such as the

² The ND-GAIN Index (2025) captures the countries vulnerabilities and readiness to improve climate resilience, the detail ranking (2022 as the latest) can be found in: <https://gain.nd.edu/our-work/country-index/rankings/>

³ The ND-GAIN Vulnerability score presents a countries risks based on exposures, sensitivity and ability to address the climate risks particularly from six key sectors: food, water, health, ecosystem service, human habitat and infrastructure.

⁴ The ND-GAIN Readiness score reflects the country’s capacity to leverage investment and utilize it for concrete climate actions, based on three essential factors: economic, governance and social readiness.

Indonesian Just Energy Transition Partnership (JETP) and the Energy Transition Mechanism country platform, have been introduced to garner broader support from international and public participants (World Bank, 2024).

To enhance the enabling environment, the Indonesian Government and authorities have strengthened legal and regulatory reforms, including the enactment of the Financial Sector Omnibus Law Number 4 of 2023, which mandates the establishment of a Sustainable Finance Committee to support policy coordination and optimise the relevant mandates of the authorities, develop data, and set up a sustainable taxonomy. This Committee includes the Ministry of Finance, the Indonesian Financial Sector Authority (OJK), and the Central Bank. Following the enactment of the Law, financial sector authorities have progressively aligned their efforts to support national targets, such as through micro and macroprudential requirements and carbon taxonomy. Key milestones include the issuance of OJK regulation in 2017, which requires financial institutions to adopt sustainable practices, the OJK sustainable finance roadmaps, and the 2017 Sustainable Finance Umbrella Policy outlining action plans for the financial industry, as well as the green finance taxonomy to support the development of financial instruments, including green Sukuk.

Indonesia stands as a leader in sustainable finance, being the largest issuer of green sukuk and the first to issue sovereign green sukuk in 2018, raising USD 1.25 billion as an innovative solution from the Islamic finance industry. By 2021, it had raised USD 3.9 billion in sovereign and retail green sukuk, primarily allocated to the energy sector (World Bank, 2023). The green sukuk market continues to experience steady growth, particularly for financing green projects, including sustainable transportation, flood mitigation, renewable energy, green buildings, water, and waste management (Greenpeace MENA & Ummah for Earth, 2024). An important milestone was also achieved with the highest issuance of USD 1.5 billion in global green sukuk in 2022. From 2017 to Q3 2024, Indonesia emerged as the frontrunner in cumulative issuance, totalling USD 7.83 billion, surpassing the Islamic Development Bank and the Malaysian Government, which issued USD 5.07 billion and USD 3.06 billion, respectively (Greenpeace MENA & Ummah for Earth, 2024). This underscores the country's commitment to addressing climate risk through innovative Islamic finance instruments from fiscal policy perspectives, complementing the efforts of financial sector authorities. These collaborative efforts and significant achievements may provide a valuable benchmark for the development of policy recommendations, especially for a country susceptible to physical and transition risks.

Nigeria

Nigeria has implemented several climate risk initiatives to tackle the challenges posed by climate change. Notable initiatives include the establishment of the National Council on Climate Change (NCCC) in 2022 to formulate policies aimed at achieving a green and sustainable economy in Nigeria. The National Agency for the Great Green Wall (NAGGW) was also established to combat land degradation and desertification in northern Nigeria. It aims to restore ecosystems, enhance food security, and support communities in adapting to climate change.

The NAGGW serves as Nigeria's focal point for the African Union's Great Green Wall project. The Agro-Climatic Resilience in Semi-Arid Landscapes (ACReSAL) is a six-year initiative funded by the World Bank aimed at restoring degraded landscapes in Northern Nigeria. This project emphasises sustainable landscape management practices, ecosystem restoration, and enhancing agricultural productivity to improve climate resilience. The Climate Action Africa (CAA), founded A non-governmental organisation was established in July 2021 to address

climate issues in Africa. It collaborates with various stakeholders to enhance strategies for sustainable environmental practices, including organising learning spaces for children to raise awareness about climate change. Thrive Agric's Sustainable Agriculture Programme is a pilot initiative launched in November 2024 to promote sustainable agriculture. The initiative involves planting fruiting trees alongside traditional crops, allowing farmers to earn carbon credits. This will mitigate climate change and enhance agricultural productivity.

Islamic finance is ideally suited for climate change initiatives, offering a distinctive framework for tackling climate issues through ethical, risk-sharing, and sustainable financial solutions. Nigeria can utilise Islamic finance instruments such as Green Sukuk, Islamic microfinance, Waqf, and Takaful to mobilise resources for climate action. So far, Nigeria has issued six sovereign Sukuk for road and erosion control projects.

Qatar

The multidimensional Qatar National Vision 2030 (QNV 2030) is founded on a comprehensive approach to human development, encompassing four societal pillars: economy, people, culture, and environment. The country's environmental and climatic characteristics—extremely hot climate, low rainfall, and lack of freshwater resources—make it challenging.

Achieving the four pillars of QNV 2030 requires a shift from a resource-intensive economy to a sustainable model that encourages economic diversification away from hydrocarbons while promoting environmental responsibility and social impact. In this context, the State has implemented several measures to combat climate change. These include increasing the use of solar energy to over 20% of its energy mix by 2030, optimising water usage, improving air quality, enhancing waste recycling, and expanding green spaces, alongside the country's commitment to hosting the first 'carbon-neutral' tournament featuring solar-powered stadiums and water- and energy-saving cooling and lighting technology. The State is also a signatory to the Paris Agreement on climate change and supports numerous global initiatives related to climate change mitigation.

In September 2020, Qatar National Bank (QNB) issued Qatar's first-ever green bond, a tranche of US\$600 million, under its medium-term note programme. The bond matures in five years and is in accordance with the bank's established Green, Social, and Sustainability Bond Framework. Furthermore, the Qatar Financial Centre Authority launched a sustainable bond and Sukuk framework in March 2022 to facilitate the issuance of sustainable bonds and Sukuk in Qatar.

Similarly, Masraf Al Rayan introduced its sustainable financing framework in April 2022 to further its ESG agenda. While Sukuk and bond issuance in Qatar are primarily driven by government activity and commercial banks for corporate issuances, the development of green Sukuk in Qatar, bolstered by a supportive ecosystem, could facilitate corporate green and sustainable Sukuk issuance, thereby enhancing market liquidity and increasing the mobilisation of sustainable finance.

Azerbaijan

Azerbaijan's economy exhibits a significant reliance on hydrocarbon resources, which constituted approximately 47.8% of the country's GDP and over 92.5% of its export revenues in 2022, according to the International Trade Administration (ITA, 2023). This heavy dependence on oil and gas not only underscores the country's economic vulnerabilities but also highlights the need for diversification, especially in light of global shifts towards sustainable energy sources.

In terms of environmental impact, Azerbaijan accounts for approximately 0.15% of total global GHG emissions, with the energy and agriculture sectors being the primary contributors. The energy sector significantly contributes to GHG emissions due to its dependence on fossil fuels. Meanwhile, traditional agricultural practices do not always align with sustainable methods, and the sector is vulnerable to natural disasters, including floods. To address these issues, the government has implemented several measures aimed at reducing emissions from land use, forestry, waste, and industrial processes. Additionally, Azerbaijan has developed partnerships with international organizations to support these efforts. For example, USAID has collaborated with the Government of Azerbaijan to enhance climate resilience through initiatives focused on climate-smart agriculture and energy reform (USAID, 2024).

Azerbaijan was the host for COP29, which has intensified its climate commitments, aligning with global efforts to mitigate climate risks. The country initially pledged to reduce GHG emissions by 35% by 2030 under its NDC but has updated its commitments to a 40% reduction by 2050. By 2022, Azerbaijan (2025) had reduced total emissions by 16-18% compared to 1990 levels, primarily driven by a 25% decrease in energy sector emissions. Despite contributing only 0.11% of global emissions, Azerbaijan is amongst the nations most impacted by climate change (UNDP, n.d.). To address this, the green economy is a national priority under “Azerbaijan 2030: National Priorities for Socio-economic Development” toward accomplishment of the Paris Agreement (Azerbaijan, 2025). The framework is implemented by the action plan of the 2022-2026 Socio-economic Development Strategy, which integrates green technologies, a national emissions database, adaptation planning, and energy efficiency measures. In addition, the country will enact the Law “on the Management of Greenhouse Gases Released into the Atmosphere” to establish a carbon trading mechanism.

Azerbaijan remains highly dependent on oil and gas, a common challenge for emerging economies. However, advancements in technology have slightly reduced its carbon footprint. The country aims to increase renewable power capacity to 30% by 2030 and to become a green energy leader (COP29, n.d.), particularly by integrating solar and wind power plants into its energy system.

Financial support is crucial to attain the country’s climate objectives despite the challenges faced in mobilizing private funds. However, their COP29 leadership has catalyzed a shift in the climate finance landscape, both domestically and globally. The banking sector, comprising 95% of the financial sector’s assets (OECD et al., 2018), has resolved to finance \$1.2 billion of green projects by 2030 through international collaboration, public-private partnership, and green bond issuances, following the Green Taxonomy establishment by the central bank in November 2024 (Interfax, 2024; CBAR, 2024). Under Azerbaijan’s COP29 Presidency, the Baku Finance Goal was launched, setting a \$1.3 trillion target for developing countries by 2035, with a new \$300 billion core finance goal from the previous target of \$100 billion (COP29, 2024). This resolution has further set a global climate finance architecture to support developing economies and unlock global investment opportunities. In addition, COP29 agreed on a global green taxonomy roadmap to mobilise global climate finance (Costa, 2024). To unlock the full potential of the Islamic finance industry, continued discussions on the mobilisation of global Islamic climate finance also transpired during the Baku COP, following the previous two COP meetings held in Islamic countries. The discussion highlighted the importance of Green Sukuk as an alternative investment instrument and establishment of taxonomies toward global climate actions (IsDB, 2024).

Recognizing the urgency of climate change, Azerbaijan has made considerable initiatives in addressing its adverse effects by formulating and adopting various climate-related policy

documents. The successful hosting of the 29th Conference of the Parties (COP29) in Baku in 2024 is a testament to the country's commitment to global climate efforts and showcases its role as a proactive participant in international climate discussions (COP29-Baku, 2024).

While Islamic finance currently constitutes a relatively minor segment of Azerbaijan's financial system, it holds substantial potential for growth. This potential is particularly notable when considering the demographic context, with a significant proportion of the population identifying as Muslim. Furthermore, Azerbaijan maintains strong economic and cultural ties with Türkiye and several Gulf countries, both of which have established Islamic finance frameworks. Additionally, Azerbaijan occupies a strategic position among Turkic and Central Asian nations, suggesting considerable opportunities for collaboration and knowledge-sharing in this realm.

Despite this promising backdrop, the potential of Islamic finance has not yet been fully harnessed in the context of climate change initiatives. Developing Islamic financing mechanisms could provide essential funding for renewable energy projects, sustainable agricultural practices, and other environmentally friendly endeavours. This potential is also emphasised by professionals with experience in the region (ReportAZ, 2024). Establishing a comprehensive framework that integrates Islamic finance with climate action strategies would not only benefit Azerbaijan but could also serve as a model for other member countries of the OIC. These countries, many of which have limited Islamic financial infrastructure alongside emerging climate change strategies, could draw invaluable insights and recommendations from Azerbaijan's experience, promoting a more robust and collaborative approach to mitigating climate impacts across the OIC region.

United Kingdom (UK)

The UK is a global climate finance and actions leader. Initially committing to a 68% emissions cut by 2030, the UK raised its target to 81% by 2035 at COP29 (UK, 2024); IMF, 2024). From 1990 to 2022, the country cut its carbon emissions by 50%, driven by coal phase-outs—marking it as the first G7 country to eliminate coal-fired power (IMF, 2024; DESNZ & MP, 2024). The UK maintains a net-zero goal by 2050, underpinned by strong policies and climate finance commitments.

The UK (2024) was the first nation to establish government climate initiatives and national emission targets under the 2008 Climate Change Act, mandating the establishment of an independent Climate Change Committee (CCC) to assess adaptation progress, advise the government, and oversee the Climate Change Risk Assessment (CCRA) and National Adaptation Programme (NAP). Climate adaptation is devolved across the UK's four nations, with His Majesty's Government (HMG) integrating adaptation into national policies such as energy security and foreign affairs. The 2030 Strategic Framework for International Climate and Nature Action further shapes the UK's global climate role (HMG, 2023a).

The UK leads in International Climate Finance (ICF), having committed £5.98 billion (2016-2021) and an additional £11.6 billion (2021-2026) to support developing countries' low-carbon transitions. Under its COP26 presidency, the UK spearheaded a climate finance delivery plan, mobilizing \$115.9 billion in 2022 (UK, 2024).

The UK was the first country to publish the Green Finance Strategy in 2019 and updated it in 2023, which promotes green investment, strengthens climate resiliency in the financial system, and aligns global financial flows (HMG, 2023b). The Strategy lays the framework for the establishment of enabling ecosystems, including taxonomy, ESG data, financial advice, and

literacy. Furthermore, the London Stock Exchange pioneered issuing green bonds, with the issuance of £120 billion and a public carbon market framework.

Despite its progress, UK emissions remain around 1% of the global total, down from 2.5% in 1990 (IMF, 2024). However, climate risks persist, including extreme weather (e.g., severe floods) and policy shifts from global carbon prices (IMF, 2022). Weakened 2023 policies—such as delayed gas grid phase-outs—raised concerns about meeting 2030 targets, highlighting the need for sustained regulatory vigilance (IMF, 2024). The UK financial authorities have led global efforts in integrating climate risk considerations in financial assessment and policies, as well as mandatory disclosure requirements aligned with global initiatives.

It should also be noted that the UK is an essential centre for the Islamic finance industry, being the main hub in the Western hemisphere, which houses five Islamic banks, and some of its conventional commercial banks offer Islamic mortgages and accounts through Islamic windows. The industry has developed since the mid-1990s with the tax and legal facilitation provided by the government for a ‘level playing field’. The UK is also one of the non-Muslim majority countries issuing sovereign *sukuk*, and it is the legal home for many Islamic finance industry disputes. It is also an efficient platform for *sukuk* issuance and is home to one of the strongest Islamic fintech emergences in the world. Hence, the UK has critical potential offerings for climate finance through Islamic finance as it has a proven successful climate and sustainable development finance record.

Overview of the Study

The remainder of this study is structured as follows.

Chapter 1 discusses offers an in-depth discussion of green finance, its importance, and its increasing role in addressing climate risk and challenges related to natural disasters. It starts by introducing the fundamental concepts of green finance and its alignment with the SDGs, stressing its contribution to environmentally sustainable economic growth. The chapter examines global trends in green finance, emphasizing its growth across various sectors and the rising commitment from financial markets and policymakers. It also presents various funding models for green projects, categorizing them by recipient sectors and financial mechanisms. Major challenges faced in implementing green finance projects globally, including regulatory, financial, and operational barriers, are addressed. Additionally, the chapter reviews the roles of key stakeholders, such as multilateral organizations, development banks, and private sector actors, and considers potential areas for collaboration. Finally, the chapter draws insights from successful global practices and investigates how these lessons can be applied within the Islamic finance industry to enhance green financing through Shariah-compliant mechanisms.

Chapter 2 provides a comprehensive examination of the role of Islamic finance in addressing climate risks and supporting preparedness for natural disasters. It begins by introducing the theoretical foundations of Islamic finance principles and their relevance in mitigating climate-related financial risks. The chapter highlights the progress made across various sectors in the OIC Member Countries. Additionally, it identifies key sectors where green finance projects have demonstrated significant impact and growth. The discussion also touches upon the performance measurement of Islamic green finance instruments compared to their conventional counterparts, assessing their effectiveness in fostering sustainability. Furthermore, the chapter outlines the main challenges faced by OIC Member Countries in implementing green finance, including regulatory, financial, and institutional barriers. The roles of multilateral organizations, industry stakeholders, and other key players in supporting green finance initiatives are briefly

introduced as well. Lastly, the chapter explores the potential use of Islamic social finance instruments in promoting green finance.

Case countries, namely Indonesia, Nigeria, Azerbaijan, Qatar, and the UK (a non-OIC member), will be examined through secondary sources such as reports and policy documents, and primary data were obtained from the key people in the relevant case countries through interviews to develop a comprehensive understanding on the subject matter in the previous chapters. These countries were chosen based on their progress and efforts in sustainable finance, climate risks, and vulnerabilities, as well as the availability of Islamic financial instruments for green projects. The analysis in Chapter 3 also presents the results from the descriptive study of the survey-based data, which provides additional insights by the larger stakeholders in quantitative and qualitative meaning.

Chapter 4 outlines concrete policy recommendations and a roadmap for Islamic green financing alternatives, focusing specifically on climate risk mitigation and natural disaster preparedness. The recommendations are structured as a roadmap to assist OIC Member Countries in their pursuit of a climate-resilient economy. Each recommendation is precise, applicable, and results-oriented. Additionally, the chapter explains the rationale behind each recommendation to enhance best management practices among all OIC Member Countries, facilitating knowledge transfer and promoting the role of Islamic finance.

The roadmap is presented in detail with a step-by-step approach to guiding the Member Countries to benefit more from Islamic green finance models. The OIC Member Countries have different approaches and implications for Islamic finance. As a result, these differences are considered while proposing policy recommendations and a roadmap for the OIC Member Countries. The policy recommendations are developed in terms of short-term and long-term recommendations. Short-term recommendations are heavily based on the results, while long-term recommendations are structural in form and reflect the findings.

The last chapter concludes the report.

CHAPTER 1: GREEN FINANCE INITIATIVES: GLOBAL PERSPECTIVE

This chapter offers an in-depth discussion of green finance, its importance, and its increasing role in addressing climate risk and challenges related to natural disasters. It starts by introducing the fundamental concepts of green finance and its alignment with the SDGs, stressing its contribution to environmentally sustainable economic growth. The chapter examines global trends in green finance, emphasizing its growth across various sectors and the rising commitment from financial markets and policymakers. It also categorises various funding models for green projects by recipient sectors and financial mechanisms. Major challenges faced in implementing green finance projects globally, including regulatory, financial, and operational barriers, are addressed. Additionally, the chapter reviews the roles of key stakeholders, such as multilateral organizations, development banks, and private sector actors, and considers potential areas for collaboration. Finally, the chapter draws insights from successful global practices and investigates how these lessons can be applied within the Islamic finance industry to enhance green financing through Shariah-compliant mechanisms.

1.1. Climate Change and Natural Disaster Risk: Global Context and Theoretical Framework

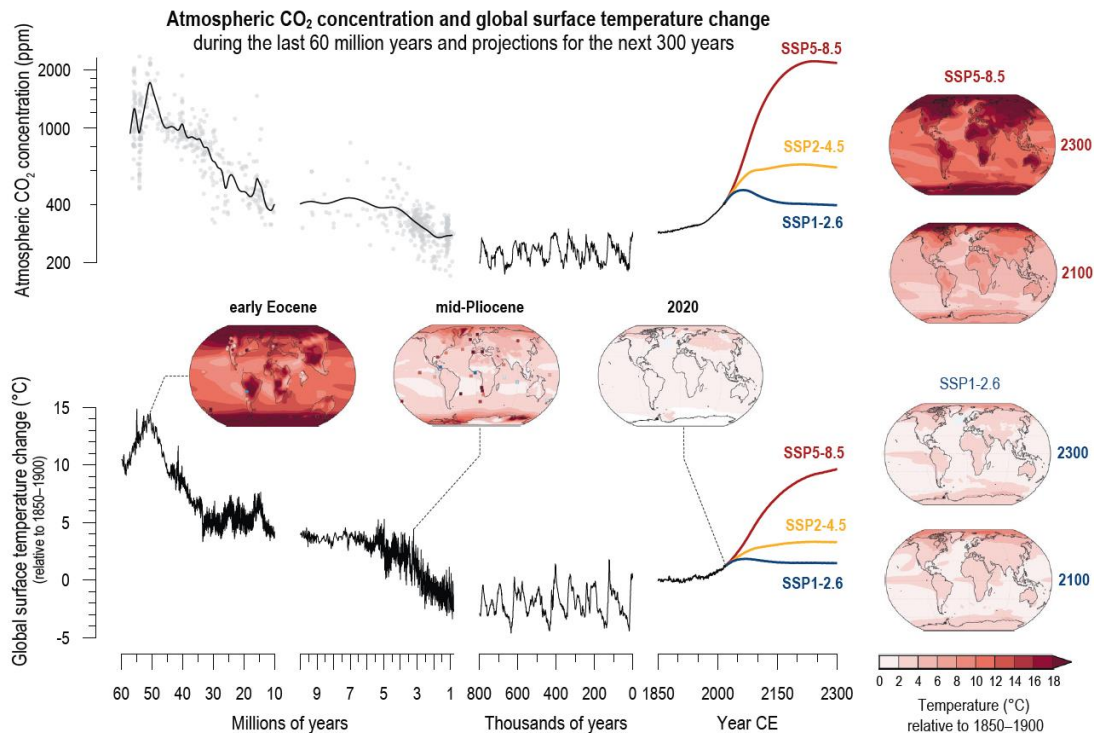
Natural disaster risks arise from both long-standing geophysical processes and accelerated anthropogenic climate change. Geophysical hazards such as earthquakes and volcanic eruptions have shaped Earth's landscape for millions of years. However, in recent decades, the intensity, frequency, and systemic impact of disasters have increased due to climate related drivers such as rising global temperatures, erratic rainfall patterns, and sea level rise amplified the physical exposure of populations and infrastructure.

Climate Change

Climate change theory is strongly supported by insights from paleoclimate records, which offer a long-term view of Earth's natural climate variability. Proxy data from sources such as ice cores, marine sediments, and tree rings reveal substantial historical fluctuations in global temperatures and greenhouse gas (GHG) concentrations. These changes were primarily driven by natural forcings, including volcanic eruptions, solar radiation variations, and orbital cycles. Within this context, the close relationship between atmospheric carbon dioxide (CO₂) levels and global temperatures is a well-established feature in paleoclimate evidence (IPCC, 2021a).

However, recent trends in global warming exhibit anomalies in both their speed and scale. The IPCC Sixth Assessment Report (AR6) notes that global surface temperatures have risen more rapidly in the past few decades than during any other period over the past 2,000 years. In addition, current atmospheric CO₂ levels have surpassed any concentrations observed in the last 2 million years, with rates of increase faster than any natural change recorded in Earth's geological history (IPCC, 2021a; IPCC, 2021b).

Figure 1: Atmospheric CO₂ Concentration And Global Surface Temperature Change Over The Last 60 Million Years And Projections For The Next 300 Years



Notes: The top panel shows reconstructed atmospheric CO₂ concentrations, and the bottom panel depicts global surface temperature anomalies relative to 1850–1900. Paleoclimate epochs (e.g., early Eocene, mid-Pliocene) show natural variability in climate driven by long-term geophysical and orbital factors.

Attribution studies confirm that this unprecedented warming is primarily caused by human activities, particularly the combustion of fossil fuels, deforestation, and land-use changes (WMO,2023;WWA, 2024). Climate models show that the observed warming patterns cannot be reproduced using only natural factors. It is only when anthropogenic GHG emissions are included that simulations accurately match observed temperature trends, leading the IPCC to conclude with very high confidence that human influence is the dominant cause of global warming since the mid-20th century (IPCC, 2021b).

Relationship between atmospheric CO₂ concentrations and global surface temperature change from deep-time paleoclimate records through to 2300 CE model projections shown in **Figure 1**. The projection from present to 2300 were modelled under three Shared Socioeconomic Pathways (SSPs) paired with Representative Concentration Pathways (RCPs) Scenarios – SSP1-2.6, SSP2-4.5, SSP5-8.5 (Summary of the SSPs scenario can be seen in **Table 2**). The figure shows how socioeconomic choices drive long-term climate outcomes. The projected impacts of climate change will vary significantly across countries, depending not only on their geographic and socioeconomic characteristics but also on the global and national development pathways they follow.

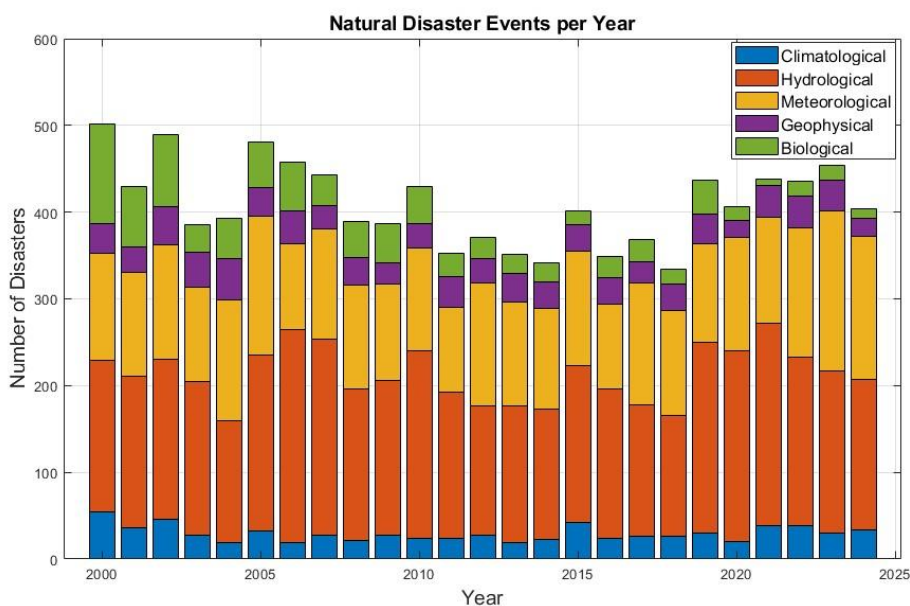
TABLE 2: SHARED SOCIOECONOMIC PATHWAYS (SSPs)

Scenario	Summary
SSP1 : Sustainability	Low challenges to mitigation and adaptation; green growth and equity-focused development.
SSP2 : Middle of the Road	Current trends continue; moderate socio-economic progress with some environmental concern.
SSP3 : Regional Rivalry	High challenges to both mitigation and adaptation; fragmented world, slow technological development.
SSP4 : Inequality	High inequality within and across countries; uneven capacity to adapt.
SSP5 : Fossil-fueled Development	High challenges to mitigation; rapid economic growth relying on fossil energy.

Natural Disaster: Climate-Induced and Geophysical-Induced Risks

Natural disasters can be broadly classified into climate-induced and geophysical-induced events. Climate-induced disasters, including floods, droughts, heatwaves, cyclones, and wildfires, are increasingly linked to global warming (IPCC, 2021a). The rising global temperatures and altered precipitation patterns are intensifying weather extremes across the globe. Emergency Event Databased (EM-DAT) in Figure 2. shows that hydro-meteorological events have accounted for nearly 90% of all recorded disasters globally between 2000 and 2024 (EM-DAT, 2025).

In contrast, geophysical disasters such as earthquakes, volcanic eruptions, and tsunamis are not directly influenced by climate change. However, their impacts can be compounded by climate induced condition, such as when earthquakes damage flood defenses during monsoon periods. Events like Indonesia Indian Ocean tsunami in 2004 demonstrate the devastating power of such geophysical events (UNESCO-IOC, 2020).

Figure 2: Annual Frequency of Natural Disaster Events by Hazard Type (2000–2024)

Source : EM-DAT (accessed 2025)

Compound risks occur when multiple climate-related or geophysical hazards interact, resulting in amplified impacts on society, ecosystems, and infrastructure. These include phenomena such as heatwaves coupled with droughts, storm surges combined with heavy rainfall, or wildfire-prone conditions driven by simultaneous heat, low humidity, and strong winds (IPCC, 2021a). When these hazards coincide spatially or temporally, they often exceed the design thresholds of protective infrastructure and disaster response systems.

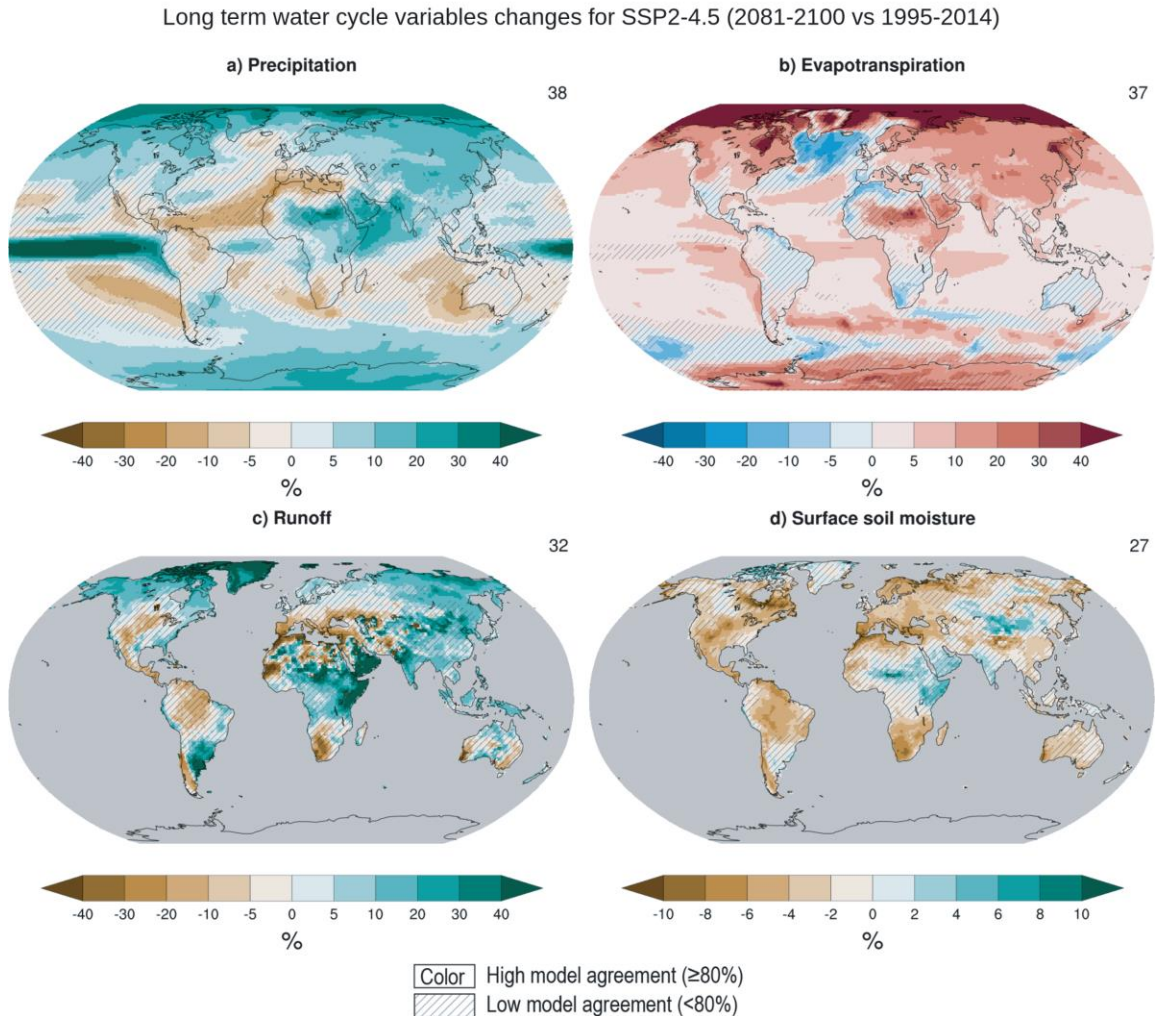
Cascading risks emerge when an initial event triggers secondary hazards, as seen in instances where earthquakes precipitate landslides or infrastructure failures (UNDRR, 2022). Meanwhile, systemic risks affect interconnected sectors such as energy, agriculture, and transport, leading to widespread disruptions (OECD, 2020). The IPCC Sixth Assessment Report (AR6) emphasizes that climate change is intensifying the frequency and severity of compound and cascading risks, while also heightening exposure to geophysical threats (IPCC, 2021a). These multi-hazard interactions underscore the need for integrated risk assessment and cross-sectoral resilience planning.

Under the SSP2-4.5 scenario, projections reveal regionally varied shifts in the global hydrological cycle (see Figure 3.). While precipitation and runoff are expected to increase in high-latitude and tropical regions, mid-latitude and subtropical zones including Southeast Asia, may experience sharp declines in soil moisture and runoff (IPCC, 2021a). These changes will have major implications for water security and climate resilience planning.

Regions facing increased precipitation may encounter heightened flood and landslide risks, particularly where infrastructure and land use management are insufficient. Conversely, areas with declining soil moisture are likely to experience more frequent droughts, threatening crop yields and water availability, and increasing wildfire risk. High uncertainty in regional projections further underscores the need for adaptive, context-specific disaster risk reduction strategies.

The rise in climate related hazard, such as floods, droughts, cyclones, and wildfires, has become evident globally, with major social, economic, and environmental consequences. For instance, the 2022 Pakistan floods displaced over 33 million people, while recurring wildfires in Australia and California have caused widespread destruction. Although these events impact both developed and developing nations, the burden is often heavier in low-income countries due to limited adaptive capacity and infrastructure (World Bank, 2022). These patterns reveal structural vulnerabilities across sectors such as health, housing, and social protection, and reinforce the urgent need for integrated, well-resourced climate risk governance.

Figure 3: Projected long-term changes in key water cycle variables under SSP2-4.5 (2081–2100 vs. 1995–2014)



Notes: The maps show spatial changes in (a) precipitation, (b) evapotranspiration, (c) runoff, and (d) surface soil moisture as percentages. Color shading indicates the magnitude and direction of change, while hatching represents regions with low model agreement ($< 80\%$). The scenario assumes intermediate emissions and socioeconomic development pathways. (source: IPCC, 2021a)

Global Governance Models for Climate Change and Disaster Risk Management

Global governance for climate change and disaster risk management is built upon international frameworks, institutions, and agreements designed to promote risk-informed sustainable development gains (UNDP, 2022). Key pillars include policy frameworks, institutional coordination, and implementation mechanisms encompassing finance, monitoring, and capacity building. Several global institutions play central roles in this governance architecture:

- **United Nations Framework Convention on Climate Change (UNFCCC 1992)** serves as the foundational treaty guiding international climate policy. Its supreme body, the

Conference of the Parties (COP), has produced major agreements such as the Kyoto Protocol and the Paris Agreement, emphasizing the principle of common but differentiated responsibilities.

- **Paris Agreement under the UNFCCC (2015)** commits to limit global warming to well below 2°C (ideally 1.5°C), with countries submitting Nationally Determined Contributions (NDCs). It also includes mechanisms for transparency, periodic stocktakes, and support for developing nations via finance, technology transfer, and capacity building.
- **Intergovernmental Panel on Climate Change (IPCC 1988)** provides authoritative scientific assessments of climate change and informs international negotiations under the UNFCCC. While not a policymaking body, the IPCC plays a foundational role in evidence-based governance. **Sendai Framework for Disaster Risk Reduction (2015–2030)** is the principal global policy instrument for disaster risk reduction (DRR). Adopted by UN member states, it outlines four priorities: understanding risk, strengthening governance, investing in DRR, and enhancing disaster preparedness. Its inclusive, multi-sectoral approach integrates DRR into broader development and climate agendas (UNDRR, 2022). (UNDRR, 2022).
- **Green Climate Fund (GCF)** is the largest multilateral climate finance mechanism established under the UNFCCC to support low-emission, climate-resilient development in developing countries. It plays a pivotal role in mobilizing the USD 100 billion annual commitment by developed nations (Timperly, 2021; GCF, 2023). These frameworks are interlinked and mutually reinforcing. IPCC assessments underpin UNFCCC targets, while the Sendai Framework complements climate adaptation with resilience building strategies. All of these frameworks are anchored within the overarching 2030 Agenda for Sustainable Development, aligning particularly with Sustainable Development Goal (SDG) 13 on climate action and SDG 11 on building resilient cities and human settlements, thereby ensuring policy coherence across environmental, developmental, and disaster risk reduction domains.

1.2. Climate Change Risk, Natural Disasters, and Preparedness in the OIC Member Countries

Building on the global discourse surrounding climate and disaster risks, this section focuses explicitly on the 57 Organisation of Islamic Cooperation (OIC) Member Countries. Spanning the Middle East, Africa, Asia, and small island states, these countries face increasingly severe climate impacts characterized by rising temperatures, intensified rainfall variability, prolonged droughts, extreme heatwaves, and accelerating sea-level rise (SESRI, 2023).

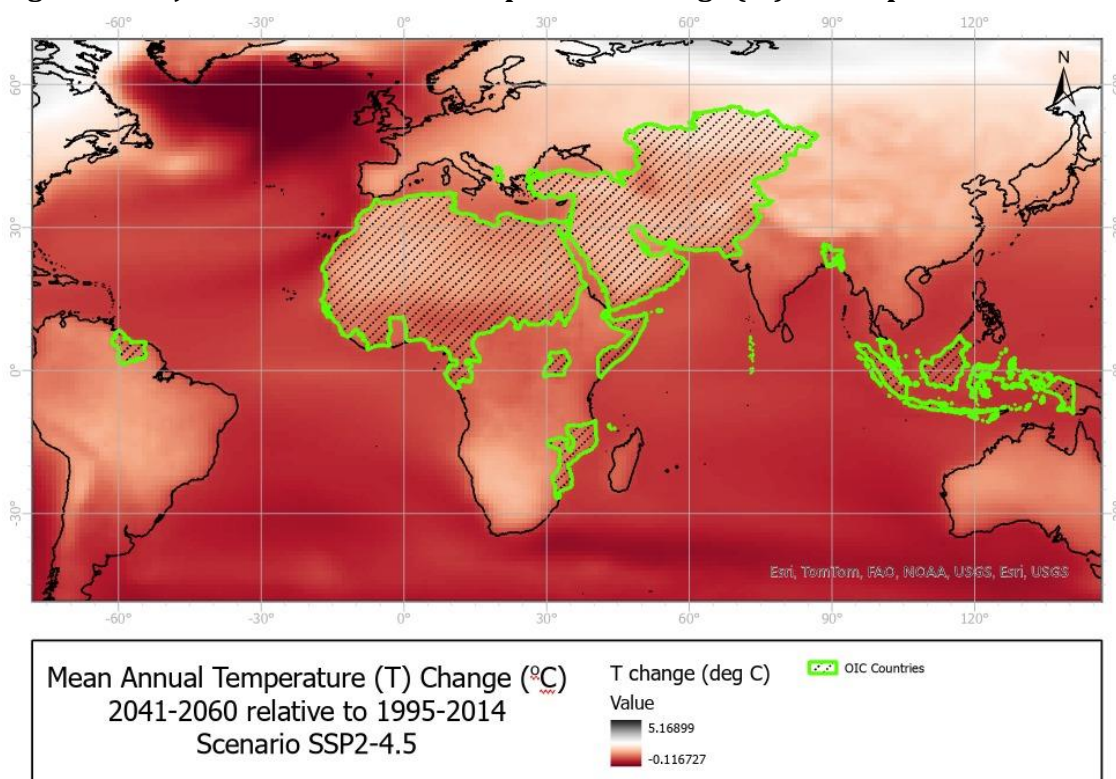
1.2.1 Climate Risk and Hazards in OIC Countries

OIC Member Countries are increasingly exposed to severe climate risks, including rising temperatures, erratic rainfall, prolonged droughts, and accelerating sea level rise (SESRI, 2023). The Middle East and North Africa (MENA), South Asia, and Sub-Saharan Africa have recorded some of the most acute warming trends. During June–August 2023, surface temperature anomalies exceeded +4 °C globally, with MENA and South Asia experiencing anomalies of +2 to +3.5 °C (NASA, 2023). Projections indicate regional warming could reach 4 °C by 2050 under high-emission scenarios, doubling the global average (Fanack Water, 2023). These changes increase risks to health, water availability, agriculture, and energy systems (Ntoumos et al., 2020; Tzyrkalli et al., 2024; Varela et al., 2020; IPCC Atlas). According to the

IPCC (Gutiérrez et al., 2021; Iturbide et al., 2022), even under an intermediate scenario (SSP2-4.5), the Middle East is projected to warm by 3–4 °C by 2041–2060 (**Figure 3.**). At the same time, rainfall variability is intensifying hydrological stress. By 2020, OIC countries were already withdrawing 33.5% of renewable water resources, surpassing the UN water stress threshold of 25% (SESRIC, 2023). Regions like Somalia and Niger have faced severe droughts, including the Horn of Africa drought (2020–2023), which triggered major humanitarian challenges (UNICEF, 2022). Projected precipitation trends highlight further vulnerability. Under SSP2-4.5, annual rainfall could decline by 5%–16% across much of MENA, including Saudi Arabia, Egypt, and Morocco, deepening water scarcity, reducing crop yields, and increasing food insecurity (**Figure 4.**). Conversely, parts of West and Central Africa (e.g., Sahel) may see rainfall increases of 10%–43%, which, while beneficial for water supply, may also intensify flooding and erosion without adequate adaptation.

East Africa (e.g., Somalia, Sudan, Uganda) could see moderate rainfall increases (5%–20%), necessitating flood management measures. South Asia is more varied: Pakistan and Afghanistan may experience declining rainfall, while Bangladesh could see a slight increase (~+5%), potentially raising flood risks in low-lying areas. Southeast Asia (Indonesia, Malaysia, Brunei) is projected to receive 5%–10% more rainfall, increasing risks of urban flooding and landslides.

Figure 4: Projected Mean Annual Temperature Change (°C) for the period 2041–2060



Notes: Projected Mean Annual Temperature Change (°C) for the period 2041–2060 relative to baseline period of 1995–2014 under the intermediate greenhouse gas emissions scenario SSP2-4.5. OIC Member Countries are delineated clearly in green boundary lines.

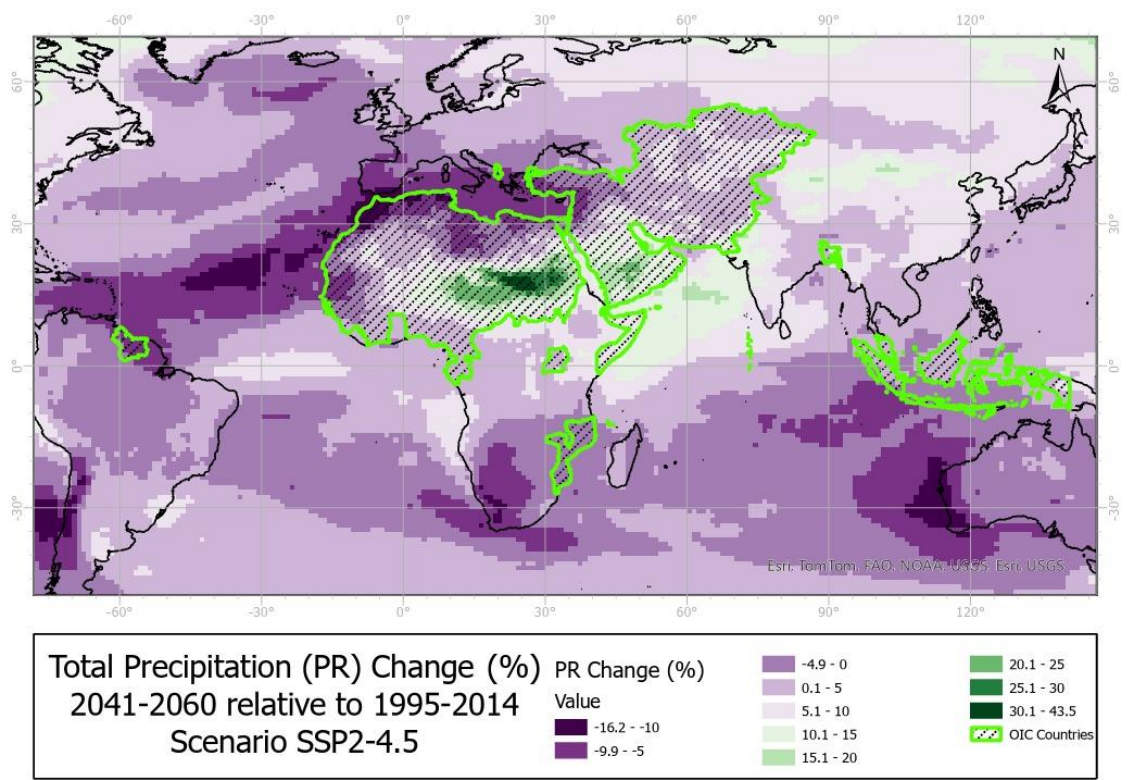
Sea-level rise (SLR) presents an especially urgent threat to low-lying and coastal OIC countries. Since 1880, global sea levels have risen by ~0.21–0.24 meters, with a current acceleration rate

of 3.9 mm/year (NASA, 2023). Projections indicate a further rise of 0.2–0.4 meters by 2050 under SSP2-4.5, with Southeast Asian hotspots exceeding 0.4 meters (**Figure 4**). Countries such as Bangladesh and the Maldives are among the most vulnerable, with Bangladesh potentially losing up to 17% of its land by 2050 and displacing 20 million people (NRDC, 2023).

Most OIC coastal states are projected to experience sea-level rise of +0.15 to +0.30 meters, with severe implications for megacities like Jakarta, Lagos, and Karachi (**Figure 5**). These include increased coastal flooding, saltwater intrusion, erosion of natural barriers, and forced displacement. The threat is exacerbated by weak coastal defenses and high population densities in at-risk areas.

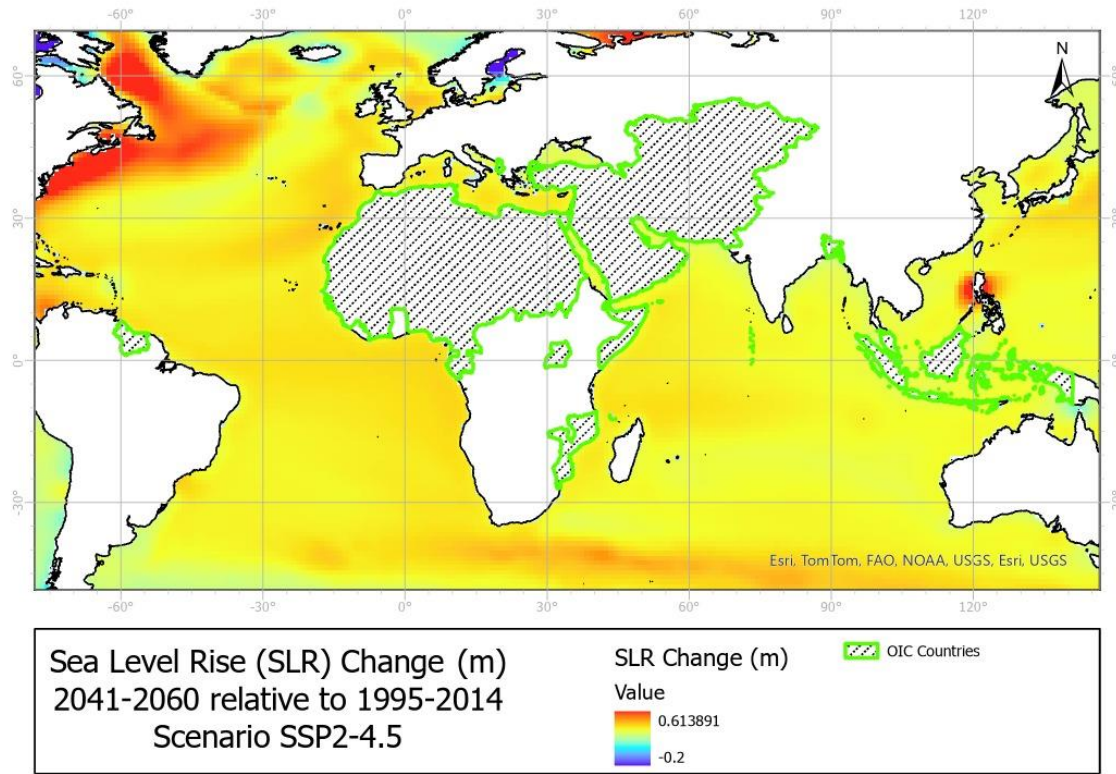
Moreover, higher base sea levels amplify the impact of tropical storms and monsoons, as seen in the 2022 Pakistan floods that displaced over 33 million people and caused widespread damage (World Bank, 2022). Without substantial investment in adaptive infrastructure and coordinated water management, such events are likely to become more frequent and devastating.

Figure 5: Projected changes in total precipitation (rainfall) for the period 2041–2060



Notes: Projected changes in total precipitation (rainfall) for the period 2041–2060 compared to the baseline period 1995–2014, under the intermediate greenhouse gas emissions scenario SSP2-4.5. The precipitation change ranges between -16.2% (significant decrease, shown in dark purple) and +43.5% (significant increase, shown in dark green). OIC Member Countries are delineated clearly in green boundary lines.

Figure 6: Projected Changes In Sea Level Rise (SLR) In Meters For The Period 2041–2060



Notes: Projected changes in Sea Level Rise (SLR) in meters for the period 2041–2060 relative to the baseline period 1995–2014 under the intermediate emissions scenario SSP2-4.5. The SLR ranges from approximately -0.2 meters to +0.61 meters, depicted by color gradients from blue (indicating minimal or slight decrease) to orange and red (indicating significant rise). OIC countries are outlined distinctly in green.

OIC countries face compound climate threats, from heat extremes and shifting precipitation to rising seas, that demand urgent action. Low-lying and arid regions are especially vulnerable due to limited adaptive capacity. A coordinated response is needed to strengthen resilience through improved infrastructure, regional cooperation, and sustainable resource management.

1.2.2 Climate Preparedness: Risk, Vulnerability and Readiness of OIC Member Countries

Preparedness for climate-related disasters among OIC Member Countries can be evaluated through disaster risk management and humanitarian response capacities. The INFORM Risk Index, developed by the United Nations and the European Commission, assesses countries based on their exposure to hazards, societal vulnerability, and coping capacity. The INFORM Risk Index (2025) highlights that many OIC Member Countries, particularly in Africa, face “high” to “very high” risk levels due to their exposure to natural hazards, socio-economic vulnerabilities, and limited institutional coping capacities. Countries such as Somalia, Chad, Mali, Sudan, and Niger are among the most at risk (INFORM Risk, 2025).

According to INFORM Risk Trend 2016–2025 risk has escalated across many OIC Member Countries, with notable increases in Somalia, Mozambique, and Pakistan. Conversely, a few countries, such as Kazakhstan and Uzbekistan, have shown risk reductions, likely due to improvements in governance and infrastructure. These trends are consistent with ND-GAIN findings, which show a decline in average vulnerability among OIC Member Countries from 0.55 in 1995 to 0.46 in 2022. However, adaptation readiness improved only marginally from 0.35 to 0.36, compared to a global increase from 0.38 to 0.43 (See **Table 3**).

Table 3: ND-GAIN Index Average Scores for Global and OIC Countries (1995–2023)

Metric	OIC Member Countries Average		Global Average	
	1995	2023	1995	2023
Vulnerability	0.492	0.465	0.457	0.433
Readiness	0.290	0.327	0.358	0.403

Source: Analysis result based on ND-GAIN data, *except Palestine due to data availability*

The ND-GAIN index measures vulnerability across six sectors (food, water, health, ecosystems, habitat, and infrastructure) and readiness through economic, governance, social readiness to climate impacts. The comparative data between 1995 and 2023 from the ND-GAIN Index reveals that OIC Member Countries have made progress in reducing their climate vulnerability but continue to lag behind global averages in terms of adaptation readiness. Specifically, the average vulnerability score for OIC Member Countries improved and narrowing the gap with the global average from 0.09 to 0.03. This reduction suggests some advances in sectors such as water resource management, health infrastructure, and ecosystem protection, indicating reduced exposure and increased adaptive capacities. However, despite these improvements, OIC Member Countries remain slightly more vulnerable than the global average, highlighting persistent exposure and structural sensitivity to climate shocks.

While 88% of OIC countries have seen reductions in vulnerability, only limited progress has been made in strengthening readiness.

Three distinct readiness pathways (**Table 4**) can be identified across OIC countries:

Improved Readiness

OIC Member Countries such as Saudi Arabia, the United Arab Emirates, Kazakhstan, Qatar, Brunei Darussalam, Türkiye, Bahrain, Oman, Uzbekistan, Malaysia and others, achieved gains in of +0.015 to +0.297 through targeted investments in institutional reform, economic diversification, and infrastructure development, enabling more robust climate adaptation and disaster risk reduction systems.

Declined Readiness

OIC Member Countries like Bangladesh, Syria, Suriname, Afghanistan, Chad, Gabon and others, experienced declines of -0.006 to -0.07, reflecting challenges in governance, political instability and limited implementation capacity including access to climate finance.

Minimal Change

Countries like Libya, Sierra Leone, Cameroon, Côte d'Ivoire, Egypt, Tajikistan, Djibouti, and Guinea exhibited minimal change in readiness (ranging between 0.001 and 0.013).

Differences in readiness are shaped by three core factors:

- Governance: Fragmented governance hinders the implementation of adaptation measures and access to finance.
- Institutional capacity and economic strength: Wealth alone does not guarantee readiness. Effective governance and transparent institutions are essential, as seen in the contrast between resource-rich yet lagging countries like Nigeria and well-performing nations like Qatar or the UAE (Nwokolo et al., 2023).
- Global engagement: Active participation in international climate platforms and access to adaptation finance, exemplified by Morocco, Malaysia, and Jordan, enhances national readiness and enables policy coherence across sectors.

These trends emphasize the need for enhanced institutional development, increased climate finance access, and cross-sectoral planning to strengthen resilience in OIC countries.

Table 4: Classification of OIC Member Countries Based on Readiness Score Change (1995–2023) Using ND-GAIN Index Data

Improve Readiness			Decline Readiness			Minimal Change		
<i>Code</i>	<i>Country</i>	<i>Change</i>	<i>Code</i>	<i>Country</i>	<i>Change</i>	<i>Code</i>	<i>Country</i>	<i>Change</i>
SAU	Saudi Arabia	0.297	COM	Comoros	(0.006)	GIN	Guinea	0.013
ARE	United Arab Emirates	0.243	LBN	Lebanon	(0.007)	DJI	Djibouti	0.010
KAZ	Kazakhstan	0.180	PAK	Pakistan	(0.007)	TJK	Tajikistan	0.008
QAT	Qatar	0.172	BFA	Burkina Faso	(0.022)	EGY	Egypt	0.006
BRN	Brunei Darussalam	0.145	GMB	Gambia	(0.023)	CIV	Cote d'Ivoire	0.005
TUR	Turkey	0.132	TKM	Turkmenistan	(0.024)	CMR	Cameroon	0.005
BHR	Bahrain	0.125	MOZ	Mozambique	(0.024)	SLE	Sierra Leone	0.003
OMN	Oman	0.125	NGA	Nigeria	(0.029)	LBY	Libya	0.001
UZB	Uzbekistan	0.118	GUY	Guyana	(0.034)			
MYS	Malaysia	0.113	GNB	Guinea-Bissau	(0.036)			
AZE	Azerbaijan	0.112	YEM	Yemen	(0.046)			
MDV	Maldives	0.106	UGA	Uganda	(0.046)			
TUN	Tunisia	0.098	SDN	Sudan	(0.047)			
ALB	Albania	0.095	GAB	Gabon	(0.049)			
NER	Niger	0.084	TCO	Chad	(0.056)			
KWT	Kuwait	0.080	AFG	Afghanistan	(0.065)			
TGO	Togo	0.070	SUR	Suriname	(0.067)			
JOR	Jordan	0.062	SYR	Syria	(0.067)			
MAR	Morocco	0.058	BGD	Bangladesh	(0.070)			
IDN	Indonesia	0.054						
BEN	Benin	0.046						
SOM	Somalia	0.042						
KGZ	Kyrgyzstan	0.038						
IRN	Iran	0.034						
IRQ	Iraq	0.031						
SEN	Senegal	0.027						
DZA	Algeria	0.019						
MRT	Mauritania	0.016						
MLI	Mali	0.015						

Source: Analysis result based on ND-GAIN data

1.3. Green Finance and SDGs

Green finance refers to financial resources allocated to projects that contribute to environmental sustainability. These may include investments in renewable energy, clean water systems, sustainable agriculture, and low-carbon infrastructure and other projects supporting climate adaptation and mitigation objectives. Instruments such as green bonds, sustainability-linked loans, and equity financing are commonly used, and the common thread is the focus on generating positive environmental outcomes alongside economic gains. In the context of sustainable development, green finance plays a pivotal role by aligning financial flows with long-term environmental objectives without compromising economic returns.

The Sustainable Development Goals (SDGs) set out a shared global agenda to promote inclusive growth, protect the environment, and ensure long-term resilience. Dzebo et al. (2019) found the close interlinkage of Paris Agreement targets and United Nation 17 SDGs. Some interconnections are stronger as large number of climate actions support several SDGs, particularly SDG 7 (affordable and clean energy), SDG 15 (life on land), SDG 2 (zero hunger), SDG 11 sustainable cities and communities, SDG 6 (clean water and sanitation), and SDG 17 (partnerships for goals). Surprisingly, SDG 13 (climate action) only provides a moderate connection given that the Paris Agreement goes beyond these specific SDGs as climate action is a concern for the whole spectrum of sustainable development. Furthermore, SDG targets are relatively narrow, focusing on resilience and adaptive capacity, policy mainstreaming, and education & awareness. These connections reflect that mobilization of green finance directly contributes to achievement of multiple SDGs, for example investments in renewable energy address energy access and emissions reduction simultaneously, while financing for sustainable land use can promote food security and environmental conservation.

In practice, green finance serves as a mechanism to channel capital into sectors where financial returns align with environmental benefits. It also supports the broader call under SDG 17 by fostering partnerships through blended finance models that bring together public, private, and philanthropic fundings. This approach holds particular importance for emerging and developing economies, including OIC Member Countries, where financing gaps remain substantial. To help bridge these gaps, innovative and inclusive financial instruments, such as green sukuk and sustainability-linked facilities, are gaining traction. However, due to institutional and resource constraints, many OIC countries still require international support to strengthen their capacity and fully leverage these mechanisms for sustainable development.

From an Islamic finance perspective, green finance is also closely aligned with core ethical and social principles. The principles of *Maqasid al-Shariah* reinforce the alignment between green finance and the SDGs. These principles emphasize balance (*mizan*), intergenerational justice (*'adalah*), and stewardship (*khalifah*), all of which are consistent with the goals of environmental sustainability and inclusive development (CIBAFI, 2022). Thus, green finance, when embedded within Shariah-compliant frameworks, becomes both a vehicle for SDG delivery and an expression of Islamic ethical values. Islamic financial instruments such as green sukuk offer a practical avenue to mobilize capital for sustainable development, especially when supported by appropriate regulatory frameworks and institutional cooperation.

In conclusion, green finance not only mobilizes capital for climate and environmental priorities but also serves as a key metric for tracking financial sector alignment with the global sustainability agenda. Strengthening its role, especially in OIC Member Countries, requires enabling policies, robust disclosure standards, and stronger institutional capacities.

1.4. Current Global Trends in Green Finance

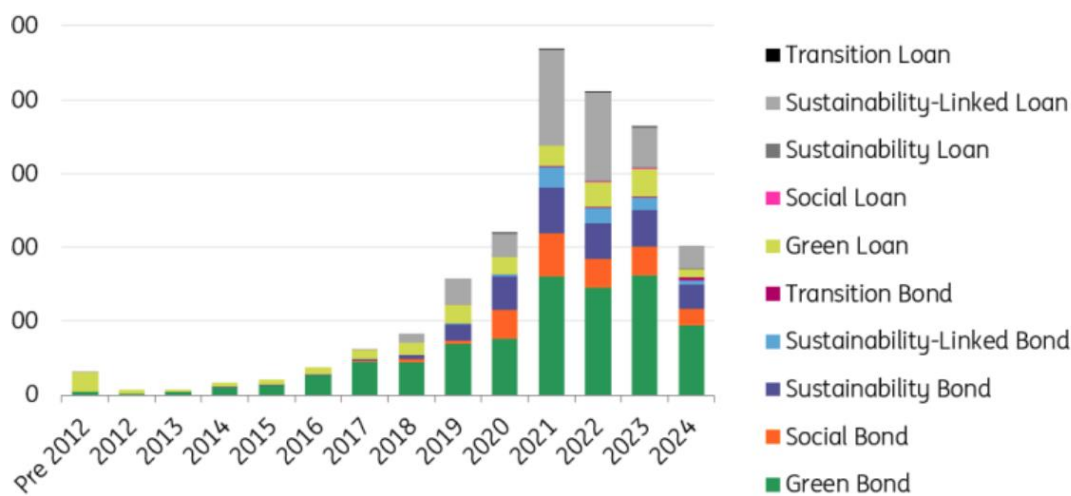
Green finance has evolved significantly in recent years, transitioning from a niche segment to a mainstream pillar of the global financial system. This transformation is driven by rapid growth and innovation across multiple sectors. In 2023, global investment in clean energy reached an estimated US\$1.7 trillion, accounting for around 60% of total energy investment (IEA, 2023). This figure notes a sharp acceleration compared to fossil fuel investments, which stood at US\$1 trillion. While the investment ratio between clean energy and fossil fuels was roughly 1:1 over the past five years, by 2023, it had shifted to approximately \$1.70 spent on clean energy for every \$1 on fossil fuels. Key drivers behind this shift include the surge in renewable power investments (notably solar), rising demand for electric vehicles, improved cost-competitiveness

amid volatile fossil fuel prices—particularly during periods of geopolitical uncertainty, enhanced policy support, and stronger alignment with climate and energy security objectives.

Multilateral development banks (MDBs) play a vital role in supporting climate financing across OIC countries (SESRIC, 2021). The volume of climate finance received by these countries rose significantly—by 1.5 times—from US\$8.5 billion in 2015to US\$13 billion in 2020. On average, approximately 60% of annual climate finance was directed toward mitigation projects, while the remaining 40% supported adaptation efforts. The energy sector emerged as the primary recipient, accounting for about 70% of the total financing. The financing to this sector is allocated for transport and storage, water supply and sanitation, agriculture, forestry, fishing and disaster risk reduction. Importantly, effective management of climate finance in OIC countries presents an opportunity to bridge socio-economic development goals with environmental sustainability imperatives.

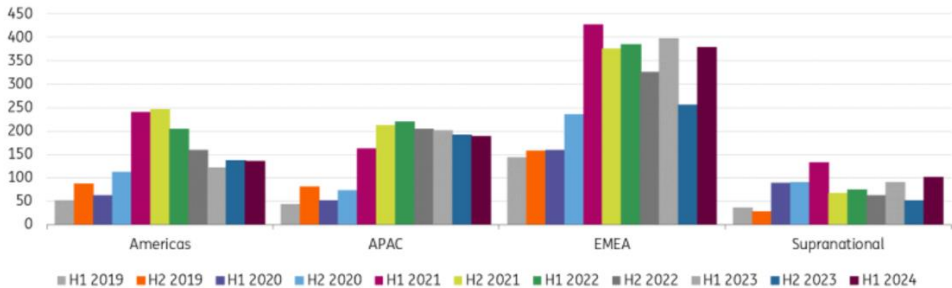
A key trend driving this momentum is the rapid growth of green and sustainability-linked financial instruments. The sustainable debt market (comprising green, social, sustainability, and sustainability-linked bonds and loans) has expanded significantly. Global sustainable finance issuance peaked in 2021 with gradually decreasing in the following years (BloombergNEF, 2024). Green bonds remain the largest segment, but sustainability-linked bonds (SLBs) and loans are also emerging fast. Sustainable-debt issuance climbed to US\$ 800 billion in the first half of 2024, increased from US\$640 in the same period of 2023, with Europe leading as the largest sustainable finance issuer supported by a comprehensive and advanced ESG regulation ecosystem (Chang & Garvey, 2024). These innovative instruments tie financing terms to borrowers’ sustainability performance, incentivizing companies to meet targets like emissions cuts. Overall, despite economic uncertainties due to geopolitical risk, the appetite for green finance continues to rise. In addition, the size for global investment in energy transition reached US\$1.8 trillion in 2023, an increase of 17% from the previous year (BloombergNEF, 2024), reflecting steady-increase in supporting climate transition and adaptation.

Figure 7: Global Sustainable Finance Issuance (US\$ billion)



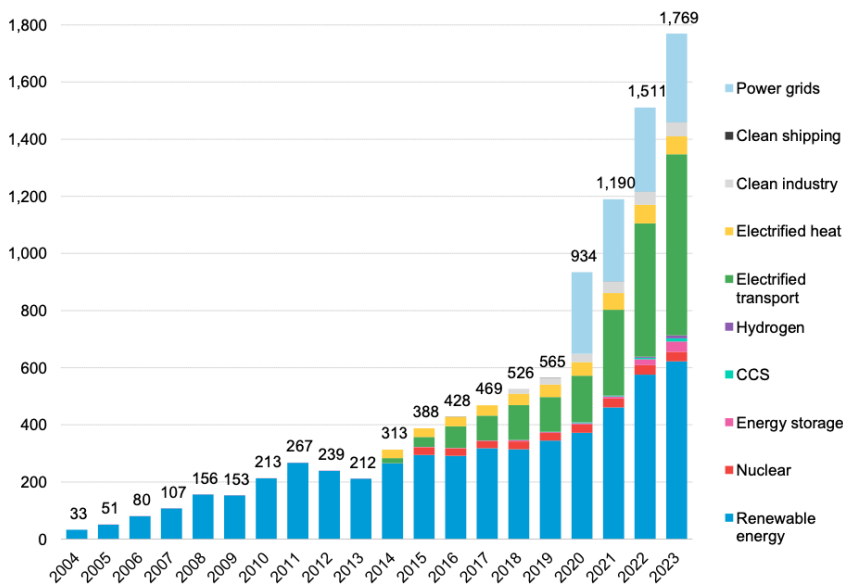
Source: Chang & Garvey, 2024

Figure 8: Sustainable Finance Issuance by Region (US\$ billion)



Source: Chang & Garvey, 2024

Figure 9: Global Investment in Energy Transition, by Sector (US\$ billion)



Source: BloombergNEF (2024)

Regulatory and policy frameworks are playing a crucial role in shaping these trends. Governments and international bodies are increasingly introducing standards to increase green finance’s market integrity. The European Union’s Sustainable Finance Taxonomy, for example, provides a detailed classification of what counts as environmentally sustainable investment, influencing capital allocation far beyond Europe (Krämer, 2022). Many other countries have developed or are developing their own green taxonomies modeled on global best practices. As of 2024, there were 47 sustainable finance taxonomies issued globally, covering most advanced economies and an increasing number of emerging markets (Stewart et al., 2024). These taxonomies provide sustainable definition, mitigate green washing, support SDGs and build

market confidence. Likewise, climate-related financial disclosure is becoming mandatory in many jurisdictions. Central banks and regulators are also integrating climate risks into their supervisory practices, conducting climate stress tests on financial institutions. These regulatory trends vary by region, with Europe generally leading on stringent standards, while other regions gradually follow, but collectively creating a more enabling environment for green finance globally.

There are **regional differences in green finance adoption**. Developed markets currently dominate green financing volumes due to larger capital markets and stronger policy support. For example, Europe has been a hub for green bonds and ESG investing, and China has been the largest market for energy transition investment (BloombergNEF, 2024). By contrast, many developing countries, including several OIC members, still account for a small share of global green investment, often due to smaller financial markets or higher investment risks. However, momentum is building across all regions. In the Middle East, for instance, Gulf countries (such as the UAE, Saudi Arabia and Qatar) have begun tapping into green bonds/sukuk and launching sustainability-linked financing to fund climate and renewable energy projects (Aziz, 2025). In Southeast Asia, Malaysia and Indonesia are pioneering Islamic green finance. In summary, global green finance is on a robust upward trajectory, characterized by rapid growth in sustainable investments, innovation in financial products, stronger regulatory frameworks, and gradually widening investor base across regions, all of which are supporting the world towards a greener financial system.

1.5. Different Funding Models of Green Projects

Several funding models exist to support green finance initiatives, tailored to various recipient sectors, including governments, private enterprises, and community-led projects. This section offers an overview of key financing mechanisms. These models are crucial for mobilizing capital and ensuring the financial viability of green projects.

1.6. Global Challenges In The Green Finance Project Execution

Despite its rapid growth, green finance faces several execution challenges that limit its scalability and effectiveness, particularly in emerging markets and in OIC Member Countries. Key barriers include:

- **Lack of Awareness:** While advancements in climate risk assessment are gaining traction in conventional finance, particularly in Western markets, awareness within the Islamic finance ecosystem remains limited. Bridging this gap is essential. Islamic finance must deepen its understanding of climate-related financial risks and the evolving challenges surrounding access to sustainable financing. Enhancing awareness is a critical first step toward enabling meaningful participation in global climate action and ensuring the sector does not fall further behind.
- **Regulatory Inconsistencies and Fragmentation:** There is a lack of harmonized global standards for green classification, leading to fragmentation across jurisdictions. Different countries and institutions use varying definitions and criteria for green projects, which raises transaction costs, creates confusion for investors and potentially increase green washing risk. As an example, by 2024 around 47 sustainable finance taxonomies had been introduced worldwide, but their methodologies vary widely (Stewart et al., 2024). In addition, there is a significant gap in the taxonomies coverage. While roughly three-quarters of advanced economies have implemented such framework, only around 10% of emerging and developing economies have done the same. This fragmentation can discourage cross-

border green investments, particularly for emerging economies where consistent classification tools are most needed. In some markets (including several OIC countries), supportive policies for green finance are nascent or inconsistent, making it harder to develop robust project pipelines, undermine trust and increase the perceived risk of entering these markets. In short, regulatory uncertainty or fragmentation across countries remains a major challenge to unlocking the full potential of green capital flows.

- **Lack of Standardized Metrics and Disclosure:** Closely related to the above, there is no universal framework for measuring and reporting environmental impact. Currently, sustainability reporting is still evolving with gradual implementation and more accelerated progress in western hemisphere. This lack of a standardized and recognized measurement system can also be viewed as one of the biggest threats to effective green finance and ESG investment. The absence of common metrics, disclosure standards, and verification infrastructure also fuels greenwashing risk, as inconsistent reporting allows some to overstate their environmental benefits. This gap in data and transparency undermines investor confidence in green projects and complicates performance tracking.
- **Higher Financial and Market Risks:** Green projects often face higher perceived risks, especially in emerging markets. New technology investment such as in renewable energy and nature-based solutions requires substantial amounts of funding but lack long track records. Policy and political risks could also impact the uncertainty in government tariffs or subsidies. Additionally, many sustainable projects are capital-intensive with returns realized over a longer term. IEA (2024) found that the cost of capital for clean energy (solar photovoltaic) projects in emerging economies is more than *double* that in developed countries due to elevated risk premiums given a country's perceived risk. Furthermore, a solar farm in South Africa may be not intrinsically riskier than one in Germany, however, investors demand a much higher return in South Africa because of perceived macroeconomic risks (Thomson, 2023). These higher financing costs make many green projects in developing OIC countries financially unviable. Difficulty in pricing and mitigating risk is a major barrier that can impede green project execution.
- **Limited Access to Affordable Financing:** In many developing OIC countries, accessing affordable capital for green projects remains a major hurdle. Local financial markets are often shallow, and international investors tend to demand high-risk premiums or guarantees. Even when funding is available, high interest rates make many projects financially unviable, especially compared to the lower borrowing costs in advanced countries. This financing gap highlights the need for concessional funding, blended finance and innovative instruments to make green investments feasible. In addition, limited financial literacy and technical capacity in some regions further restrict access, particularly for smaller businesses and local communities.

Addressing these execution challenges is essential to unlock the full potential of green finance. Harmonizing standards (e.g. through globally accepted taxonomies and reporting rules), improving transparency, de-risking investments via guarantees, policy stability, or international collaboration, and expanding access to affordable capital (through development banks and innovative financing structures) are all important steps. Without addressing these barriers, developing economies will continue to face significant challenges in scaling up green finance, further widening the gap with advanced economies despite their urgent needs and constrained capacities.

1.7. The Role of Key Stakeholders

Achieving a sustainable financial ecosystem requires concerted efforts from multiple stakeholders. In the context of green finance, the following actors play pivotal roles, each bringing unique contributions to policy development, funding, and capacity-building:

- **Multilateral Organizations and Development Banks:** Institutions like the World Bank, Islamic Development Bank (IsDB), Asian Development Bank, and United Nations are at the forefront of mobilizing and directing funds toward green initiatives. They often provide the concessional loans, grants, guarantees for climate projects, while also helping governments design policies and build technical capacity. For example, in 2020, multilateral development banks (MDBs) committed \$66 billion to climate finance, with nearly 60% directed to low- and middle-income countries (SESRIC-OIC, 2022). The IsDB, for example, has supported Islamic green finance by issuing green sukuk and setting up dedicated climate facilities. Other international funds, like the Green Climate Fund and Global Environment Facility, also play a crucial role in directing climate finance toward developing countries. These institutions serve as connectors, mobilizing capital, sharing knowledge, and fostering public-private partnerships to scale investment.
- **National Governments:** Governments set the tone for green finance through policy and regulation. In many OIC countries, this includes launching national green finance strategies, green bond/sukuk frameworks, and mandatory disclosure requirements. Indonesia was the first to issue a sovereign green sukuk in 2018 and continues to raise funds for renewable energy and sustainable infrastructure. Countries like Malaysia and the UAE have also introduced regulatory tools to support Islamic green finance. Beyond direct funding, governments stimulate investment by setting clean energy targets, offering tax incentives, and embedding climate risks in planning and budgeting. Their dual role—as both market participants and policymakers—makes them central to green finance growth.
- **Private Sector Financial Institutions:** The private sector brings the capital and innovation needed to scale green finance. Banks, insurers, asset managers, and institutional investors are increasingly committing to sustainability, with alliances like Glasgow Financial Alliance for Net Zero (GFANZ) representing has gathered 450 financial firms, from 45 countries, managing over \$130 trillion in assets pledged to net-zero targets (GFANZ, 2021). Many financial institutions, including in OIC regions, are launching green lending products, ESG investment funds, and green sukuk offerings. These institutions are also developing new tools, such as sustainability-linked loans and green sukuk, that broaden green financing options. Crucially, private capital is key to closing the funding gap, and its active involvement helps mainstream climate considerations into financial decisions.

All these stakeholders increasingly recognize that collaboration is key. Multilateral banks often co-finance projects with private institutions, using concessional capital to reduce risk. Governments work with industry players and international partners to develop roadmaps and regulatory frameworks, as seen in joint efforts between the World Bank, IsDB, and OIC Member Countries. A good example is the ICMA–IsDB–LSEG guidance on green sukuk, which offers practical tools for issuers by aligning global standards with local needs. Each stakeholder brings something unique, whether it's capital, policy leverage, innovation, or expertise. However, they share a common goal: mobilizing finance at scale to drive sustainable development and climate action, especially in OIC countries facing urgent environmental and economic challenges.

1.8. Lesson Learnt for OIC Countries

As green finance matures globally, there are several key lessons and best practices that OIC countries can draw upon and tailor to the Islamic finance context:

- **Bridging the Awareness Gap:** A key lesson from global developments is the importance of building awareness and understanding of climate-related financial risks. While conventional finance has made significant strides in integrating climate risk into financial decision-making, Islamic finance is still in the early stages of this journey. Closing this awareness gap is crucial. Deepening knowledge within the Islamic finance sector about climate risk, its implications, and the barrier to sustainable financing is an essential step to ensure the sector plays a meaningful role in climate action and keeps pace with global financial innovation.
- **Strong Policy Frameworks and Commitments Matter:** Countries that have made clear policy commitments to sustainability tend to attract more green investment. For OIC members, aligning national development plans with climate goals (e.g. setting emissions targets or renewable energy goals under the Paris Agreement) sends a positive signal to investors. The experience of emerging green finance leaders shows that enacting supportive regulations, such as tax incentives for green bonds/sukuk, sovereign green sukuk issuance, or mandatory climate risk disclosure for financial institutions, can significantly boost market activity. Providing clear mandates to financial sector activities to incorporate climate risk in their operations and building robust monitoring framework and regulations, as well as developing national green taxonomies to define eligible green activities are also effective strategies to provide clarity and combat greenwashing. *Lesson:* OIC countries should embed climate and sustainability considerations into their financial regulations and development strategies to lay a foundation for green finance growth.
- **Leverage Islamic Finance's Synergy with Sustainability:** Islamic finance principles naturally align with many sustainability objectives. For OIC countries, positioning green finance as a means to achieve Maqasid al-Shariah (the aspirational objectives of Shariah) can build up support. There is evidence that Islamic financial development can contribute to sustainability; one empirical study across OIC countries found that growth in Islamic financial assets is associated with carbon emission reduction through funding renewable energy projects (Irfany et al., 2024). However, the same study noted Islamic banks sometimes still finance carbon-intensive activities, highlighting room for improvement. *Lessons:* Islamic finance institutions should actively integrate ESG criteria into their operations, effectively becoming vehicles for ethical and green investing which aligns with Islamic ethics and fulfilling their true objective of Maqasid al-Shariah. By doing so, they can capitalize on the growing consumer preference for ethical finance, which was reflected in increasing demand from western countries on the sovereign green sukuk, such as issued by the Indonesian Government.
- **Develop Local Green Financial Markets (especially Green Sukuk):** Some OIC countries have shown that sovereign green sukuk can lay the groundwork for broader market growth. The cumulative experience indicates OIC countries should tap into Islamic capital markets to fund green projects, not only through government debt but also by encouraging corporations and financial institutions to issue green and sustainability sukuk. Other countries can replicate this by creating clear guidelines for sukuk issuance aligned with green standards (as provided in the new ICMA-IsDB-LSEG guidance). *Lesson:* Building a green sukuk market will enable OIC countries to mobilize large-scale funding from both

Islamic and conventional investors, given that sustainable sukuk appeal to a wide investor base seeking Shariah-compliant and green assets.

- **Strengthen Collaboration and Knowledge Sharing:** Joint efforts, between governments, private sector players, and development partners, can help overcome local barriers such as weak project pipelines, capacity constraints, or investor awareness. Engaging in global sustainable finance forums and establishing national task forces are effective ways to coordinate action. It's important for OIC policymakers and financial regulators to actively participate in international forums on sustainable finance to stay updated on evolving standards and instruments. Building local expertise in climate risk assessment, green project design, and financial structuring is also critical to reduce reliance on external support. Lesson: collaboration is a key to overcome challenges in green financing access and other capacity constraints, create synergy, either nationally or internationally, to ensure address the gaps, build conducive environment and relevant infrastructures, as well as support global standard harmonization to avoid regulatory gaps.
- **Integrate Social and Environmental Objectives (the SDG approach):** A holistic lesson from global best practice is that green finance should be viewed as part of the broader sustainable development agenda, not in isolation. OIC countries would benefit from ensuring that green finance initiatives also yield socio-economic co-benefits such as job creation, poverty reduction, and improved public health. Islamic finance has tools for this integration: Islamic social finance instruments, such as *zakah* (alms), *waqf* (endowments), *qard hasan* (benevolent loans), which can be leveraged alongside commercial green finance to fund climate adaptation for vulnerable communities or renewable energy access for the poor. Blending these with traditional finance could amplify impact. For example, a waqf fund could support community solar projects that a commercial bank might find too small or risky. This blended approach resonates with SDG principles of leaving no one behind. Lesson: OIC countries can pioneer models of sustainable finance that combine the Islamic philanthropy with market-based green finance, thereby addressing climate change and social justice together – a dual objective very much in line with the SDGs and Islamic ethics.
- **Promote Innovation:** OIC country experiences show that innovation, both in policy and instruments, is key to building a strong green finance ecosystem. For example, Indonesia's climate budget tagging links national planning with a pipeline of green projects, while its macroprudential tools align climate goals with financial stability and financial inclusion. The alignment between Indonesia's emerging innovations and the UK's mature green finance ecosystem offers a practical template for OIC countries to strengthen resilience, attract green investment, and scale up Islamic finance (via instruments like green sukuk) effectively.

In summary, OIC Member Countries stand to gain by adopting a proactive stance on green finance, learning from what has worked elsewhere while leveraging their unique Islamic finance strengths. The path forward involves robust policy support, market innovation, capacity enhancement, and a conscious alignment of finance with both environmental and social goals. By internalizing these lessons, OIC countries can better navigate their climate risks and development needs, financing a transition that is not only green, but also inclusive and consistent with Islamic values.

CHAPTER 2: THE ROLE OF GREEN ISLAMIC FINANCE IN COMBATING THE ADVERSE EFFECTS OF CLIMATE CHANGE AND NATURAL DISASTERS

This chapter examines the role of Islamic finance in addressing the negative impacts of climate change and natural disasters, with a particular focus on the potential of Islamic finance instruments to advance green finance and support disaster risk reduction (DRR) strategies. Therefore, following an overview of the global context and the theoretical framework underpinning climate change and DRR, the chapter explores the potential of Islamic finance and its relevance to mitigating climate-related financial risks by comparing Islamic finance instruments with its conventional peers in promoting sustainable development in the OIC Member Countries.

2.1. Climate Change and Natural Disasters: Global Context and Relevant Frameworks

Climate change, defined as significant and long-term shifts in average weather patterns, stands as one of the foremost challenges facing humanity in recent decades. Primarily driven by anthropogenic greenhouse gas (GHG) emissions, climate change demands urgent attention (IPCC, 2021; UN, 2015). For this reason, climate change is central to several Sustainable Development Goals (SDGs), including poverty alleviation (SDG 1), food security (SDG 2), sustainable urban development (SDG 11), and climate action (SDG 13), all framed by the principle of “leaving no one behind” (UN, 2015).

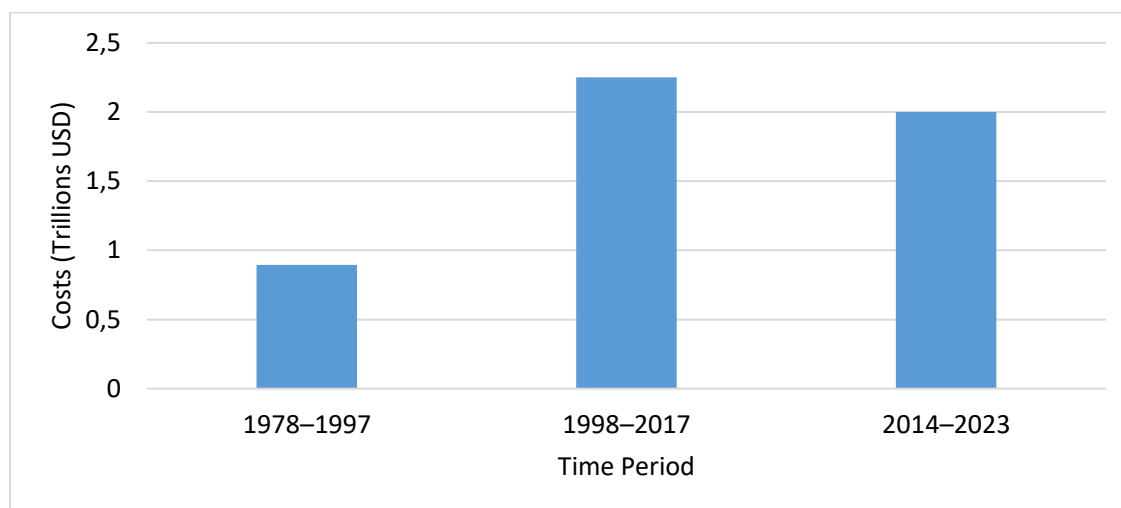
Scientific research consistently underscores that the rate of climate change is occurring at an unprecedented pace in the history of human observation. Global average temperatures have risen by approximately 2°F (about 1.1°C) during the twentieth century, and this warming trend is expected to persist unless substantial mitigation strategies are implemented (IPCC, 2021). The increasing pace of climate change is not only contributing to rising temperatures but also amplifying the frequency and intensity of extreme weather events such as heatwaves, droughts, floods, and tropical cyclones. These events pose significant and growing risks to both ecological systems and human societies around the globe (UNDRR, 2020; IPCC, 2021).

The detrimental effects of climate-induced natural disasters extend well beyond environmental degradation and directly impact human well-being. These impacts include worsening water scarcity, reduced agricultural output, heightened food insecurity, increased public health threats, damage to critical infrastructure, and disruptions to essential services, including sanitation, education, energy, and transportation (World Bank, 2020; UNDRR, 2019a). Such consequences exacerbate existing vulnerabilities, particularly in economically disadvantaged regions, and threaten to reverse or even halt progress toward the achievement of the SDGs (UNDRR, 2015).

2.1.1. Major Challenges Caused by Climate Change and Natural Disasters

The World is witnessing an increasing frequency and severity of natural disasters principally because of unprecedented climate change and over the past five decades, the global frequency of climate-related natural disasters has increased significantly. The Climate Risk Index reported that between 1993 and 2022, more than 9,400 extreme weather events were recorded and these extreme events killed almost 800,000 people and caused economic damages totalling approximately \$4.2 trillion.

Figure 10: Economic Cost of Climate Related Natural Disasters over 5 Decades



Sources: Statista, Germanwatch, WMO

Figure 9 shows the global economic costs of climate-related disasters (including floods, hurricanes, droughts, and wildfires) over the past five decades. These figures reflect a clear upward trend in the financial toll of extreme weather events driven by climate change. However, the World appears to have experienced the worst climate-related disasters during the 1998-2017 period.

According to the OIC Statistical Outlook 2021, the upward trend also holds true for the OIC countries group in which the number of natural disaster occurrences increased from 573 in the period 1991-2000 (21.2% of world total) to 785 (22.5% of world total) in the period 2011-2020. The cost of damages as a result of natural disasters followed two different trends for the world and OIC countries group. While the global economic cost of natural disaster damages exceeded 1.7 trillion USD in the 2011-2020 period, nearly 1 trillion USD more than its 1991-2000 level, the OIC countries group has recorded declines in the cost of natural disaster damages from 60 billion USD in the 1991-2000 period to 42 billion USD in the 2011-2020 period.

The United Nations Inter-Agency Task Force on Financing for Development reported that from the global perspective, financing gaps are largest in middle-income countries (MICs) and that relative to available resources and capacity to mobilize additional resources domestically, least developed countries (LDCs) and low-income Countries (LICs) face the most significant financing gaps, with estimates ranging between around 15 per cent and 30 per cent of their respective GDPs. Although this data is global, many OIC Member Countries, particularly those in the MENA region, are part of the developing world and are likely to experience similar challenges and according to the Overseas Development Institute (ODI) the international public climate finance in the MENA region is concentrated in a few countries, with Egypt and Morocco receiving 80% of the total approved climate finance and this indicates a disparity in funding distribution, leaving other nations underfunded in their climate adaptation efforts. This clearly indicates the level of vulnerability of the global, regional and country level economies when it comes to handling the climate-related natural disasters and this makes the need of green Islamic Finance imperative.

On the other hand, the infrastructural damage caused by unprecedented climate change is taking its toll on the global economy. Climate change threatens transport, energy, and water systems, thus requiring significant investment in resilience to withstand the shocks arising out of climate change related impacts on infrastructural assets. Coastal transport infrastructure faces threats from sea level rise and extreme weather; transport infrastructure assets exposed may reach \$35 trillion in 136 major port cities by 2070, (Nicholls, et al. (2008)). According to the report on the impact of climate risk on the energy system issued by the Council on Foreign Relations in 2019, direct climate impact costs on the energy sector in some cases may range from \$34 – 112 billion by 2050, based on emissions and adaptation levels; and higher temperatures may also reduce solar efficiency and energy generation in the warm regions.

2.1.2. Institutional Structures for Climate Change and DRR: Global Frameworks and Bodies

In response to the increasing frequency and severity of climate-induced natural disasters, the global community has launched several major initiatives including a set of international frameworks, institutions, and agreements to strengthen disaster risk reduction, particularly in vulnerable regions such as the Global South and many OIC countries. These initiatives aim to enhance preparedness, response, resilience, and recovery capacity through international cooperation, financing mechanisms, and technical assistance (UNDP, 2022). All of these frameworks are anchored within the overarching 2030 Agenda for Sustainable Development, aligning particularly with climate action (SDG 13) and building resilient cities and human settlements (SDG 11), thereby ensuring policy coherence across environmental, developmental, and disaster risk reduction domains. The following provides a concise overview of the principal initiatives aimed at addressing climate change and disaster risk reduction.

United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol and Paris Agreement

The United Nations Framework Convention on Climate Change (UNFCCC), established in 1992, is an international treaty with near-universal participation, comprising 198 Parties. It acknowledges the imperative to prevent dangerous anthropogenic interference with the climate system. The UNFCCC's Conference of the Parties (COP) serves as the highest decision-making authority, overseeing the development and implementation of international climate policies, including landmark agreements such as the Kyoto Protocol and the Paris Agreement. The Convention articulates the principle of common but differentiated responsibilities, assigning a leading role to developed countries in mitigating greenhouse gas emissions.

The Kyoto Protocol, adopted in 1997 under the auspices of the UNFCCC, represents a landmark international agreement aimed at combating global climate change by setting binding greenhouse gas emission reduction targets for developed countries. Unlike the UNFCCC, which established broad commitments, the Kyoto Protocol operationalized these goals by specifying quantifiable reduction obligations for parties, reflecting the principle of common but differentiated responsibilities. Although it marked a significant step toward global climate governance, the Kyoto Protocol faced challenges including limited participation by major emitters and the exclusion of developing countries from binding commitments, which influenced its overall effectiveness and paved the way for subsequent agreements like the Paris Agreement.

Paris Agreement is a legally binding international treaty on climate change, adopted by 195 parties at the 2015 UN Climate Change Conference (COP21) in Paris. It aims to limit global warming to well below 2°C (ideally 1.5°C) and to strengthen countries' ability to deal with

climate impacts. The Paris Agreement requires countries to submit and update Nationally Determined Contributions (NDCs) (national climate action plans) and has mechanisms for transparency and a global stock take every five years to assess collective progress as the monitoring instrument. It also provides frameworks for climate finance, technology transfer, and capacity-building to support developing nations.

Sendai Framework for Disaster Risk Reduction (2015–2030)

Sendai Framework for Disaster Risk Reduction (SFDRR) represents the primary international policy instrument for guiding disaster risk reduction efforts globally. Adopted by UN Member States at the Third United Nations World Conference on Disaster Risk Reduction held in Sendai, Japan, in 2015, it provides a non-binding yet comprehensive framework to mitigate the negative consequences of both natural and human-induced hazards.

Guided by the priorities outlined in the Sendai Framework for Disaster Risk Reduction (UNDRR, 2015), effective DRR emphasizes five core pillars: prevention, preparedness, mitigation, response, and recovery. These strategies integrate various components such as risk identification, governance, investment, and recovery into a cohesive framework aimed at reducing impacts of natural disasters. The critical components of DRR by SFDRR are such:

- Understanding Disaster Risk:
- Risk Identification, Prevention, and Mitigation
- Strengthening Disaster Risk Governance
- Investment in Early Warning Systems (EWS)
- Post-Disaster Recovery and “Building Back Better”
- Integrating DRR into Development Planning

SFDRR also sets out seven global targets to be achieved by 2030, including substantial reductions in mortality and economic losses induced by natural disasters and increasing the number of countries with national and local DRR strategies. A distinguishing feature of the Sendai Framework is its emphasis on an inclusive, “all-of-society” approach and the integration of disaster risk reduction into broader sustainable development and climate adaptation agendas.

2.1.3. The Main Global Financial Initiatives on Climate Change and DRR

Green Climate Fund (GCF): Established in 2010 under the financial mechanism of the United Nations Framework Convention on Climate Change (UNFCCC), the Green Climate Fund is the largest dedicated multilateral fund for addressing climate change. Mandated to support developing countries in pursuing low-emission and climate-resilient development pathways, the GCF is accountable to the Conference of the Parties (COP) and operates under its guidance. The Fund allocates resources equally between mitigation and adaptation activities and reports annually to the COP on its performance and governance (GCF, 2023). Alongside complementary mechanisms such as the Global Environment Facility (GEF) and the Adaptation Fund, the GCF plays a central role in mobilizing international climate finance, including contributions toward the collective pledge by developed countries to provide USD 100 billion annually to support climate action in developing nations—a goal originally targeted for 2020 (Timperly J., 2021).

UNFCCC Adaptation Fund: The **Adaptation Fund**, established under the **Kyoto Protocol** in 2001, finances adaptation projects in developing countries that are particularly vulnerable to climate change. These projects include climate-resilient agriculture, water management, ecosystem protection, and community-based disaster risk reduction (DRR) strategies. The fund is primarily supported by **Certified Emission Reduction (CER)** proceeds and international contributions.

Global Shield against Climate Risks: Launched at COP27 by the G7 and V20 (Vulnerable Twenty Group), it aims to provide pre-arranged financing and insurance-based solutions for climate and disaster risks. The initiative includes a range of tools such as contingency funds, insurance mechanisms, and social protection schemes to enhance climate resilience.

This initiative aligns with existing Islamic financial structures like Takaful and Retakaful systems, providing an opportunity for OIC countries to adopt risk layering and financial preparedness strategies (InsuResilience Global Partnership, 2023).

Climate Risk and Early Warning Systems (CREWS) Initiative: The CREWS Initiative, launched by France, the World Meteorological Organization (WMO), and various UN partners, focuses on strengthening early warning systems, particularly in Least Developed Countries (LDCs) and Small Island Developing States (SIDS). Funded through voluntary contributions from donor nations, the initiative supports activities such as building forecasting infrastructure, training personnel, and raising community awareness about disaster risks. Several OIC nations, including Mali, Bangladesh, and the Comoros, have received support from CREWS to develop or improve their national early warning systems (WMO, 2022).

The InsuResilience Global Partnership: Established by the G20 and V20 in 2017, the InsuResilience Global Partnership seeks to scale up affordable climate risk insurance solutions for vulnerable populations. The partnership combines donor funding with private sector investment to enhance resilience, particularly through microinsurance, sovereign risk pools, and parametric insurance mechanisms.

The Loss and Damage Fund (LDF): It was formally established during COP27 in 2022 and became operational at COP28 in 2023. Its primary function is to provide financial assistance to developing countries that are vulnerable to the impacts of climate change and whose needs are not adequately addressed by mitigation or adaptation efforts (UNFCCC, 2023a). The fund is currently hosted by the **World Bank** for a transitional period of four years, and its governance is managed by an independent board (Reuters, 2024).

As of mid-2025, approximately **USD 700 million** has been pledged to the fund, which is substantially lower than the estimated **hundreds of billions of dollars** required annually to address global climate-related losses and damages (Earth.org, 2023). Despite these pledges, actual disbursements remain limited, with only **USD 10–17 million** confirmed as delivered so far. These contributions represent less than 0.2% of the annual estimated loss and damage costs faced by developing nations (Earth.org, 2023). While **Germany, UAE, UK, USA, Japan**, and several EU countries are the early supporters, governance challenges have emerged, especially regarding the World Bank's role as trustee and delays in the disbursement process (Germanwatch, 2024).

As of mid-2025, the LDF has yet to disburse funds for large-scale projects, although some pilot activities and capacity-building initiatives are underway through the **Santiago Network on Loss and Damage** (UNFCCC, 2023b). Developing countries, particularly those in **Sub-Saharan Africa, South Asia**, and **Small Island Developing States (SIDS)**, are expected to be among the first recipients once the fund becomes fully operational.

Early Challenges:

- Inadequate funding relative to actual needs (Earth.org, 2023)
- Ambiguities in governance and access, particularly for **Least Developed Countries (LDCs)** (Germanwatch, 2024)
- Withdrawal of key board members, including the USA, raising concerns about the long-term commitment of donors (The Guardian, 2025)

Despite these challenges, the LDF represents a historic milestone in climate finance, establishing the first formal global mechanism for compensating non-economic losses, including displacement, loss of culture, and biodiversity damage (UNFCCC, 2023a). Many OIC countries, due to their high vulnerability to climate-induced events (e.g., floods in **Pakistan**, droughts in the **Sahel**), are eligible beneficiaries of the fund. However, accessibility, governance, and integration with Islamic finance mechanisms remain under-explored (UNFCCC, 2023).

2.2. Climate Change and Natural Disasters in the OIC Member Countries

OIC countries face a complex array of climate change challenges, including escalating temperatures, severe water scarcity, flooding, and institutional deficiencies. These challenges are further exacerbated by economic fragility, limited administrative capacity, and geographical vulnerabilities. According to the Ecological Threat Report 2023, over half of the 30 countries that are most vulnerable to climate change impacts are Muslim-majority populations, predominantly concentrated in lower middle to low-income categories. As a result, the OIC region remains highly susceptible to climate-induced hazards, such as heatwaves, floods, droughts, and desertification (UNDRR, 2020; OIC, 2022).

Recent climate data show pronounced warming across OIC regions, especially in MENA, South Asia, and Sub-Saharan Africa. From June to August 2023, surface temperature anomalies exceeded +4 °C globally and +2 to +3.5 °C across much of MENA and South Asia (NASA, 2023). The Middle East is warming nearly twice as fast as the global average, with projections of up to +4 °C by 2050 under high-emission scenarios (Fanack Water, 2023).

MENA faces increasing temperature extremes, with more frequent and intense heatwaves altering regional climate patterns (Ntoumos et al., 2020; Tzyrkalli et al., 2024; Varela et al., 2020). These trends threaten public health, energy systems, agriculture, and water security. During the 2024 Hajj, temperatures exceeding 50 °C resulted in unprecedented fatalities (Arab News, 2024; The Guardian, 2024). Simultaneously, prolonged droughts—such as the 2020–2023 Horn of Africa event—have triggered major humanitarian crises in countries like Somalia and Niger (UNICEF, 2022).

Water stress induced by climate change is another critical concern for many OIC countries. Nations such as Tunisia, Morocco, and Egypt are grappling with severe droughts and declining freshwater availability, which undermine agricultural productivity and food security. These challenges are aggravated by irregular rainfall patterns and unsustainable water management practices (IMF, 2022; UNDP, 2023).

On the other hand, increasing in the sea-level is another consequence of global warming. Sea-level rise represents a profound and escalating threat to many coastal and low-lying in the OIC region, particularly countries such as Bangladesh and the Maldives. Historical data indicate that global mean sea levels have risen approximately 0.21 to 0.24 meters since 1880, with the current rate of increase accelerating to approximately 3.9 mm per year due to a combination of ocean thermal expansion and glacial melt (NASA, 2023). The implications of these changes are

especially dire for densely populated and geomorphologically vulnerable regions. For instance, Bangladesh, a deltaic country where over two-thirds of the land lies below five meters above sea level, is projected to lose up to 17% of its land area to permanent inundation by 2050, potentially displacing as many as 20 million people (NRDC, 2023).

In addition to rising temperatures, flooding and related impacts—such as displacement—present urgent challenges across the OIC region. Rainfall variability is intensifying hydrological stress, especially in arid and semi-arid zones. By 2020, OIC countries withdrew 33.5% of their internal renewable water resources, exceeding the UN's 25% water stress threshold (SESRI, 2023). The 2022 floods in Pakistan affected tens of millions and caused an estimated \$40 billion in damage (UNICEF, 2022; UNDRR, 2020), while recurrent flash floods in Yemen and the Gulf region continue to cause severe humanitarian disruption (WMO, 2024).

Combating these adverse effects of climate change and natural disasters will require a conscious effort by Countries through the institutionalization of mitigation mechanisms such as building climate resilience programme which will enable countries to both (i) prepare for and adapt to changes expected as a result of a warmer planet, and (ii) reduce their vulnerability and costs resulting from the impacts of climate change.

2.2.1. DRR Strategies in OIC Member Countries

Regional and international frameworks, notably SFDRR, provide essential guidance for OIC Member Countries to enhance disaster risk governance, early warning systems, and community-centered resilience strategies (UNDRR, 2015). Increasing emphasis on nature-based solutions, such as Somalia's solar-powered dams for drought resilience and water management, exemplifies sustainable adaptation approaches (UNDP, 2023). Nevertheless, a major impediment to effective DRR lies in securing sufficient financial resources amid rising climate-induced disaster frequency and intensity, which disproportionately affect economically vulnerable OIC countries.

Therefore, OIC countries must foster regional cooperation, strengthen disaster governance, and develop innovative, socially responsible financing mechanisms. Prioritizing resilient infrastructure, robust early warning systems, and inclusive climate adaptation policies is critical to sustaining long-term development and improving population well-being. Given the multifaceted vulnerabilities—including economic fragility, institutional limitations, water scarcity, food insecurity, rapid urbanization, and fragile political contexts—OIC nations face significant challenges in implementing proactive DRR strategies (UNDRR, 2020; World Bank, 2020; OIC, 2022). Urban areas, often situated in hazard-prone zones, remain particularly exposed due to insufficient resilience measures.

In response, OIC Member Countries have increasingly aligned their DRR strategies with international frameworks such as the SFDRR and Sustainable Development Goals (SDGs), emphasizing integrated risk management, cross-sector collaboration, and inclusive governance (UNDRR, 2015; UN, 2015). These alignments reflect a growing commitment to reducing vulnerabilities, fostering resilience, and ensuring sustainable socio-economic development across the OIC region. The following outlines the principal DRR strategies implemented by OIC countries in accordance with the Sendai Framework's priorities:

Integrated Disaster Risk Governance

Several OIC Member Countries are actively advancing national DRR policies by strategically incorporating disaster risk management into broader development agendas. This integrated approach ensures that DRR is not treated as an isolated issue, but is embedded across key

sectors such as urban planning, infrastructure development, and environmental management (OIC, 2022).

For instance, Turkey and Indonesia have made notable progress by implementing multi-hazard early warning systems alongside comprehensive DRR governance frameworks. These frameworks facilitate coordinated actions across government agencies and emphasize the active involvement of local communities (UNDRR, 2020; OIC, 2022). Azerbaijan has similarly strengthened its DRR governance through the creation of the National Disaster Risk Reduction Council, which coordinates efforts among various ministries to incorporate disaster resilience into national development plans (UNDRR, 2020). In Morocco, climate adaptation strategies have been embedded within urban planning policies, particularly in flood-prone areas, and are complemented by community-based disaster preparedness programs (World Bank, 2020). Qatar has focused on enhancing institutional coordination and investing in resilient infrastructure, aligning risk assessments with its national development vision (OIC, 2022). Nigeria, grappling with diverse hazards such as floods and droughts, has sought to decentralize disaster management through the National Emergency Management Agency (NEMA), which promotes the involvement of state and local governments in DRR activities (UNDRR, 2020).

Early Warning Systems and Technological Innovation

The implementation of early warning systems (EWS) has become a critical component of DRR strategies in many OIC Member Countries. These systems integrate meteorological, hydrological, and geological data, leveraging advanced communication technologies to issue timely alerts that enable governments, local authorities, and vulnerable communities to prepare for and respond to disasters effectively (UNDRR, 2020; OIC, 2022). Given the OIC region's heightened exposure to a variety of climate-related hazards—including floods, droughts, and cyclones—EWS play a pivotal role in mitigating the adverse impacts of these disasters and reducing associated human and economic losses (OIC, 2022).

The effectiveness of early warning systems, however, depends not only on technological capacity but also on the inclusivity of communication strategies. It is essential that EWS reach marginalized populations, including women, children, persons with disabilities, and other vulnerable groups (UN, 2015). For instance, Turkey's Disaster and Emergency Management Authority (AFAD) exemplifies an integrated approach to EWS by combining seismic, flood, and meteorological data with community engagement efforts to enhance preparedness and resilience at the local level (OIC, 2022). Similarly, Malaysia's multi-layered flood warning system, which utilizes remote sensing, mobile alerts, and community outreach, demonstrates the country's commitment to ensuring that warnings are quickly disseminated and tailored to local needs (World Bank, 2020).

In Indonesia, the National Agency for Disaster Management (BNPB) exemplifies effective integration by involving local volunteers and digital platforms to facilitate the dissemination of early warnings, particularly in high-risk regions like Aceh and Sulawesi (World Bank, 2020). Morocco's approach to EWS is notable for embedding these systems within local governance structures and fostering public-private partnerships to enable swift communication during flooding events, especially in urban centers like Casablanca (World Bank, 2020). Likewise, Nigeria's National Emergency Management Agency (NEMA) has enhanced its community-based EWS initiatives by collaborating with local governments to improve outreach, particularly in flood- and drought-prone areas, while emphasizing inclusivity in its communication strategies (UNDRR, 2020).

Community-Based and People-Centred Approaches

Participatory approaches emphasizing the participation of marginalized groups, such as women, children, persons with disabilities, and displaced populations who face heightened risks have become essential in enhancing community resilience to climate-induced hazards, particularly in vulnerable regions. These approaches prioritize local engagement throughout disaster preparedness, response, and recovery, enabling communities to assess risks, design context-specific interventions, and reinforce social cohesion (Kelman, 2020; Shaw et al., 2019). Capacity-building efforts—including disaster risk education, awareness campaigns, and training of local emergency teams—are crucial for strengthening adaptive capacity and reducing vulnerabilities (UNDRR, 2015). The following are some examples from OIC Member Countries that have adopted community-based approaches to disaster risk reduction (DRR), emphasizing local engagement and inclusivity (OIC, 2022):

- **Morocco:** CBDRM programs in flood-prone Souss-Massa utilize local knowledge to enhance early warning and evacuation, focusing on vulnerable groups like rural women and children.
- **Indonesia:** The BNPB trains local volunteers in high-risk areas (Aceh, Sulawesi) to boost earthquake and tsunami preparedness.
- **Qatar:** Participatory DRR strategies involve community leaders and civil society in campaigns addressing urban flood and heatwave risks.
- **Azerbaijan:** Local committees monitor landslides and floods, promoting community ownership and rapid hazard response.
- **Turkey:** AFAD implements gender-sensitive, community-focused DRR programs, especially in earthquake-prone regions, with strong municipal-level training.
- **Pakistan:** NDMA engages communities in flood-prone Sindh and Punjab through education and volunteer networks, empowering vulnerable populations.

These examples highlight the effectiveness of grassroots involvement in building resilience and ensuring inclusive disaster preparedness in OIC Member Countries.

Climate Adaptation And Ecosystem-Based DRR

Many OIC Member Countries are increasingly embracing ecosystem-based approaches to disaster risk reduction (Eco-DRR), recognizing the crucial role of natural ecosystems—such as wetlands, mangroves, and forests—in mitigating the impacts of natural hazards (UNDP, 2023; OIC, 2022). In countries like Senegal and Indonesia, the integration of climate adaptation strategies within DRR frameworks has supported sustainable water resource management while mitigating risks associated with sea-level rise and flooding (UNDP, 2023). In addition, Urban Forests (Kent Ormanları) in Türkiye are central to green infrastructure, aiding stormwater absorption, air purification, and heat mitigation in cities like Istanbul, İzmir, and Antalya. The Kızılırmak Delta exemplifies ecosystem-based management through flood control, dune restoration, and sustainable agriculture. Additionally, the \$400 million Climate Resilient Forests Project enhances wildfire management and forest-based disaster mitigation. Furthermore, The National Environment Strategy in Qatar prioritizes wetland and mangrove conservation for coastal protection, biodiversity, and carbon sequestration. Initiatives like the Al Dhakira Mangrove Restoration Program and Ambassadors of Environment campaign promote ecosystem rehabilitation and public awareness. Finally, Indonesia, Malaysia, and Pakistan are implementing ecosystem-based adaptation (EbA) strategies aligned with climate

adaptation and ecosystem-based DRR guidelines. Efforts include mangrove reforestation, agroforestry for slope stabilization, and integrated watershed management to combat floods, erosion, and climate hazards. These initiatives reflect a growing commitment to nature-based solutions for climate adaptation across the OIC region.

2.2.2. Remaining Gaps, Contextual Challenges and Opportunities in the OIC Countries for DRR

Despite significant progress in DRR frameworks across many OIC Member Countries, substantial gaps continue to impede the effective management of disaster risks. One of the most prominent challenges is institutional fragmentation, which is widespread in several OIC countries. This fragmentation is characterized by overlapping mandates and a lack of coordination among governmental agencies, which undermines the cohesive implementation of DRR policies. Such fragmentation often leads to both the duplication of efforts and the failure to address critical disaster vulnerabilities, particularly in countries with decentralized governance structures (UNDRR, 2020).

Another significant barrier to effective DRR is the insufficient availability of disaster-related data, which hinders accurate risk assessments and evidence-based decision-making. Many OIC countries face limitations in data collection and management due to weak national statistical capacities, limited use of geospatial technologies, and inconsistent data-sharing practices across sectors and borders. As a result, early warning systems and risk mapping remain suboptimal, leaving populations more vulnerable to disasters (World Bank, 2021).

In addition to data limitations, technical and human resource constraints further exacerbate these challenges. The scarcity of specialized expertise in fields such as hazard modeling, climate adaptation, and community-based DRR impedes the capacity of national agencies to design and implement context-specific interventions. Moreover, the lack of sustained investment in capacity-building programs hampers local-level preparedness and resilience, which are crucial for addressing the needs of predominantly rural and peri-urban populations across many OIC states (Baker Institute, 2023).

Financial constraints also pose a significant challenge to the long-term sustainability of DRR efforts. Many OIC countries face competing development priorities within constrained fiscal environments, leading to underfunded DRR initiatives. Dependence on external donor funding exposes countries to shifting international agendas and results in short-term project cycles that fail to institutionalize resilience-building. The underutilization of innovative financing mechanisms, such as catastrophe bonds, risk pooling, and climate funds, further limits the potential for long-term sustainability (UNDP, 2022).

Political instability and governance challenges present additional hurdles to effective DRR. Several OIC Member Countries face issues, weak rule of law, or transitional political phases that disrupt the continuity of DRR policies and the enforcement of regulatory frameworks. These conditions also hinder the integration of DRR into broader national development plans and undermine community trust and engagement—two crucial components for successful participatory risk reduction (Baker Institute, 2023).

Despite these challenges, regional cooperation within the OIC has emerged as a promising avenue to address these gaps. Initiatives such as the OIC Disaster Risk Reduction Forum facilitate knowledge sharing, capacity-building, and the harmonization of policies across member countries. However, the effectiveness of these regional mechanisms is sometimes

constrained by unequal resource distribution, differing national priorities, and varying institutional capacities among member countries (OIC, 2022).

To bridge these gaps, OIC countries must further integrate DRR into their national development agendas, emphasizing multisectoral coordination and strengthening governance frameworks. Key steps include prioritizing investments in data infrastructure, fostering technical expertise through education and training, and exploring innovative financing models. Furthermore, scaling up community-based and ecosystem-based adaptation strategies will enhance resilience at the grassroots level, where disaster impacts are most acute.

In conclusion, even though OIC countries have advanced in DRR through improved governance, early warning systems, and community engagement, nevertheless, weak governance, limited insurance, and funding shortages still impede recovery in many OIC countries (Mohammed & Khan, 2024). Therefore, strengthening institutions, enhancing regional cooperation, and securing sustainable investment, particularly via Islamic finance's ethical risk-sharing models, are critical to addressing climate-driven risks (UNDRR, 2020; Baker Institute, 2023; OIC, 2022). At this point, faith-based networks and Islamic charitable organizations and Islamic finance instruments like Zakah, Takaful, Green Sukuk, Waqf, and Qard Hasan may provide essential funding for disaster relief, recovery, and ethical resource management (Kahf, 2018; Rosly & Zulkifli, 2019; Mohammed & Khan, 2024).

2.3. Islamic Finance and Climate Risk & Natural Disasters Financing Opportunities

The values underpinning the fundamental principles of Islamic Finance make it a natural fit to a sustainable action against climate change and natural disasters as it promotes financing that is socially responsible and environmentally friendly, and this perhaps may explain why the Islamic Development Bank (IsDB) has taken a center stage on climate change and natural disasters by coming up with a 5-year, 2020–2025 Climate Action Plan, in 2020, with the overarching goal of deepening sustainable development imperatives for a better and safer planet.

From an Islamic finance perspective, green finance referring allocation of financial resources to projects that contribute to environmental sustainability is also closely aligned with core ethical and social principles. The principles of *Maqasid al-Shariah* reinforce the alignment between green finance and the SDGs. These principles emphasize balance (*mizan*), intergenerational justice (*'adalah*), and stewardship (*khalifah*), all of which are consistent with the goals of environmental sustainability and inclusive development (CIBAFI, 2022). Thus, green finance, when embedded within Shariah-compliant frameworks, becomes both a vehicle for SDG delivery and an expression of Islamic ethical values. Islamic financial instruments such as green sukuk offer a practical avenue to mobilize capital for sustainable development, especially when supported by appropriate regulatory frameworks and institutional cooperation.

In Islamic finance, *Maqasid al-Shari'ah* is interpreted as a means of achieving both individual and societal welfare, emphasizing long-term social and environmental benefits over short-term financial gains. This approach aligns financial practices with ethical imperatives, promoting human flourishing and the overall good of society. It goes beyond the traditional corporate social responsibility (CSR) model, positioning societal and environmental welfare as essential outcomes of financial activity (Asutay, 2007; Chapra, 2000).

Given its inherent sustainability and alignment with green finance principles, Islamic finance holds significant potential for financing climate change mitigation and disaster risk reduction.

Accordingly, the following section analyzes key Islamic finance instruments relevant to DRR and climate change funding.

Disaster risk finance instruments fall into two categories: ex-ante (pre-disaster) and ex-post (post-disaster). Ex-ante instruments are arranged beforehand, enabling fast access to funds for preparedness activities like risk assessment, infrastructure strengthening, and early warning systems. Ex-post instruments provide funding after disasters but often face delays and unfavorable terms. Prioritizing ex-ante financing helps governments reduce dependence on post-disaster aid and improve resilience. Both approaches are essential for effective disaster risk management (UNCDF, 2025). Considering these categories, there are various Shari'ah-compliant financial instruments that are used to mitigate climate risk and support disaster resilience. These Islamic financial instruments can also be categorized into pre-disaster ex-ante (risk reduction) instruments and post-disaster ex-post (risk transfer) instruments. These instruments may include: green Sukuk, Takaful, Islamic social finance (Zakah, Sadaqah and Waqf), Islamic Crowdfund, conditional financing, guarantees (rahn or kafala), parametric takaful, and catastrophe bond. These instruments are briefly discussed as follows:

2.3.1. Major Islamic Financial Instruments for DRR and Climate Change Financing

Islamic financial instruments such as *Green Sukuk*, *Zakah*, *Takaful*, and *Waqf* are increasingly being used to address climate change and implement DRR strategies, particularly in vulnerable communities. These instruments are not only ethically grounded but are also aligned with the principles of sustainability, social justice, and risk-sharing, which are essential for long-term resilience (El-Halwagi, 2017; Bakar & Mokhtar, 2023; Mohammed & Khan, 2024). The following are major Islamic finance instruments currently used, and with strong potential to be further utilized, for disaster risk reduction (DRR) and climate change funding.

Green Sukuk

Green Sukuk, or Shari'ah-compliant bonds, serve as innovative financial instruments dedicated to funding environmentally sustainable infrastructure projects. These projects include renewable energy, climate-resilient systems, and disaster mitigation strategies. Green Sukuk have been particularly instrumental in mobilizing both public and private sector capital to address climate adaptation and disaster resilience in OIC countries (Mohammed & Khan, 2024). Accordingly, these instruments support the transition to a low-carbon economy by reducing reliance on fossil fuels, promoting clean energy, and enabling eco-friendly construction. They also fund climate adaptation projects including water management, flood control, coastal protection, reforestation, and sustainable agriculture, thereby enhancing resilience and food security (Rahman et al., 2023).

Structurally different from conventional bonds, Green Sukuk generate returns from asset-backed profits rather than interest, making them well-suited for ethical and environmentally focused investments (Naseri, 2024; Saeed, 2021). Their growing role in climate finance is evident in successful issuances such as Malaysia's debut in 2017, Indonesia's \$1.25 billion sovereign issuance in 2018, and the Islamic Development Bank's €1 billion issuance in 2019 (ADB, 2025). As of April 2025, at least 14 major Green Sukuk issuances linked to climate action have been recorded, totaling over \$11.859 billion and €1 billion, although the actual figures may be higher due to data limitations (ADB; IsDB, 2025).

In addition to green sukuk, Islamic Social Impact Bonds are emerging instruments combine the principles of Sukuk with social impact objectives, potentially attracting private investments

to fund disaster resilience programs, while ensuring predefined social outcomes (Karim et al., 2021).

Islamic Crowdfunding Platforms

Islamic crowdfunding platforms can be established to galvanize funds for climate related initiatives. These platforms enable individuals and organizations to contribute to specific climate projects, fostering a collective approach towards combating climate change. This concept was popularized by IsDB in 2019 when it approved financing of 1 million euros to Greenlight Planet through TRINE, a crowdfunding platform based in Sweden solely specialized in the off-grid solar sector and actively operating in Sub-Saharan Africa and recently in South Asia.

Box I: Conditional Financing and Guarantees

Similar to conditional loans in the conventional banking space as proposed by Allendorf (2025), Islamic banks can also offer conditional financings as financial instruments. The financings are usually provided at market-based or concessional rates to companies, households or other institutions. Concessional financings, can be made conditional on their use for specific purposes, such as climate- and disaster-risk reduction measures, or on taking resilience considerations into account in project finance. For instance, development banks may provide a credit facility that local commercial banks or microfinance institutions (MFIs) can draw on for on-lending to the private sector or individuals to implement risk-reducing, resilience enhancing, environmental projects or climate related projects in a Shari'ah compliant manner.

On the other hand, financial guarantees are contractual obligations under which a third party, such as a government entity, agrees to repay a borrower's debt to a lender should the borrower default. The aim of this product is to de-risk the green projects and to crowd in the private sector investors. Governments or donors might introduce a guarantee scheme to catalyze investment in climate- and disaster risk-reducing measures, climate-smart equipment or resilient infrastructure. The investors might be local governments, business or private households who would otherwise not have the funding capacity to undertake these activities and/or not be sufficiently creditworthy (Allendorf (2025)). This product is also applicable in the Islamic finance space.

Takaful and Re-tekaful

Takaful is a Shari'ah-compliant alternative to conventional insurance, emphasizing mutual, ethics-focused risk-sharing practices. It differentiates itself from traditional insurance by avoiding elements such as interest (Riba), excessive uncertainty (Gharar), and speculation (Maysir), which are prohibited under Islamic law. Takaful is a mutual assistance mechanism that is based on solidary (ta'awun) and voluntary contribution (tabarru'i), where participants contribute to a pool of funds to support members facing loss or damage due to climate-related events. Under Takaful, the risk-sharing mechanism ensures that the financial burden of natural disasters is collectively borne, promoting community resilience. Takaful complements climate finance to protect against risks by providing an alternative to conventional insurance.

The IsDB further reports that Insurance coverage was below 1% in the 10 largest Countries with sizeable Muslim populations and the 200 natural disasters that occurred in the OIC countries between 2021 and 2022 resulted in a loss of approximately \$23 billion out of which only \$300

million was insured. This clearly indicates Takaful opportunities. Additionally, the Takaful market growth rate was 11.61% in 2022 and it is projected to reach \$72 billion by premium volume by 2030. Takaful represents only 1% of the total Islamic Finance assets which was \$3.25 trillion as at 2022.

As for retakaful, which is Islamic reinsurance, it supports Takaful operators by spreading risks across larger pools, thus ensuring financial stability and enhancing the overall capacity to respond to large-scale disasters (Khan et al., 2020; Rosly & Zulkifli, 2019). Additionally, parametric insurance solutions designed for natural hazards have emerged, improving financial protection and resilience.

This risk-sharing model enhances community-based preparedness and provides a sustainable solution for disaster resilience.

Box II: Parametric Takaful

Islamic financial institutions are developing innovative disaster risk financing products, such as parametric takaful, to provide timely funding for disaster response and recovery. This instrument offers quick liquidity to affected regions, enhancing disaster resilience. Parametric or indexed-based takaful is a type of Shari'ah compliant insurance in which a payout is automatically triggered when certain predefined parameters (e.g., duration of a dry period, amount of precipitation, wind speed) are reached or exceeded. Some categories of parametric takaful include: Climate Index Takaful (CIF), Area Yield Index Takaful (AYIT), Livestock Index Takaful and Flood Index Takaful (UNDCF (2025).

According to UNCDF (2025), takaful-based climate risk and parametric takaful are emerging as Shari'ah-compliant alternatives in Muslim-majority countries, where conventional insurance is prohibited. There are success stories around the globe on the use of these takaful products to mitigate climate related natural disasters. In the Maldives, a Takaful-based natural disaster insurance program protects vulnerable coastal communities from cyclones and rising sea levels. Designed in collaboration with the government, local Takaful operators, and the World Bank, it provides rapid payouts based on parametric triggers, such as wind speed or rainfall levels (World Bank, 2020). Indonesia has introduced Takaful-based crop insurance to safeguard smallholder farmers from floods, droughts, and storms. Using weather-indexed parametric models, payouts are triggered automatically when predefined climate thresholds are met, ensuring faster financial relief (Takaful Indonesia, 2020). In Pakistan, Takaful flood insurance supports communities frequently affected by floods. Parametric triggers linked to rainfall indices and flood markers enable swift compensation, helping affected families rebuild quickly. The program is expanding through government and private sector partnerships with local Takaful operators (Pakistan Insurance Association, 2019).

The above-mentioned Takaful case examples highlight the potential of Takaful in enhancing climate resilience with context-specific, Shari'ah-compliant risk solutions.

Islamic Social Finance (Infaq) Instruments

All Islamic social finance instruments can be encompassed by the Qur'anic concept of *Infaq*, which functions as an umbrella term for charitable and solidarity-based institutions in Islam—such as *zakah* (obligatory almsgiving), *sadaqah* (voluntary charity), and *waqf* (endowments). Broadly speaking, *Infaq* refers to all forms of spending from one's wealth, including both in-kind

and cash assistance, directed toward those in need for the sake of Allah (*fi sabilillah*) (Tekin, 2021).

Accordingly, given the central role of infaq instruments in promoting socio-economic welfare, these institutions possess substantial potential to contribute to the mobilization of financial resources for climate resilience and disaster risk reduction initiatives. By aligning their objectives with sustainable development goals, such institutions can serve as pivotal actors in fostering community-based adaptation and enhancing societal preparedness against environmental hazards.

For instance, as the obligatory almsgiving in Islam, Zakah has a potential to be a key component in disaster relief and resilience building. Funds from Zakah can be directed toward immediate disaster response, long-term recovery, and community-based resilience initiatives. Zakah funds are often managed by state or semi-official bodies and can be allocated for activities such as flood defense construction or emergency response systems (Sadeq, 2015). In addition, **sadaqah**, which represents voluntary charitable giving, complements Zakah by funding local preparedness programs and public awareness campaigns that mitigate disaster risks (Hasan & Dridi, 2010).

The Islamic Development Bank estimates the global value of Zakah to be between \$232 billion and \$560 billion annually, and this presents huge opportunity for financing climate change related projects and natural disasters. For example, in Indonesia, Zakah has been used to fund renewable energy projects in rural areas. The country's national Zakah collection agency, BAZNAS, used approximately \$350,000 to finance the building of a power plant in the province of Jambi, to help to provide much-needed electricity for residents in deprived villages. Similarly, the International Federation of the Red Cross and Red Crescent Societies (IFRC) used Zakah collected in the Malaysian state of Perlis to fund a drought assistance programme in the Kenyan county of Kitui, pioneering a sustainable humanitarian Zakah initiative. The objective of the programme was to assist communities affected by climate change-induced drought in southern Kenya and in total, \$1.2 million in Zakah funding was channeled to Kitui county.

Sadaqah, unlike zakah, is purely voluntary and is an act of Ihsan which attracts tremendous reward. Sadaqah can be institutionalized and employed to finance environmental conservation projects such as reforestation, preserving wildlife, and safeguarding natural habitats. The funds raised through Sadaqah can be channeled towards organizations and programs focused on environmental projects ((Yandri et al. (2023), Hosen (2023)).

In addition to zakah and sadaqah, waqf, or philanthropic endowments, is another instrument within Islamic finance that can be revitalized to fund sustainable development and post-disaster recovery. These endowments create long-term financial reserves, reducing reliance on external aid while ensuring continuity of community-based resilience programs (El-Halwagi, 2017). It generates income which can be used to support various causes, which may include financing sustainable development projects, such as installing renewable energy sources, constructing energy-efficient buildings, and establishing climate-resilient infrastructure in communities (Listiana, 2022). Moreover, Qard Hasan, which means interest-free loan provided for benevolent purposes can also be utilized to support climate-resilient entrepreneurship initiatives, giving entrepreneurs the necessary capital to develop and implement environmentally sustainable business models (Hosen (2023)).

Thus, Islamic Social Finance Instruments can be employed to empower communities in vulnerable regions to adapt to climate impacts by using the instruments to raise funds to finance climate-resilient housing, community-based disaster preparedness programs, and sustainable

livelihood initiatives; and by harnessing Islamic Social Finance Instruments, communities, and organizations can mobilize resources in a Sharia-compliant manner to address climate change (Shahid et al. (2023), Hosen (2023)).

Islamic Microfinance Institutions

Shari'ah-compliant microfinance schemes offer financial services to low-income households and micro-entrepreneurs, helping them rebuild livelihoods after disasters and promoting financial inclusion (Khan et al., 2020). Islamic microfinance institutions have the capacity to offer microfinance products tailored to bolster climate-resilient livelihoods (Shahid et al., 2023). These funds can be employed by individuals and small businesses to engage in climate-smart agriculture, renewable energy ventures, and other sustainable livelihood activities. Islamic charitable foundations and trusts can extend grants for climate-related projects and initiatives. These grants can be directed toward organizations and programs focused on climate change adaptation, mitigation, and community resilience.

Box III: Public-Private Partnerships (PPPs)

The Public-Private Partnerships (PPPs) is another major financing opportunity where governments, private sector, and financial institutions collaborate to finance climate-resilient infrastructure and it also encourages investment in disaster-proof housing, roads, and energy systems. The PPPs in climate finance have a range of application potential. Mitigation has attracted substantial public-private climate finance, but adaptation is also in scope, provided that challenges such as profitability or risk-management can be overcome. This is supported by a research conducted by OECD/CPI where it found that 77% of climate finance went to mitigation, 16% on adaptation and test activities (Gardiner, A. et al (2016)). Accordingly, Sahirah-compliant PPP models have vast potential in terms of DRR and climate change financing in OIC countries.

In conclusion, Islamic finance presents a comprehensive and ethically grounded approach to addressing climate change and advancing DRR in vulnerable communities. By leveraging instruments like Green Sukuk, Zakah, Takaful, and Waqf, OIC countries can mobilize financial resources for disaster preparedness, response, and recovery while fostering social welfare and resilience. These instruments align with the values of sustainability, risk-sharing, and social justice, offering a unique opportunity to strengthen climate resilience and reduce disaster risks in the face of increasing environmental challenges (Ahmad & Haron, 2020; El-Halwagi, 2017; Bakar & Mokhtar, 2023).

2.4. Islamic Finance and Conventional Green Finance: A Comparative Analysis for DRR Strategies

Both **Islamic financial tools** and **conventional green finance** offer valuable contributions to **DRR**. However, Islamic finance distinguishes itself through its ethical, risk-sharing, and asset-backed principles that align closely with the goals of resilience building and equitable disaster risk distribution (Iqbal & Mirakhor, 2011).

As mentioned above, since Islamic finance operates under the framework of *Shari'ah* law, which prohibits interest (*riba*) and emphasizes the principles of **risk-sharing**, **social justice**, and **ethical investments** (Usmani, 2002), Islamic financial tools such as **sukuk**, **takaful**, and **qard hasan** are designed to promote **sustainability**, **social welfare**, and **community engagement** in disaster risk management (El-Gamal, 2006; Dusuki, 2011).

These instruments provide innovative financing solutions for DRR by ensuring that resources are mobilized for the benefit of communities and that risks are equitably shared, rather than transferred to external parties as is common in conventional finance (Khan & Bhatti, 2008).

On the other hand, conventional green finance includes instruments such as **green bonds**, **green loans**, and **grants**, which are primarily used to fund environmental sustainability initiatives such as renewable energy, water conservation, and infrastructure projects that mitigate climate risks (World Bank, 2020). While effective in financing environmental projects, conventional green finance lacks the community-centric, ethical framework that is central to Islamic finance, often focusing on financial returns and risk transfer rather than community resilience and social justice (Khan & Bhatti, 2008).

2.4.1. Comparative Advantages of Islamic Finance in DRR and Climate Finance

Both Islamic and conventional finance are increasingly stepping up to support sustainable or green investments. While they converge on a shared objective, their approaches are shaped by differing foundational principles, operational practices, and performance outcomes. A comparative analysis of their respective roles in advancing sustainability and managing risk offers meaningful insights for policymakers and financial stakeholders alike.

Islamic finance offers several advantages over conventional green finance in the context of DRR:

1. **Risk Sharing vs. Risk Transfer:** Islamic finance promotes **risk-sharing**, aligning directly with DRR's goal of distributing disaster risks equitably across communities (Iqbal & Mirakhor, 2011). In contrast, conventional finance often **transfers risks** to external insurers or lenders, which can limit **community involvement** in disaster resilience. Risk-sharing fosters a sense of collective responsibility and encourages sustainable and community-driven solutions.
2. **Asset-Backed Financing:** Islamic finance requires that financial transactions be **backed by tangible assets** such as infrastructure or natural resources. This ensures that investments are directed toward **real economic activities** that can enhance physical infrastructure, such as flood defenses or disaster-resistant buildings (El-Gamal, 2006). This asset-backed nature provides **long-term security** and tangible benefits for disaster resilience. Conventional green finance, while also focused on environmental sustainability, may not always prioritize asset-backed structures, which could limit the effectiveness of investments in building resilient infrastructure.
3. **Ethical and Social Impact Focus:** One of the key features of Islamic finance is its focus on **social justice** and **ethical investment**. Islamic finance mandates that investments be directed toward projects that benefit society and prohibits investments in activities harmful to the environment or social welfare (Usmani, 2002). In DRR, this ensures that projects not only address environmental challenges but also contribute to broader **social objectives** such as poverty alleviation, social equity, and **community well-being**. In contrast, conventional finance may prioritize **profit maximization** over the societal impact of projects.
4. **Flexibility and Community Support:** Instruments such as **qard hasan** provide **interest-free loans** to vulnerable populations for **recovery** and **resilience-building efforts**, enabling them to recover from disasters without the financial burden of debt (Dusuki, 2011). This flexibility and community-centered approach are often missing in conventional green finance, where loans or grants may come with repayment conditions that could place financial strain on affected populations.

5. **Sukuk for Infrastructure:** **Sukuk**, the Islamic equivalent of bonds, can be used to **mobilize long-term capital** for infrastructure projects that are crucial to reducing disaster vulnerabilities. Sukuk are especially useful for financing **climate-resilient infrastructure**, such as flood barriers, resilient housing, and renewable energy systems, which are essential for disaster risk reduction (Iqbal & Mirakhor, 2011). Sukuk-based financing ensures that the capital raised is directly linked to tangible and sustainable assets, offering long-term solutions to climate risks.
6. **Inherent Sustainability:** Islamic finance is inherently **sustainable** because it aligns financial activities with **ethical principles** and emphasizes investments that promote **environmental protection** and **social justice**. It mandates investments in **eco-friendly projects**, such as **renewable energy** and **sustainable infrastructure**, while avoiding industries that harm the environment (e.g., fossil fuels). In comparison, conventional green finance, although focused on sustainability, may still allow for investments in sectors that could conflict with long-term environmental or social goals.

Table 5: Comparative Advantages of Islamic Financial Tools over Conventional Green Finance on DRR Strategies

Feature	Islamic Financial Tools	Conventional Green Finance
Risk Approach	Risk-sharing among parties (e.g., Sukuk, Takaful)	Risk transfer to third parties (insurance)
Asset-Backed Financing	Requires tangible asset backing (Sukuk)	May finance intangible or high-risk assets
Ethical & Social Focus	Strong emphasis on social justice and ethics	Primarily environmental focus
Community Engagement	Supports vulnerable groups via Qard Hasan	Limited direct support for communities
Long-Term Infrastructure Finance	Facilitates resilient infrastructure through Sukuk	Green bonds support sustainable projects but may lack risk-sharing
Sustainability	Sustainable by definition.	Conventional finance may contribute to unsustainability by prioritizing short-term profits over long-term social and environmental impacts.

Source: Prepared by authors depending on the studies by Dusuki, A. W. (2011); El-Gamal, M. A. (2006); Iqbal, Z., & Mirakhor, A. (2011); Khan, F., & Bhatti, M. I. (2008); Usmani, M. T. (2002); World Bank. (2020).

In conclusion, while both Islamic finance and conventional green finance contribute to disaster risk reduction, **Islamic finance** offers a unique and **ethical framework** that aligns more closely with the goals of **community resilience**, **risk-sharing**, and **sustainable development**. By prioritizing **social justice**, **ethical investment**, and **asset-backed financing**, Islamic finance instruments like Sukuk, Takaful, and Qard Hasan provide multifaceted solutions for addressing climate risks and enhancing disaster resilience in vulnerable communities. These instruments not only support environmental sustainability but also contribute to the **social welfare** and **economic recovery** of affected populations, positioning Islamic finance as a valuable tool for **long-term disaster risk reduction** in the context of a **changing climate**.

2.4.2. Challenges, Opportunities, and Policy Recommendations to Way Forward to Advance Islamic Finance on DRR Strategies in OIC Countries

Despite the vast potential, Islamic finance's role in DRR faces challenges such as fragmented regulatory frameworks, limited public awareness, and insufficient technical capacity within OIC countries (Usmani, 2017). Coordination gaps between disaster management agencies and Islamic financial institutions further impede integrated approaches to risk financing.

Key Challenges

- **Regulatory Gaps and Policy Uncertainty:** Many OIC jurisdictions still lack clear frameworks for green Islamic products. Regulations on green sukuk remain nascent, and dual requirements, from financial regulators and Shariah boards, can slow down product approval due to more complexity, extending the time and costs. Without incentives like lower capital requirements or mandatory climate risk disclosures, Islamic banks may hesitate to scale green offerings.
- **Limited Market Awareness and Capacity:** Green Islamic finance is a new concept for many investors, customers, and even financial professionals within OIC countries. Market awareness is limited, many potential issuers may not know that they could raise funds via green sukuk or may not be familiar with the benefits of doing so, such as access to a broader investor base or potentially better pricing. Likewise, retail and institutional investors in some regions may be unaware of or unconvinced about green investments, seeing them as niche or carrying lower returns. There is also a lack of professionals trained in both Islamic structuring and environmental project evaluation, hindering pipeline development and due diligence. Capacity constraints complicate this as there are relatively few experts who understand both Islamic finance structuring and environmental project evaluation, hindering pipeline development and due diligence.
- **Limited Bankable Green Projects and Climate Data:** Although climate needs are urgent, many projects in OIC countries lack feasibility studies or reliable climate data. This makes it harder for Islamic banks and investors to assess environmental impact or financial viability, especially without standardized green taxonomies or impact metrics. This ties back to the global challenge of standardization, until common frameworks reach OIC markets, Islamic financial institutions might proceed cautiously.
- **Higher Risk Perceptions and Limited Investor Base:** Green projects are often perceived as carrying higher or unfamiliar risks. Without mechanisms like credit guarantees or insurance (and with Islamic finance's prohibition on certain conventional hedging tools), these risks can be daunting. Islamic financial institutions may lack guarantees or mitigation instruments. Additionally, while the investor base for green sukuk is expanding, it is still developing. Traditionally, Islamic investors might prioritize asset security and Shariah compliance, without specific regard to green criteria. On the other side, some conventional ESG investors might be less familiar with sukuk structures. This mismatch can limit liquidity and uptake for green Islamic issuances initially. However, this is starting to change as more success stories emerge, but overcoming the risk perception remains a task.
- **Shariah Harmonization Issues:** While green objectives generally align with Islamic values, new instruments, such as sustainability-linked sukuk or carbon credits, may face Shariah scrutiny. Divergence in scholar views can delay innovation and consistency in product design. Inconsistency in Shariah rulings across jurisdictions can thus be a minor barrier, achieving consensus on certain complex structures might take time.

Despite these challenges, the outlook for Islamic finance in OIC countries is increasingly optimistic, due to several strong opportunities:

Opportunities

- **Growing Demand for Ethical and Climate-Friendly Investments:** There is a noticeable increase in consciousness about climate change and ethical finance among the populations in some OIC countries, especially the youth and educated demographics. This is translating into demand for investment products that are both Shariah-compliant and sustainable. As surveys indicate, a majority of Muslims place importance on ethical considerations, where over 76% consider religion very important in life, and 66% are willing to pay more for ethical products (OECD, 2020). This is a strong foundation for green Islamic finance development. The ethical branding advantage is a key opportunity to declare Islamic finance adherence to Shariah compliance, but also contribute to broader objectives of environmental protection. This dual appeal can draw in both traditionally minded investors and the environmentally conscious sectors, broadening market reach of Islamic finance.
- **Expansion of Green Sukuk and Innovative Islamic Instruments:** The successful issuances of green sukuk by countries like Indonesia, Malaysia, UAE, Saudi Arabia and institutions, such as IsDB, have shown a leading example. The green sukuk market is expected to continue its strong growth. The opportunity here is for wider adoption: as more issuers enter, secondary market liquidity will improve, and costs of issuance will be reduced supported by standardized practices, such as the new ICMA-IsDB-LSEG guidance. Further innovation can also be expected in development of financing instruments, such as sustainability-linked sukuk and green takaful products, demonstrating the agility of Islamic finance in serving green needs.
- **International Support and Collaboration:** Multilateral institutions and climate funds are increasingly collaborating with Islamic finance actors. Partnerships with the Green Climate Fund or development banks can blend concessional finance with sukuk to de-risk investments. Regional platforms such as COMCEC and IsDB are also facilitating capacity building and peer learning from each countries' experience, building synergy in advancing green Islamic finance development.
- **Alignment with Global Standards and Investor Attraction:** As global investors increase their ESG allocations, many are looking for diversification and new markets. Green sukuk offer both: exposure to high-growth emerging economies and compliance with rigorous green standards. The fact that global frameworks have been shown to be fully compatible with sukuk (such as the ICMA-IsDB-LSEG Guidance on Green, Social and Sustainability Sukuk) gives confidence to international investors that green sukuk are as credible as green bonds. Adopting global disclosure standards can help OIC markets access funding from ESG-focused institutions worldwide, broadening the Islamic finance investor base beyond the traditional pool, and unlocking new sources of funding.
- **Addressing Climate Risks through Islamic Finance Innovation:** For many OIC countries that are highly vulnerable to climate change, Islamic finance offers practical tools to help manage and reduce those risks, especially where conventional finance may not be well-suited. One strong example is disaster relief. Through Islamic finance's risk-sharing principles, countries could create a pooled sukuk fund that provides quick funding after natural disasters like floods or earthquakes. This funding could be repaid gradually through a mix of government resources and Islamic charitable funds, making it both Shariah-compliant and socially responsible. Other innovative instruments, such as catastrophe

sukuk, waqf-based climate funds, and blended green finance using Islamic social instruments can help financing for projects that protect communities, such as flood risk management, or drought-tolerant crops investment. These public goods do not always attract private investment, but are essential for long-term resilience. Looking ahead, Islamic finance could help OIC countries design Shariah-compliant instruments similar to catastrophe bonds, which provide financial protection against extreme weather events. Islamic finance can do more than just fund green projects, it can offer tailored, ethical solutions for the climate challenges many OIC countries face. With the right support and innovation, it could become a key pillar in building climate resilience across the region.

Accordingly, the future of green Islamic finance in OIC countries holds significant opportunities. While challenges remain, they are being actively addressed through improved regulations, capacity building, and pioneering transactions that are helping to build market confidence. The inherent alignment between Islamic finance and sustainability offers a solid foundation for OIC countries to build upon. By seizing emerging opportunities, such as rising ethical demand, product innovation, global partnerships, and targeted climate finance, OIC nations can meaningfully strengthen the role of Islamic finance in advancing green projects and addressing climate risks. This will not only support global climate action, but also help ensure that financial systems in OIC countries evolve in ways that promote long-term, inclusive, and climate-resilient development for their populations.

Table 6: Islamic Financial Instruments Aligned with DRR Strategies

Islamic Financial Instrument	Preparedness (Risk Awareness, Early Warning)	Resilience (Infrastructure, Risk Transfer)	Response (Emergency Relief, Compensation)	Recovery (Rehabilitation, Rebuilding)
Zakat	✓ Support disaster education & awareness programs for the poor	✓ Strengthen livelihoods of vulnerable groups	✓ Fund immediate humanitarian needs	✓ Provide cash assistance to rebuild lives
Infaq/Sadaqah	✓ Community awareness campaigns	✓ Build community infrastructure (e.g., water, sanitation)	✓ Emergency food/health supplies	✓ Short-term cash transfers or housing
Waqf	✓ Fund research centers or early warning systems	✓ Invest in DRR-related infrastructure (e.g., hospitals, dams)	✗ (Limited role in immediate response)	✓ Long-term support for reconstruction and social services
Takaful	✗ (Not typically used at this stage)	✓ Pre-disaster risk pooling and protection for assets	✓ Provides payouts for insured damages	✓ Financial stability for insured recovery needs
Retakaful	✗	✓ Strengthens financial resilience of Takaful operators	✓ Enables large-scale claim payouts	✓ Ensures sustainability of insurance system
Green Sukuk	✓ Fund climate-smart DRR infrastructure	✓ Finance flood barriers, drought-resistant systems	✗ (Not designed for short-term relief)	✓ Fund rebuilding of sustainable infrastructure
Social Sukuk (e.g., disaster sukuk)	✓ Fund DRR education or preparedness infrastructure	✓ Build disaster shelters, mobile hospitals	✓ Rapid financing during disasters (if structured for response)	✓ Large-scale recovery financing (e.g., schools, roads)
Qard Hasan	✗	✓ Microfinance to support resilient livelihoods	✓ Emergency no-interest loans to affected individuals	✓ Loans for small businesses and home reconstruction
Islamic microfinance	✓ Fund preparedness programs for micro-entrepreneurs	✓ Enhance household and community-level financial resilience	✓ Emergency small-scale aid to business owners	✓ Rebuild livelihoods and microenterprises

Source: Authors

To harness Islamic finance effectively for DRR, policymakers in the OIC Member Countries should prioritize:

- Introducing catastrophe sukuk for DRR and climate change funding
- Improving the role of tekaful and retakaful for climate change and DRR

- Developing harmonized and enabling regulatory environments for Islamic financial instruments.
- Developing innovative Islamic finance instruments to enhance public-private partnerships and regional cooperation.
- Investing in capacity building for Islamic finance professionals focused on disaster risk and climate resilience.
- Establishing dedicated Islamic finance disaster risk funds and Sukuk-based platforms to attract private sector and community investments.
- Reconsidering the role of Islamic social financial tool on DRR strategies by improving the regulatory frameworks for instrumentalize them on DRR strategies.

All in all, Islamic finance presents a culturally congruent, ethical, and sustainable pathway to bridge funding gaps in disaster risk reduction and recovery in the OIC Member Countries. Instruments such as **zakah, infaq, and waqf institutions play a critical social safety net role, particularly for low-income, uninsured populations while takaful and retakaful** are crucial for **pre-financing risk**, especially in agriculture and property sectors. In addition, **green sukuk** and **social sukuk** may help governments and institutions to **finance infrastructure resilience** and **post-disaster rebuilding**. Finally, **qard hasan** and **Islamic microfinance** may support **economic recovery** and **community adaptation** after disasters to mobilize resources, enhance resilience, and promote sustainable development. Realizing this potential requires strategic policy reforms, institutional capacity building, and innovative product development attuned to the diverse disaster risk profiles of the OIC Member Countries.

CHAPTER 3: CASE STUDIES

In this chapter, case countries are examined using secondary sources such as reports and policy documents. To develop a comprehensive understanding of the subject matter, primary data are obtained from the key people in the relevant case countries through interviews. Indonesia, Nigeria, Azerbaijan, Qatar, and the UK (a non-OIC member) were selected as case countries. These countries were chosen based on their progress and efforts in sustainable finance, climate risks, and vulnerabilities, as well as the availability of Islamic financial instruments for green projects.

As this study aims to explore the Islamic green finance initiatives developed by policymakers and Islamic financial institutions, the analysis of secondary sources and interviews intends to cover the following areas:

1. The experience of climate change risks and natural disasters faced by the country in the past, focusing on the adverse impacts on human lives and ecology, as well as the economic consequences and the financing required to respond to such events.
2. An overview of climate and natural disaster risks specific to each country
3. The experience gained in mitigating and responding to climate and natural disaster risks in relation to financial provisioning
4. The governance structure for climate and natural disaster risks, including financial governance
5. The development trajectory of the Islamic finance sector
6. The potential of Islamic finance in addressing climate risk and natural disasters.
7. Specific Islamic financial tools designed to address climate risk and natural disasters
8. The potential of Islamic social welfare institutions, such as waqf and zakah, in mitigating climate risks and addressing natural disasters.
9. Strategies of Islamic financial institutions to address climate risk and natural disasters
10. The incentive mechanism for motivating the Islamic finance sector to develop instruments and strategies addressing climate risk and natural disasters.
11. A comparative analysis of public and private Islamic financial institutions in providing financing for climate risk mitigation and natural disaster preparedness.
12. The innovative role of global and national regulations and governance in shaping the responses of the Islamic finance sector
13. Best practices for Islamic financial strategies in addressing climate risk and natural disasters
14. The challenges faced and perceived in the Islamic finance sector related to climate risk mitigation and natural disaster preparedness.

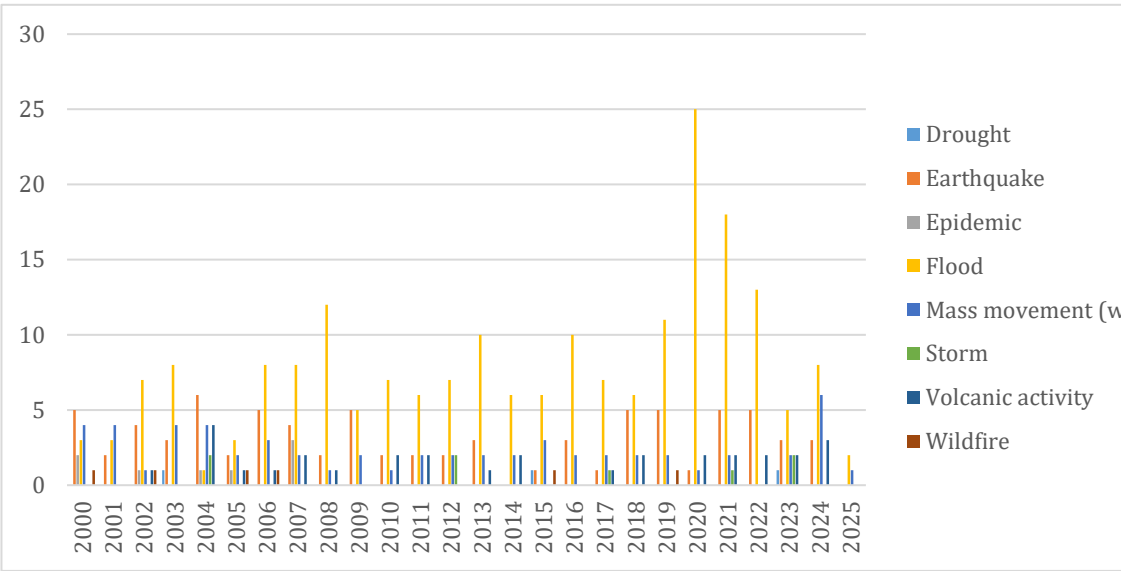
3.1. CASE STUDY: INDONESIA

3.1.1. Assessing the Country Risk for Climate and Natural Disasters

Recent Disaster Trends

Indonesia, as the world’s most populous Muslim-majority country and a member of the Group of Twenty (G20), faces an increasing exposure to climate risk. Ranked moderately vulnerable among OIC countries according to the ND-GAIN Index, Indonesia experienced approximately 400 natural disasters between 2020 and March 2025, impacting over 43 million people. Floods are the most frequent natural disaster that occurs annually in Indonesia, as shown in **Figure 11**. Despite their lower frequency, drought significantly affected populations in 2023 across multiple regions (EM-DAT, 2025).

Figure 11: Number of Natural Disasters in Indonesia 2020 – April 2025



Source: EM-DAT (2025)

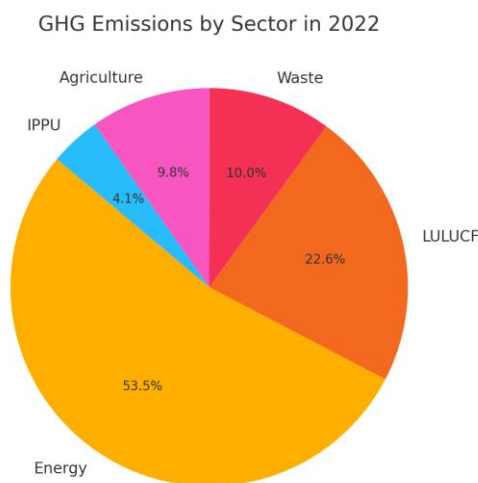
Indonesia experienced dozens of significant disaster events from 2020 to 2025. The most frequent hazards were floods and storms, followed by landslides and wildfires, while geophysical disasters (earthquakes, tsunamis, volcanic eruptions) also struck periodically (EM-DAT, 2025; BNPB, 2025). Indonesia faces significant exposure to climate and natural disasters, ranking moderately vulnerable among OIC countries (ND-GAIN Index). Geophysical events such as earthquakes and volcanic eruptions compounded climate disasters underline Indonesia's complex risk profile. The persistent frequency of these disasters poses continual challenges to Indonesia’s developmental objectives, necessitating comprehensive and sustained disaster risk reduction strategies.

GHG Emissions and Economic Impacts

Indonesia is recorded as the 5th world largest carbon emitter behind China, the United States, Russia, and India. The total greenhouse gas (GHG) emissions in 2022 reached 1.38 Gt CO₂e, including emissions from Land Use, Land Use Change, and Forestry (LULUCF) (Republic of Indonesia, 2024a). Excluding LULUCF, emissions were around 1.07 billion tons CO₂e. The energy sector remains the dominant source of emissions, followed by LULUCF, waste, agriculture, and industrial processes and product use (IPPU), which also correlate with exposure to environmental degradation and natural resource stress (**Figure 12**).

Indonesia's GHG emissions increased by approximately 62% between 2000 and 2022, driven largely by energy consumption and waste generation. This trajectory reflects the inherent tension between economic development and emissions reduction. As a result, Indonesia contributes to global warming while also facing growing climate risks. The economic toll is severe, major disasters from 2020 to 2025 caused losses amounting to billions of USD, yet many damages remain underreported, and climate-related disasters threaten to reduce GDP by several percentage points by mid-century.

Figure 12: Distribution of GHG Emissions by Sector in Indonesia (2022)



Source: Republic of Indonesia (2024a)

To manage these risks, Indonesia has pledged to cut emissions by 31.89% by 2030 (up to 43.2% with international aid) under its enhanced NDC. Meeting these targets will require massive investments, estimated at tens of billions USD annually, across energy, transport, and forestry sectors (BAPPENAS, 2023). However, fiscal resources are limited. Hence, Indonesia is leveraging climate finance tools such as green bonds, REDD+ schemes, and the USD 20 billion Just Energy Transition Partnership (JETP).

Domestically, Indonesia has launched a carbon pricing mechanism and is piloting emissions trading systems. Investment in resilience, through early warning systems, climate-proof infrastructure, and adaptive agriculture, offers high economic returns. The Ministry of National Development Planning (BAPPENAS) now integrate climate risks into fiscal and infrastructure policies, supported by pooled disaster funds and insurance schemes. Despite progress, closing

the investment gap will require strong international support and sustained private sector engagement.

To address the escalating risks posed by climate change and natural disasters, the Government of Indonesia has acknowledged the imperative for substantial financial investments in both mitigation and adaptation strategies. The country's enhanced Nationally Determined Contribution (NDC) commits to reducing greenhouse gas emissions by 31.89% below the business-as-usual scenario by 2030 through domestic efforts, and by up to 43.2% with international support. Achieving these targets will require transformative investments across key sectors, including energy, transportation, and forestry.

Vulnerability and Resilience Profile

Indonesia's vulnerability to climate change arises from its vast coastal geography, socio-economic sensitivity, and uneven adaptive capacity. As one of the world's largest archipelagic nations, it is highly exposed to sea-level rise, floods, droughts, and temperature extremes. The ND-GAIN Index consistently ranks Indonesia among the more vulnerable countries due to its low lying coastlines, dense coastal populations, and dependence on climate-sensitive sectors like agriculture, fisheries, and water resources (ND-GAIN, 2024). Water and food security are key concerns. Droughts threaten crop yields and clean water availability, while intense rainfall frequently damages infrastructure and disrupts livelihoods. Rising temperatures also elevate public health risks, increasing the spread of vector borne diseases such as dengue and malaria (Republic of Indonesia, 2024a).

To enhance resilience, the government has adopted national strategies like the National Action Plan for Climate Adaptation (RAN-API), integrated into development planning through Presidential Regulation No. 98/2021. Key tools such as the Climate Vulnerability Index (SIDIK) help identify district-level priorities for targeted action, including coastal defenses, sustainable water management, and climate-resilient agriculture. Community-based programs like ProKlim promote local adaptation through mangrove rehabilitation, water conservation, and livelihood diversification (Republic of Indonesia, 2024a).

Disaster governance is led by BNPB, supported by BMKG, which provides localized forecasts, early warnings, and hazard modeling. These efforts have helped reduce disaster-related fatalities. Traditional knowledge is also integrated into resilience strategies, recognizing Indonesia's diverse local contexts. Coordination is facilitated through the National Registry System for Climate Change (SRN-PPI), a digital platform that tracks adaptation efforts, funding, and progress toward climate goals while improving transparency and alignment with international support. However, regional disparities in technical capacity and funding persist, with under resourced districts struggling to implement basic measures. Structural issues like poverty, informal settlements in hazard prone zones, deforestation, and land subsidence intensify vulnerabilities (World Bank, 2024a; UNDRR, 2022). While Indonesia's adaptive capacity is improving, it remains uneven. Sustained investment in multi level governance, data driven planning, and equitable support is crucial to ensure that climate resilience efforts benefit all regions and communities.

Physical and Transition Climate Risks

Indonesia faces both physical and transition climate risks that threaten its population, economy, and ecosystems. Physical risks appear as acute events, such as floods, cyclones, landslides, heatwaves, droughts, and wildfires, as well as chronic changes like sea level rise, shifting rainfall patterns, ocean warming, and increasing temperatures. Many of these hazards are already

common in Indonesia and are projected to intensify due to anthropogenic climate change (IPCC, 2021).

Rising sea levels (0.2–0.3 meters by mid-century) threaten Indonesia's 80,000 km of coastline and thousands of low lying islands, increasing coastal erosion, flooding, and saltwater intrusion (IPCC, 2021; BMKG, 2025). Heatwaves are expected to become more frequent and prolonged, raising health risks and reducing productivity, particularly in urban centers impacted by the heat island effect.

Critical infrastructure, such as roads, ports, power grids, remains highly vulnerable to these events, while agriculture and fisheries suffer from drought, flooding, and ocean acidification (BMKG, 2025; IPCC, 2021). Water resources are also under increasing pressure from altered rainfall and higher evaporation. These stressors often combine, for example, drought can dry peatlands, fueling wildfires, while intense rain on degraded land heightens flash flood risks. The 2019–2020 dry to flood cycle in Java illustrates such compounding hazards (BMKG, 2025).

Agricultural productivity in Indonesia is highly climate sensitive. Droughts associated with El Niño events have historically led to reduced rice yields, while flooding events compromise harvests and damage irrigation systems. The fisheries sector is also at risk, given Indonesia's reliance on coral reef ecosystems, which are under pressure from ocean warming and acidification (Republic of Indonesia, 2024a). Water resources, especially in regions dependent on seasonal rainfall, are increasingly under stress due to reduced precipitation during dry seasons and elevated evapotranspiration rates in a warming climate.

Transition risks arise from Indonesia's dependence on fossil fuels, especially coal, which supplies about 60% of its electricity. Global decarbonization efforts may reduce demand, creating stranded assets and affecting mining-dependent regions (World Bank, 2024a; IMF & World Bank, 2024). Regulatory changes like the EU's Carbon Border Adjustment Mechanism could impact Indonesia's exports, while rapid technological shifts demand industrial modernization.

Financial institutions are increasingly assessing climate risks. The IMF warns that an uncoordinated transition could destabilize Indonesia's economy, while a managed shift offers growth opportunities in renewables, electric vehicles, and green manufacturing (IMF & World Bank, 2024; Republic of Indonesia, 2024c). In response, Indonesia has introduced the Carbon Economic Value policy and is piloting emissions trading. Its goals include peaking power-sector emissions by 2030 and expanding renewable energy to 2040 targets. It also aims to build domestic capacity in critical minerals for battery production.

Indonesia's multifaceted climate risks demand coordinated policy responses. Delay could heighten vulnerabilities, while strategic investment and a well managed transition could strengthen long term resilience and inclusive growth.

Climate Change Projections and Compound Risks

BMKG in partnership with international climate modelling institutions, has developed regionally downscaled climate projections for Indonesia to assess mid-21st century climate trends. These projections compare the period 2020–2049 against a historical climatological baseline (1976–2005) and utilize Representative Concentration Pathways (RCPs) 4.5 and 8.5 to reflect intermediate and high greenhouse gas emission trajectories, respectively. The model outputs consistently indicate significant warming across all regions of the archipelago.

By mid-century, surface air temperature is projected to rise by 1.0–1.2 °C under RCP4.5 and exceed 1.3 °C under RCP8.5, on top of ~1 °C already observed over the past five decades (BMKG,

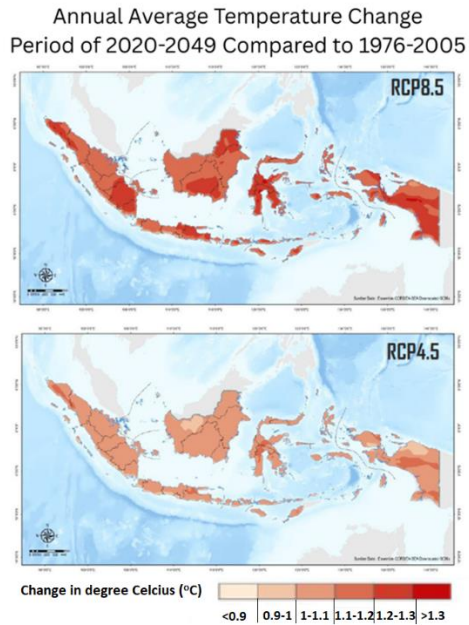
2025). This warming will likely increase the frequency and intensity of hot days and heatwaves, especially in urban areas affected by the heat island effect. These trends underline the need to integrate adaptation into urban planning and public health systems.

Figure 13. illustrate spatial variations in projected surface air temperature increases across Indonesia under two Representative Concentration Pathways (RCPs). Under the high-emission scenario RCP8.5 (top map), most regions are expected to experience a rise in average annual temperatures exceeding 1.3°C. Under the intermediate-emission scenario RCP4.5 (bottom map), the projected temperature increases are more moderate, generally ranging between 1.0°C and 1.2°C. These projections are based on downscaled climate models using historical climatology as a baseline and highlight the heightened warming risk associated with higher greenhouse gas emissions.

Rainfall projections reveal complex and regionally varied patterns. Under RCP8.5, the dry season (June–August) is expected to become drier, especially in Java, Nusa Tenggara, and parts of Sumatra, increasing drought risks (BMKG, 2025). Meanwhile, rainfall during the wet season (December–February) may become more erratic, with short bursts of heavy rain leading to flash floods (See **Figure 14.**). Even if annual precipitation stays stable or decreases slightly, rainfall intensity is projected to increase, posing flood management challenges.

Indonesia’s diverse climate zones, ranging from equatorial rainforests in Sumatra and Papua to monsoonal and semi-arid regions, will experience these changes differently. For example, Aceh and North Sumatra may see slight rainfall increases, while Java and Bali could see worsening dryness (BMKG, 2025). Temporal changes in seasonality are also a concern, with delayed rainy season onset potentially disrupting rice planting and harvest cycles (IPCC, 2021; BMKG, 2025).

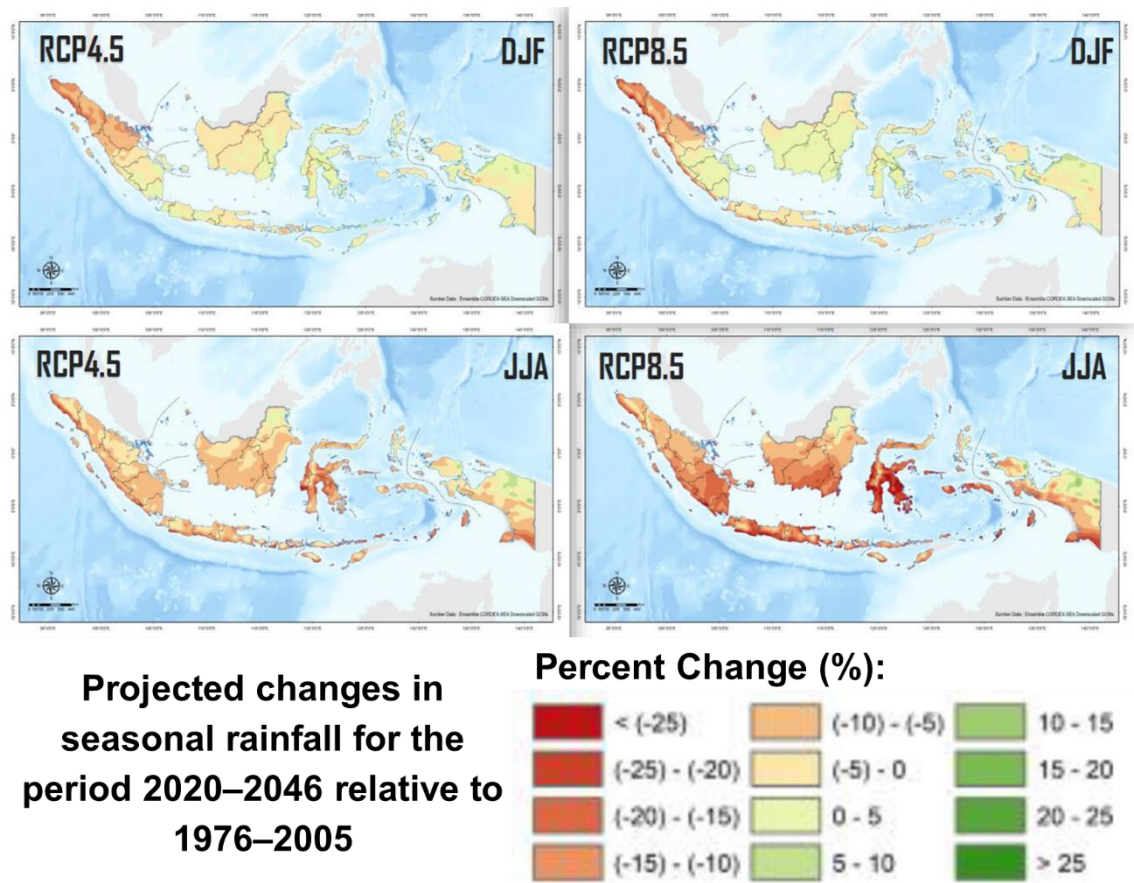
Figure 13: Projected Annual Average Temperature Change in Indonesia for the Period 2020–2049 Compared to the Historical Baseline (1976–2005) Under Two Emission Scenarios



Source: BMKG (2023), derived from CORDEX-SEA downscaled CMIP5 data

Compounding risks, such as droughts followed by intense rainfall, may escalate damage. As warming increases global atmospheric moisture capacity (~7–14% per °C), extreme rain events are likely to intensify, overwhelming drainage systems and river channels (IPCC, 2021). Pluvial and fluvial flood risks are projected to rise significantly, particularly under RCP8.5 (BMKG, 2025).

Figure 14: Projected Seasonal Rainfall Change in Indonesia for the Period 2020–2049 Compared to 1976–2005 Under RCP4.5 and RCP8.5 Scenarios



Source: BMKG (2023), based on CORDEX-SEA downscaled CMIP5 climate projections

Sea-level rise (SLR) is another major concern. Projections suggest SLR of 20–30 cm by 2050, with greater effective rise in subsiding cities like Jakarta (BMKG, 2025). High tides and storm surges may turn what are now rare coastal floods into annual events (IPCC, 2021). Small islands and coastal zones face risks of salinization, erosion, and displacement.

Addressing these risks will require robust adaptation strategies such as coastal defenses, mangrove restoration, and planned relocation of infrastructure and communities. These actions are essential components of Indonesia’s national resilience agenda (BMKG, 2025; IPCC, 2021).

3.1.2. The Trajectory of Islamic Finance: Institutionalization, Legal and Regulatory Framework, and Financial Standing with Particular Reference to Climate Risk Mitigation and Natural Disasters Preparedness

Institutional Arrangement

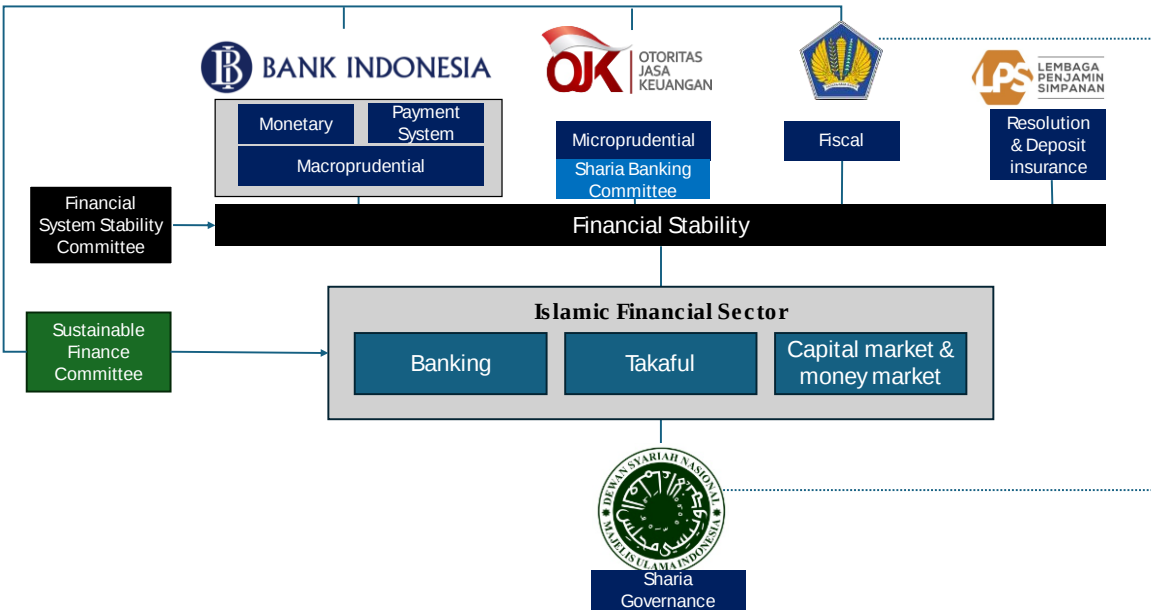
Indonesia has developed a strong institutional framework to safeguard financial stability and promote sustainable finance. The Financial Sector Omnibus Law (FSOL) No. 4 of 2023 marked a major structural reform that clarified the mandates of key financial regulators:

- Bank Indonesia (BI): Central bank responsible for monetary policy, payment system, and macroprudential policy and oversight for the banking sector.
- Financial Services Authority (OJK): Regulates and supervises microprudential aspects for banking, capital markets, and non-bank financial institutions.
- Financial System Stability Committee (KSSK): A high-level coordination forum chaired by the Ministry of Finance (MOF) as the fiscal authority, with members comprising BI, OJK, and the Indonesian Deposit Insurance Corporation (LPS), the banking resolution authority. The KSSK coordinates national financial stability policy, reporting directly to the President.

To further improve the enabling green environment, the FSOL mandates the establishment of Sustainable Finance Committee, comprises of the MOF, BI and OJK, to coordinate and optimise their policies in supporting sustainable finance, develop supporting data and infrastructure system, as well as sustainable taxonomy.

The DSN-MUI, under the Indonesian Ulama Council (MUI), is the authoritative body on Shariah compliance for financial activities. DSN provides legal clarity and safeguards Shariah integrity. Financial authorities regularly consult DSN-MUI during policy formulation and product development.

Figure 15: Islamic Financial Stability Regulatory & Supervisory Landscape



Islamic Finance Industry Development

Indonesia's Islamic financial sector is steadily growing, reaching IDR2,582.25 trillion (USD 167.5 billion) in assets by 2023, or 10.95% of total financial system assets (OJK, 2024). Islamic banking constitutes the backbone of this growth, holding 7.18% of total banking assets in 2024, with a year-on-year growth rate of 9.88%. The market is dominated by 14 full-fledged Islamic commercial banks, which contribute the largest share of Islamic banking assets (67.8%), followed by 19 Islamic windows and 174 Islamic rural banks. Under the FSOL, regulatory reforms have enabled Islamic commercial and Islamic window banks to serve as *waqf nadzir* (waqf managers) and manage cash waqf-linked deposits. Performance-wise, Islamic banks have outpaced their conventional counterparts in higher growth rates of assets, deposits, and financing activities (OJK, 2025a, 2025b). Their emphasis on profit-sharing contracts (*musharaka* and *mudharaba*) underlines the distinctiveness of Islamic finance. In terms of green financing, **Islamic banking**, as the predominant sector within the Islamic finance industry, holds significant potential to contribute toward climate goals achievements. This is particularly through the investments in green sukuk, facilitating green financing and support the debtor transformation to be more sustainable or greener in order to support the achievement of Indonesian NDC.

Sovereign sukuk plays predominant role in Islamic financial assets, representing approximately 56% of Islamic financial assets in 2023, followed by Islamic banks at around 34% (OJK, 2024). Other instruments and players such as corporate sukuk, mutual fund, insurance and pension fund and other financial institutions only account for around 2-4%, respectively. At national level, private sector involvement in green bonds issuance has been limited, highlighting reliance on sovereign and state-owned enterprises' issuances to drive market growth (World Bank, 2024b). Sovereign sukuk market share in 2023 was around 20.14% of the total sovereign bonds (OJK, 2024). This reflects continued contribution of Islamic finance instrument in financing Government budget, infrastructure, and financial market development.

Islamic social finance, particularly *zakah* and *waqf*, increasingly contributes to national financial resilience. The presence of sizable Islamic social funds can be beneficial as a financial cushion to lower income society in any economic cycle. According to The National Amil Zakat Agency (BAZNAS), the collection of Islamic social funds in Indonesia reached IDR 22.43 trillion in 2022, increasing 58.9% compared to the previous year. However, there is a significant untapped waqf potential due to limited 1.2% collected amount in 2023 from around \$11 billion annual potencias as estimated by the National Waqf Board (Vice President Office of Republic Indonesia, 2021; Astarudin, 2024).

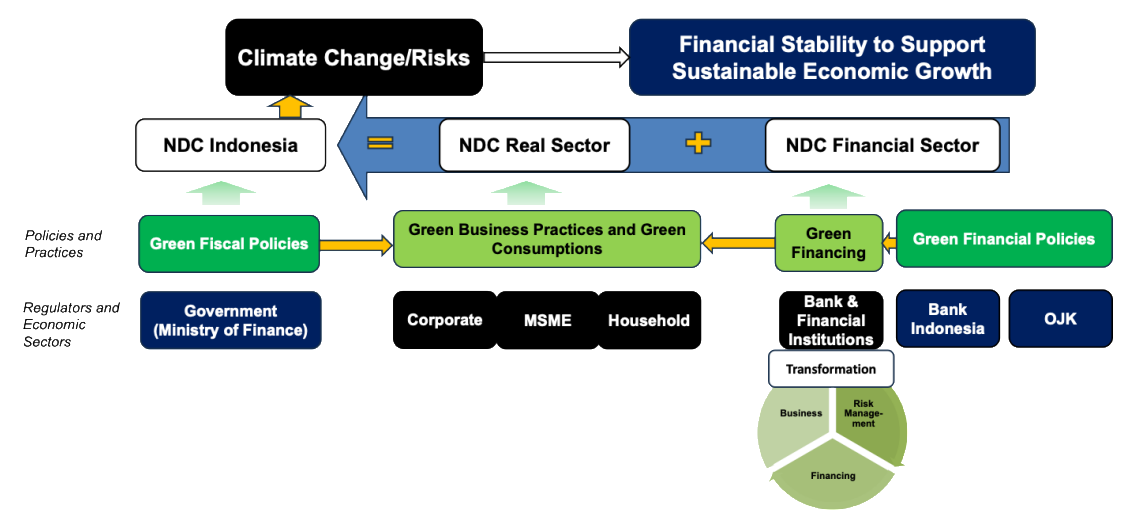
Indonesia ranks among global leaders in Islamic finance, with high placements in the Islamic Finance Development Indicator (ICD & LSEG, 2024), Global Islamic Economy Index, and Islamic Fintech rankings. The issuance of sovereign green sukuk has earned international acclaim, highlighting its innovative contributions (OJK, 2024). There is a strong national commitment to developing Islamic banking to support an inclusive, sustainable and robust economic growth under the five-year Islamic finance sectoral roadmaps.

Regulatory Landscape to Promote Green Finance

The underlying premise of Indonesia's regulatory efforts is that addressing climate-related financial risks is integral to safeguarding financial stability and achieving sustainable economic growth. Policymakers across key institutions are working collaboratively to support the realization of Indonesia's NDCs. The Government, through green fiscal policies, incentivizes environmentally responsible business practices and consumption across broader economic

sectors. Complementing these efforts, BI and OJK have introduced green financial policies that aim to promote green financing by encouraging sustainable transformation in business models, risk management frameworks, and financing practices.

Figure 16: Collective Contribution of Regulators and Economic Sectors in Green Transition



Source: BI (2023)

Some key milestones are:

Ministry of Finance
Green Sukuk Issuance. In March 2018, Indonesia pioneered the issuance of the world’s first sovereign green sukuk, raising USD 1.25 billion. The sukuk attracted a diversified investor base, including conventional, Islamic, and green investors. Eligible projects must promote the transition to a low-emission economy and climate-resilient growth. The Government has issued green sukuk in both global and domestic markets since 2018. For domestic market, it targets institutional investors (wholesale) and retail segments. Indonesia’s global green sukuk issuance adheres to AAOIFI standards, expanding market access, particularly to Islamic finance hubs such as the UAE. Green Bond and Sukuk Framework. The Green Bond and Sukuk Framework was developed in 2018 to facilitate the instrument issuance for green project financing to reduce greenhouse gas (GHG) emissions, promote transition to low-emission and climate resilient economy, including climate mitigation, adaptation and biodiversity. It guides issuance and ensure compliance with international standards (ICMA Green Bond Principles). The framework incorporates a comprehensive <i>Climate Budget Tagging</i> mechanism, involving 17 ministries, ensuring consistency with national climate targets (NDCs). Governance transparency is maintained through annual impact reporting and independent third-party verification.

OJK

Sustainable Finance Roadmaps. In 2014, OJK established Sustainable Finance Roadmap Phase I (2015-2019) to escalate the financial sector contribution, particularly capital markets, toward national commitment on climate actions. OJK has also established Sustainable Roadmap Phase II (2021-2025) as a further blueprint for sustainable transformation of the financial sector to strengthen resilience and competitiveness, aiming at among others: accelerating the ESG implementation through the development of a green taxonomy, implementation of ESG into risk management, and development of innovative sustainable financial products and services.

Regulatory Framework. In 2017, OJK required financial services institutions, issuers and public companies to provide the funding sources needed for achieving SDGs and ensuring adequate climate financing through OJK Regulation No. 51/POJK.03/2017. It also requires these entities to prepare sustainable finance action plans and communicate it to shareholders and internal organisation and ensure that they have sufficient environmental and social management policies and processes in place. In addition, OJK can provide incentives such as sustainable finance award and capacity building programs. To further facilitate green finance, OJK also issued a regulation on the Issuance and the Terms of Green Bond (60/POJK.04/2017) to support the issuance of green projects, requiring 70% proceeds to finance green projects.

Green and Sustainable Finance Taxonomies. In January 2022, OJK developed Indonesia Green Taxonomy 1.0 as the implementation of Roadmap Phase II. The Taxonomy provides an overview on the classification of economic activities that support environmental protection and management efforts, as well as mitigation and adaptation to climate change. In February 2024, OJK also issued sustainable finance taxonomy to support classification of economic activities in achieving SDG objectives and net zero emission by 2060, referring to ASEAN Taxonomy for Sustainable Finance.

Climate Risk Integration and Carbon Trading. In 2023, Climate Risk Stress Testing (CRST) and OJK Regulation (18/POJK.04/2023) on the issuance of sustainable bonds and sukuk were established. CRST issuance is targeted to support the implementation of bottom-up stress test to encourage risk awareness and measurement, as well as integration of bank climate risk management. OJK regulation on issuance and requirements for sustainable debt securities and sukuk to support a broader investment on social, sustainability, waqf sukuk, and sustainability-linked bonds. It revokes and supersedes the previous OJK regulation (60/POJK.04/2017) by expanding the Islamic financial instruments. In addition, OJK introduced regulation in 2023 on Carbon Trading through the Carbon Exchange along with the launch of the Carbon Exchange (IDX Carbon).

Finally, in the roadmap of Islamic banking for 2023-2027, the targets have been continued to increase their role in sustainable finance. Similarly, the insurance and pension funds in their 2023-2027 roadmap are also encouraged to increase their green investment, increase the use of electric vehicle, and other research and programs to support NDC achievement.

Bank Indonesia

Green Macroprudential Policies. There are three green macroprudential policies to support sustainable finance, namely loan-to-value (LTV) for property credit and down payments for green vehicles since 2019, macroprudential inclusive financing ratio (updated in 2022) and

macroprudential liquidity incentives policy (2023). These policies are targeted to accelerate the green finance growth, invest in sustainable finance instruments and provide incentive for banks to incorporate sustainable practices in loan assessments and increase their financial allocation for financing green activities. In addition, BI, in collaboration with Coordinating Ministry for Maritime and Investment Affairs and others, has developed the Green Calculator application to facilitate measurement of GHG emissions by banks and businesses (borrower).

Central Bank Green Initiatives. BI has included green consideration within its foreign reserve management for green projects and providing operational support and investment in the sovereign green sukuk (Livingstone, Speer, Herbert, & Clavijo, 2024). In terms of central bank policy mandates, the Green Central Banking Scorecard 2024 put Indonesia in 9th rank among the G20 countries, particularly in the area leading by example, research and advocacy, monetary policy and financial policy (Livingstone, Speer, Herbert, & Clavijo, 2024). Bank Indonesia has also issued Sukuk Bank Indonesia (SUKBI) to encourage monetary policy and money market development, in which its underlying could cover green Sovereign Sukuk held by Bank Indonesia.

3.1.3. Islamic Financing Provisions for Climate Risk Mitigation and Natural Disasters Preparedness: Institutions, Products, and Offerings

Despite notable growth in the green finance market, Indonesia still faces significant financing gaps in achieving its climate targets (World Bank, 2024b). Islamic finance provides a valuable alternative source of climate-related funding through instruments such as green sukuk, green Shariah-compliant loans, and Islamic social finance, particularly waqf. Currently, green sukuk is the most rapidly expanding instrument in Indonesia, while Islamic green lending and waqf-based financing remain underdeveloped due to limited institutional capacity.

Indonesia is among the first movers in Islamic sustainable finance. It is among the largest issuers of green sukuk and the first issuer of Sovereign green sukuk in 2018, which raised USD 1.25 billion, and in 2019 issued the global's first retail green sukuk. The Government issued \$2.75 billion long five-year, 10-year and 30-year sukuk, represented as the largest Sukuk from Asia in 2024 (Shah, 2024). Since 2018 it has raised around \$13 billion for climate change adaptation (LSEG, UKIFC & GEFI, 2024; LSEG, 2025). Despite green sovereign sukuk still accounts for a small share of Indonesia's total sukuk issuance, but it is growing, signaling strong future potential.

The green sukuk market was driven by the Government as the key and the only green sukuk issuer from Indonesia (YTD). In 2024, Indonesia is one of the global ESG sukuk issuance leaders, which accounted for 23% of total ESG sukuk issuances (LSEG, 2025). From total Indonesia's sukuk issuance of \$3,802 million in 2024, around 93% is green sukuk by the Government and the rest is corporate ESG sukuk which issued in domestic market. The latest global green sukuk issuance was in July 2025, amounting to USD1.1 billion with a 10-year maturity under a wakalah contract, bringing the total accumulated global green sukuk issuance since 2018 to USD7.7 billion (DJPPR, 2025). The Government's efforts reflect the country's priority in addressing climate risk through innovative Islamic finance instruments from a fiscal policy perspective to complement financial sector authorities' efforts.

In terms of financing contract, most of Indonesia's green sukuk issuance utilised wakala bil istithmar (72%), predominantly for global market issuance. The other contracts used are ijarah (16%) for domestic issuance and hybrid (12%) for global market. Based on the Guidance on Green, Social, and Sustainability Sukuk (ICMA, IsDB & LSEG, 2024), there are still other financial contracts that have yet to be explored by the Government such as the partnership and profit-

sharing contracts. This is also aligned with the DSN verdicts (2008a; 2008b; 2010; 2014) which also permit other contracts for sovereign sukuk such as *mudharabah*, *musharakah*, and *istisna*, offering significant untapped potential for innovative financing structures.

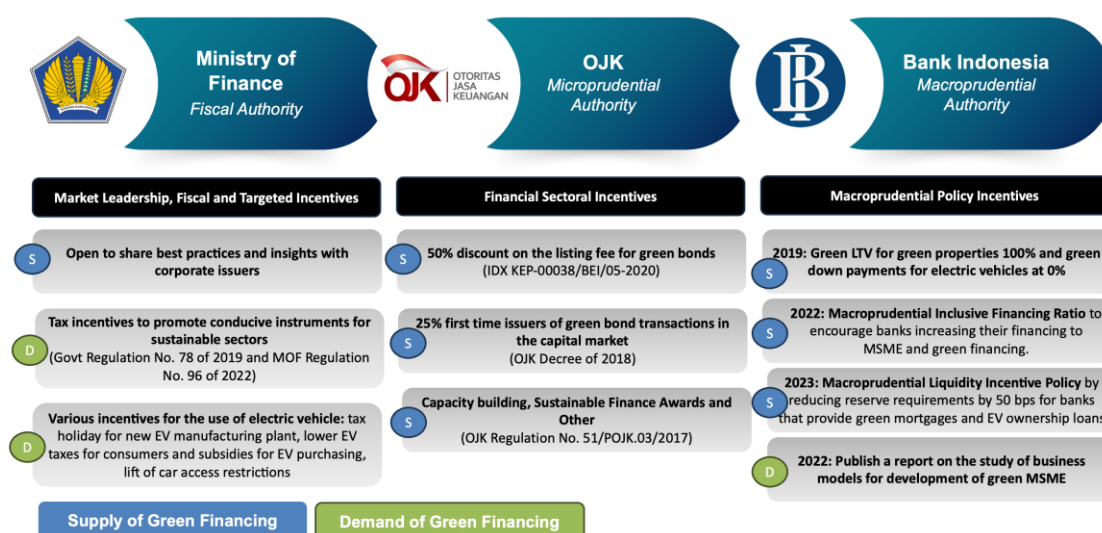
The 2023 sovereign green sukuk issuance attracted increasing interest from European investors (36%), closely matching demand from Asian investors (37%) (MOF, 2024). Institutional investors—primarily asset managers (55%), insurers/pension funds (21%), and banks (18%)—dominated international subscriptions. Domestically, banks played a significantly larger role, accounting for approximately 72% of wholesale sukuk investments, encouraged by regulatory incentives recognizing sukuk as High-Quality Liquid Assets (HQLA) and the recognition of green financing instrument for the calculation of macroprudential inclusive financing ratio. Another possible contributing factor is limited option of Sharia compliant of HQLA instruments. Retail green sukuk has notably attracted a diverse demographic, with Generation X and Baby Boomers comprising around 70% of retail investors, while millennials represented approximately 25%, highlighting the growing appeal of ethical and Shariah-compliant investments among younger generations.

The interaction between fiscal and monetary policy is the issuance of sukuk Bank Indonesia (SukBI), which proceeds are partially allocated to purchasing green government sukuk (Herbert, 2024). BI has also maintained sustainability linked bonds as parts of its reserved portfolio, further aligning national monetary policy with sustainability objectives.

Islamic social finance also presents promising opportunities for climate finance. The Indonesian Waqf Board (Badan Wakaf Indonesia/BWI), in collaboration with the United Nations Development Programme (UNDP), developed a pioneering Green Waqf Framework in 2022, aiming to mobilize waqf assets towards environmental and sustainability objectives while providing socio-economy impact to the society. Nevertheless, the actual collection is far more than its potential.

3.1.4. Incentive Mechanisms to Develop Islamic Financing Responses

Figure 17: Regulatory Incentives



Effective incentive mechanisms are critical to accelerating the adoption and issuance of Islamic green financial instruments in Indonesia. The country employs a multi-layered incentive structure through fiscal policies, macroprudential measures by BI, and microprudential initiatives from OJK that support supply and demand sides of green financing (Figure 3.16).

Fiscal Measures

The MOF plays a central role in promoting green financing not only through both market leadership and targeted incentives, but also by actively engaging in global forums and sharing best practices to encourage private sector participation. The government provides several tax-based incentives to attract investment into sustainable sectors: (i) accelerated depreciation of tangible fixed assets and amortization of intangible assets, (ii) imposition of income tax on dividends of 10%, and (iii) extended loss compensation over 5-year period up to a maximum of 10 years in targeted sectors, such as renewable energy and geothermal, referring to the Government Regulation No. 78 of 2019 and Ministry of Finance Regulation No. 96 of 2020 (IIPC, n.d.). Additional fiscal incentives are designed to promote energy transition and the adoption of electric vehicles through tax breaks and consumption subsidies. These incentives, while not sukuk-specific, foster a broader enabling environment for green investment.

Macroprudential Policies

Bank Indonesia is one of the central banks that advancing in the implementation of green macroprudential. At current stage, the incentives are offered through this policy particularly to encourage banks extending loans/financing to priority and green sectors. In 2019, BI introduced green LTV ratios and down payments for green properties and electric vehicles. BI has also implemented the Green Macroprudential Incentive which offers a reduction in reserve requirements for banks that disburse green loans above a certain threshold. In 2021 (updated 2022), BI issued Macroprudential Inclusive Financing Ratio for conventional and Islamic banks to accelerate credit growth, particularly for SMEs, and improve financial inclusion. The ratio is determined by banks and set in their business action plan according to their capacity and business model, with annual gradual increase. In 2023, BI introduced the Macroprudential Liquidity Incentive Policy, which focuses on sectors with a stronger multiplier effect on economic growth and job creation, particularly in downstream sectors, housing, tourism, inclusive sectors, as well as the green economy and finance. It aims to complement the LTV ratio by enhancing its effectiveness through reduction in the reserve requirement for banks extending electric vehicle (EV) loans. In addition, BI also published a report on the study of business models for development of green MSME in 2022.

Microprudential

In terms of capital market, the Indonesia Stock Exchange's (IDX) Board of Directors Decree of 2020 (Kep-00038/BEI/05-2020) provided a 50% discount on the listing fee for green bonds. Furthermore, to further promote green or ESG issuance, OJK provides the 25% discount offered to first-time issuers who registered their green bond transactions in the capital market under its Board of Commissioners Decree of 2018. The OJK has several initiatives on incentives for issuers of green financial instruments, including capacity-building, sustainable finance awards, and other incentives. These measures are designed to lower barriers for issuers and promote a deeper and more diversified green sukuk market.

3.1.5. Best Practices: Lessons Learned

Indonesia's progress in Islamic green financing offers several replicable lessons for OIC countries, grounded in strong regulatory coordination and innovation across fiscal, monetary,

and market policies. Notably, the authorities balance initiatives between mobilizing green investments and enhancing climate resilience within the financial system.

Figure 18: Best Practices: Lessons Learned from Indonesia



Legal Mandate

Strong Legal and Institutional Foundation. The FSOL 2023 provides necessary mandates for financial sector authorities to support sustainable finance. It established clear roles, enhanced regulatory certainty and direction, improved market confidence and collaboration through the Sustainable Finance Committee to harmonize green finance policies and accelerate infrastructure development.

Policy Development

Sustainable Finance Roadmap. OJK’s two-phase Sustainable Finance Roadmaps (2015–2019 and 2021–2025) offer a comprehensive strategic vision. These roadmaps address both supply and demand-side factors, encompassing policy alignment, product innovation, awareness, market infrastructure, capacity-building, and stakeholder collaboration. The roadmap complements binding regulations like OJK Regulation No. 51/POJK.03/2017, ensuring gradual compliance and cultural adoption of sustainable practices.

Green Macroprudential Innovation. BI has implemented a pro-active green macroprudential that not only addressing potential climate risk to become a systemic risk in the financial system but also providing incentives to promote green finance accompanied by prudential principles. These regulations complement the microprudential policy approach, and more targeted to certain sectors, such as green properties and automobiles. Another innovative approach on carbon calculator through application is useful as early warning tools to financial sector to show their carbon exposures in economic activities, facilitate disclosure requirements and open access to green financing. Collaboration with other ministry is expected to broaden the use of such innovative tool.

Market Infrastructure

Taxonomies and Green Finance Regulations. The development and implementation of detailed green and sustainable finance taxonomies significantly contribute to standardizing sustainable finance practices. These taxonomies classify economic activities according to their environmental impact and alignment with climate targets, enhancing transparency and comparability with international. The use of taxonomies can support to measure green performance align with the IFRS S2 climate-related disclosure standard, support the development of climate risk management and scenarios by bank, and development of sustainability sukuk, and other financial instruments (NGFS, 2024). Together with OJK's expanded regulation on green instrument issuance, these frameworks further foster capital mobilization towards low-carbon and environmentally sustainable investments.

Transparency Reporting and Impact Disclosure. Adhering to international standards, such as the ICMA Green Bond Principles, Indonesia regularly publishes comprehensive annual reports detailing green sukuk proceeds allocation and measurable impacts. This transparency enhances market credibility, investor trust, and facilitates data-driven policy refinement.

Innovation

Climate budget tagging system. The MOF has employed a robust climate budget tagging mechanism, ensuring green sukuk proceeds are aligned with NDCs. This system facilitates cross-ministerial coordination, transparent tracking of climate-related expenditure, and green projects prioritization.

Innovative Sovereign Green Retail Sukuk. Indonesia introduced global green retail sukuk in 2019, as an innovative solution from the Islamic finance industry. This innovative product broadened investor access, particularly attracting socially responsible investors seeking Shariah-compliant ethical investments.

Integration of Islamic Social Finance. Recognizing the untapped potential of Islamic social finance, Indonesia has integrated technology-driven solutions like the "Satu Wakaf Indonesia" (One Waqf Indonesia) application. This innovative platform, supported by BI and BWI, effectively mobilizes cash waqf resources, transparently channelling them towards social, education, health, sanitation, productive economic sectors, and infrastructure development. BWI also introduced a productive waqf platform to facilitate collaboration among waqf managers, businesses, CSR funds, and investors, potentially expanding this model to green waqf projects under the Green Waqf Framework.

Collaboration across Financial Authorities. Collaboration through macroprudential and microprudential has been supported to coordinate the financial sector policy. In addition, each issuance of new green Sovereign sukuk will be informed to BI as consideration for its green macroprudential policy implementation. The Sustainable Finance Committee could further optimise policy support, which particularly important to ensure that there is no policy-trade off at national level and create policy synergies.

3.1.6. Country-Specific Policy Recommendations

Despite significant advancements, several challenges remain in Indonesia's Islamic green finance industry:

- (1) limited green and sustainability sukuk offerings despite the increasing demand, particularly for the corporate sukuk.

- (2) lack of understanding of Sukuk and sustainability principles in investors which necessitate the need for capacity building to address knowledge gap and expand the market.
- (3) lack of understanding of issuers limiting the issuance of green and sustainability sukuk, particularly regarding the processes, costs and requirements.

There are still potential room of improvements to accelerate existing regulatory efforts.

Further Unlocking Corporate Sukuk Market Potentials. One of challenges to develop corporate sukuk market is the availability of green and sustainability projects and measure the potential environmental impacts. Having a robust infrastructure such as the green certifications is necessary but requires regulatory support. In term of regulatory support, one of the important milestones at global level is the issuance of new guidance on green, social and sustainability sukuk by LSEG, ICMA and Islamic Development Bank in April 2024 which aims at promoting the issuance and labeling their sukuk as well as comply to ICMA Principles. It might be necessary for OJK to consider the alignment of their regulation to the guideline to support broadening corporate sukuk investor base beyond traditional sukuk investor and reach global scale. Increasing certification and compliance to the international standards will in turn help the industry to address green washing problem.

Diversification of Islamic Financing Contracts and Sukuk Models. Given that currently the Government only applies *ijarah*, *wakalah* and hybrid contracts for green sukuk, there is a potential to explore other types of contracts. In addition, there is also potential to explore subclass of green sukuk, such as blue sukuk, given that the Government has the experienced to issue blue Samurai bond in accordance with ICMA principles in May 2023.

Enhancing Regulatory Collaborations. Each authority has their ambitious plans and regulations, but it is important to ensure there is no policy trade-off across sectoral regulations. The establishment of Sustainable Finance Committee serves as important collaboration platform for key financial regulators. It is essential to optimise the forum to enhance collaboration. Another regulatory homework is the development of insurance markets to provide financial protection and resilience against climate risk disasters, particularly for financial institutions and MSMEs, such as in agriculture sectors.

Increasing Capacity Building and Literacy for Issuers and Investors. Increase capacity building with issuers is important as a support to encourage corporate green sukuk development, particularly to share the experience from the Government in navigating the global market penetration and from prudential and capital market authority to ensure compliance to the domestic and global regulations. Increasing financial literacy for investors is also important to realise the greenium impacts, particularly given additional costs incurred for the verification of green and Sharia compliance instruments. There is an awareness from the regulators to increase investor education to help establish clearer pricing recognition and incentives.

Promoting Innovative Financing Models. Innovative financing models, such as public-private partnerships, blended finance, and de-risking strategies can help attract the necessary capital. Public-private partnerships can be explored to ensure availability of green financing outlets. Potential blended financing of Islamic commercial and social finance promises a huge potential particularly through the Satu Wakaf Indonesia platform. This initiative supported by regulatory efforts can facilitate mobilisation of CSR funds or commercial funds from the banking sector to the green financing projects managed by authorized *nadzir* under BWI governance and regulators' (BI and OJK) assistance.

Leveraging Technological Innovation. The use of technological innovation is important in advancing the potential of Islamic social finance. Following the OJK regulation to allow Islamic banks as *nadzir*, this can help to unlock the cash *waqf* potential by improve its collection, transparency, accountability, literacy and address financial inclusion problems, such as through mobile banking. Investment in technology upgrades is a key to enhance service delivery, as evidence by the BWI platform which has facilitated business matching of sharia compliant investors seeking and green projects owner, as well as green *waqf* movement. In addition, the MOF together with relevant ministry are improving their climate budget tagging particularly to make some automation in the reporting process which will help to improve efficiency and accountability of the use of proceeds. This highlights the importance of leveraging technology while promoting sustainable finance and climate actions.

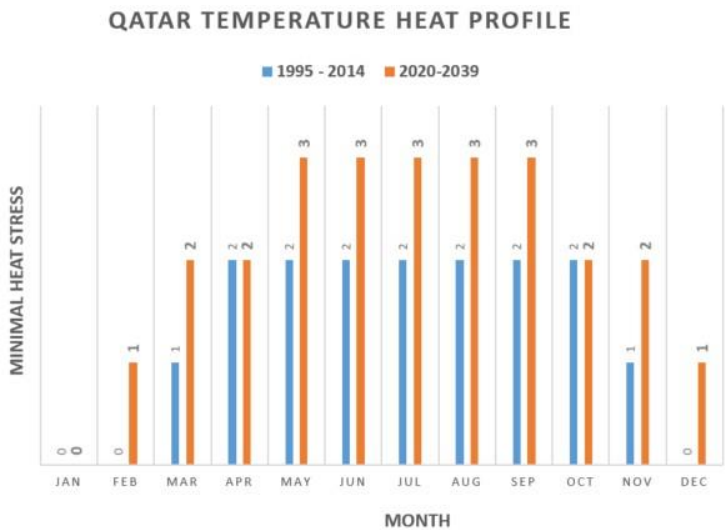
3.2. CASE STUDY: QATAR

3.2.1. Assessing the Country Risk for Climate and Natural Disasters

Recent Disaster Trends

Qatar is highly susceptible to climate-related hazards, with recent years marked by extreme heat events, flash floods, sandstorms, and persistent water scarcity. The most notable recent disaster was the 2018 flash floods, which caused severe infrastructure disruption, affected over a thousand individuals, and resulted in damages exceeding \$11.8 million. In April 2024, another major event struck when a powerful regional storm system led to flash floods across the Persian Gulf. Northern Qatar, including Al Shamal and parts of Doha, experienced unusual rainfall that forced the closure of schools and public buildings. These repeated flood events reveal how rare storms are becoming more sudden and more disruptive, particularly in urban areas where water cannot drain easily. The country experiences frequent and intense heatwaves, with maximum temperatures in some areas reaching the mid-40s Celsius in 2025. Rainfall remains scarce and highly variable, but when it does occur, it can lead to sudden flooding due to the country’s arid landscape and urban concentration. In addition to water scarcity, dust and sandstorms have become a regular hazard. They are driven by the seasonal Shamal wind and are frequently recorded at both Hamad and Doha International Airports. These storms harm air quality, disrupt visibility, and put vulnerable groups at risk. Desertification and groundwater depletion are ongoing concerns, with Qatar’s groundwater reservoir declining by 25% due to overuse and poor irrigation practices.

Figure 19: Temperature-Based Heat + Population Risk Categorization by month, for 1995-2014 and Projected 2020-2039



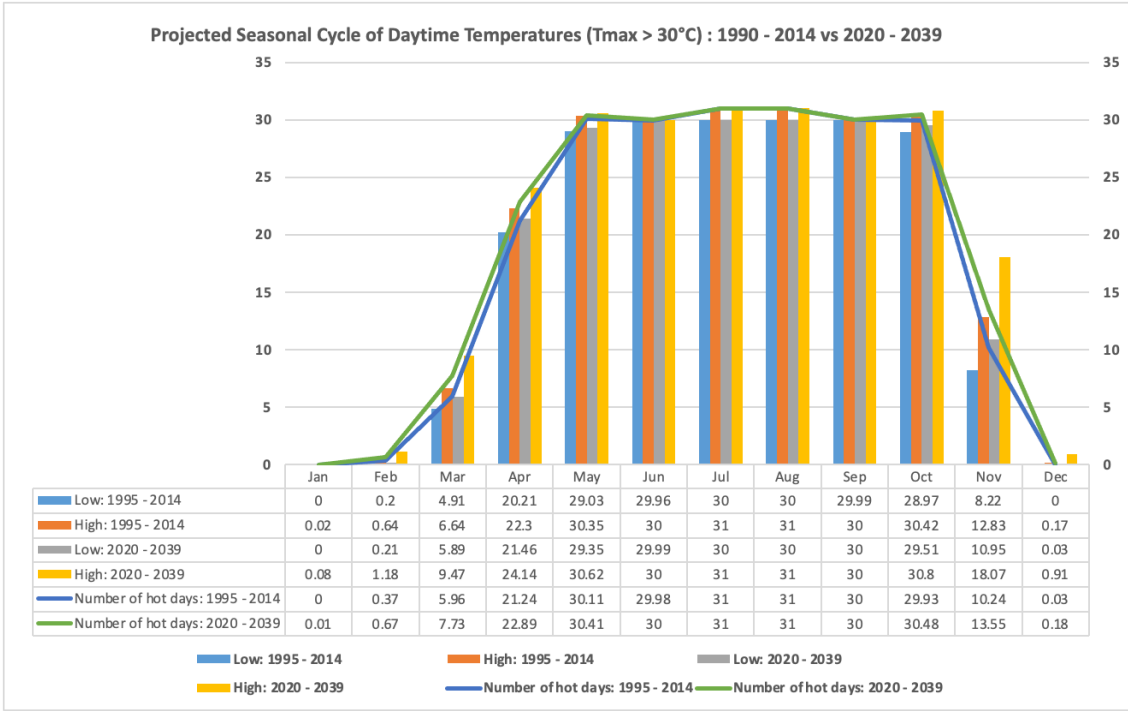
Source: World Bank, 2025

Figure 19 above shows a clear rise in heat-related risk across Qatar’s calendar year. From 1995 to 2014, heat stress affecting population health was concentrated between March and October, with peak intensity in the summer months. In the projected period from 2020 to 2039, the

number of high-risk months increases, with February, November, and December all shifting from minimal to moderate heat exposure. Risk levels during peak summer—May through September—also rise from moderate to high. This shift indicates a growing and longer heat season, with wider population exposure. It reinforces the urgent need for heat adaptation measures across sectors.

Qatar’s recent disaster trends have been notably influenced by the effects of climate change, manifesting in more frequent and severe natural hazards such as extreme heat, flash floods, water scarcity, and coastal flooding. The country has experienced a marked increase in average annual temperatures—rising by nearly 2°C from 1901 to 2021—which has intensified the frequency and duration of heatwaves. Climate change is also causing heatwaves to last longer, with recent studies showing that their duration has increased, exposing the population to extreme temperatures for extended periods and heightening health risks, especially in urban areas with pronounced heat island effects.

Figure 20: Projected Seasonal Cycle of Daytime Temperatures (Tmax > 30°C) : 1990 - 2014 vs 2020 - 2039



Source: World Bank, 2025

Figure 20 above shows a clear warming trend across all months in Qatar, with future projections (2020–2039) revealing higher daytime temperatures compared to the historical reference period (1995–2014). The increase is most pronounced in the cooler months—November, December, and February—where both low and high temperatures rise sharply. For example, November’s upper range climbs from 12.8°C to 18.1°C. Hot days, defined by extreme daytime heat thresholds (Maximum temperature > 30°C), also increase across the year. In March and April, the number of hot days rises by nearly two per month. Even in previously cooler months

like February and December, hot days begin to emerge. July and August remain at the maximum, with 31 hot days, indicating that nearly every day in summer will continue to exceed high-heat thresholds. This shift confirms a longer and more intense heat season, reinforcing the need for adaptive infrastructure, health preparedness, and public cooling strategies.

According to the World Bank, drought is one of Qatar's most persistent risks, linked to its arid climate and rising demand for water. The Think Hazard platform⁵ confirms that drought in Qatar is a high-level concern, with intense episodes occurring roughly every five years. While earthquakes are rare, tremors from the Zagros fault in Iran have occasionally been felt, such as the 2013 event near the Iran–Pakistan border. However, no physical damage has been reported within Qatar itself.

Rainfall in Qatar remains highly unpredictable and variable, but when it does occur, it often results in short, intense storms that trigger flash floods, as seen in the 2018 event that caused significant damage and displacement. These heavy rainfall episodes are typically followed by prolonged dry periods, exacerbating drought and water shortages. Climate change has also raised the risk of coastal floods; sea level rise projections indicate that even small increases could inundate significant portions of Qatar's coastal infrastructure and urban areas, threatening key economic assets and residential zones.

Additionally, sand and dust storms—driven by changing wind patterns and desertification—have become more frequent, further impacting air quality and public health. Overall, the interplay of rising temperatures, erratic precipitation, and sea level rise, all driven by climate change, is amplifying the scale and impact of natural disasters in Qatar, underscoring the country's heightened vulnerability to climate-related hazards.

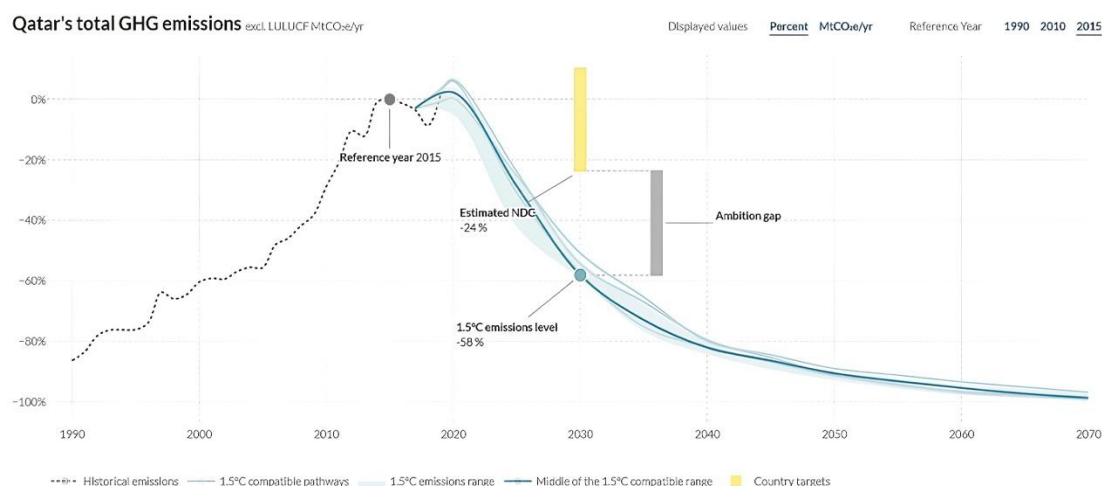
GHG Emissions and Economic Impacts

Qatar has the highest per capita greenhouse gas (GHG) emissions in the world⁶, primarily due to its heavy reliance on oil and gas production. In 2014, per capita CO₂ emissions were the highest globally, with total emissions reported at 106.02 million tonnes CO₂ equivalent in 2010 and 85.25 million tonnes in 2012—93% of which was carbon dioxide. The transportation sector alone contributes almost 14% of all GHG emissions, with private vehicles accounting for the vast majority. In essence, as reflected in Figure 21 below, Qatar's current greenhouse gas emissions are far above what is needed to limit warming to 1.5 °C. The data shows that to align with this target, Qatar must cut its emissions by more than half—about 58 percent down from 2015 levels—bringing them to roughly 81 million tonnes CO₂e by 2030. Meanwhile, Qatar's own climate pledge (its updated NDC) targets only a 25 percent reduction from a business-as-usual scenario, which leaves emissions at an estimated 147–213 MtCO₂e—well above the 1.5 °C-compatible range. The pathway vision extends to 2050, suggesting emissions must fall steeply—by around 90 percent below 2015 levels—to near 18–20 MtCO₂e, with any residual emissions addressed through negative-emission technologies.

⁵ Thinkhazard (2025). "Water Scarcity" Last retrieve 6/29/2025 <https://thinkhazard.org/en/report/201-qatar/DG?utm>

⁶ <https://www.worldeconomics.com/Thoughts/Qatar-is-by-Far-the-Largest-per-Capita-CO2-Polluter.aspx?>

Figure 21: Qatar's Greenhouse Emissions Pathway Compared to 1.5°C Compatibility Target



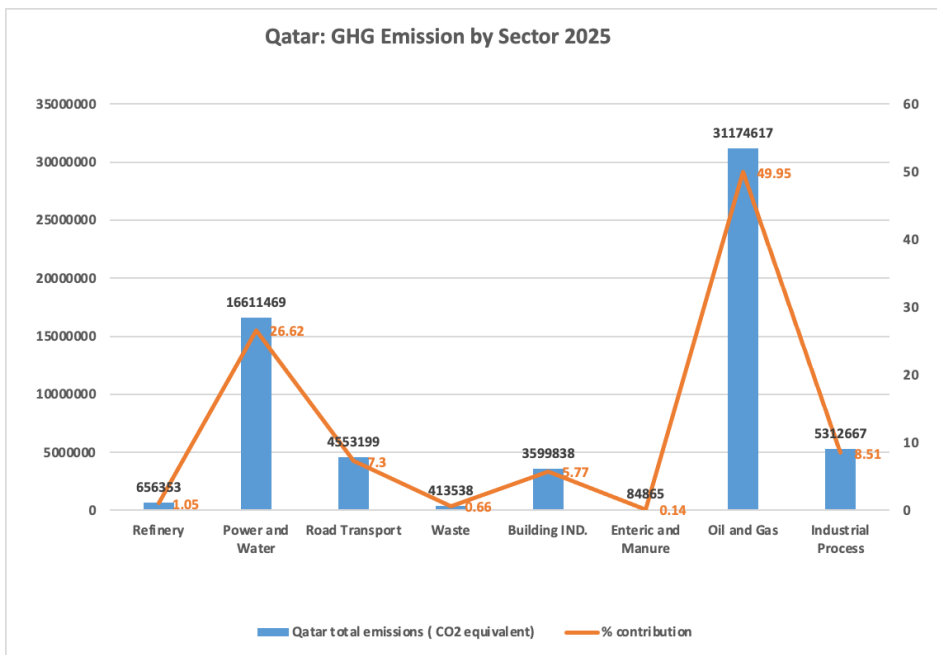
Source: Climate Analytics. (n.d.) 1.5°C national pathway explorer: Qatar. Retrieved June 29, 2025 [Link](#)

Economically, Qatar's dependence on hydrocarbons makes it vulnerable to both market fluctuations and climate-related disruptions. The climate crisis could cause a 31% decrease in national earnings, while increasing costs for water desalination and food imports due to extreme heat and water scarcity. Agriculture is minimal, accounting for about 0.29% of GDP, and over 90% of food is imported, heightening food security risks. Figure 22 below shows that nearly 75% of Qatar's total emissions in 2025 come from oil and gas production and power generation, with the oil and gas sector alone responsible for almost half of all emissions. Power and water infrastructure contribute over a quarter, driven by fossil-fuel-based electricity and desalination. Road transport, industrial processes, and building operations add smaller but still significant shares. Emissions from agriculture and waste remain negligible. This profile confirms that Qatar's emissions are structurally tied to fossil energy and urban systems, reinforcing the urgency for deep, sector-wide decarbonization.

Table 7: Qatar GHG Emissions and Economic Indicators

Indicator	Value/Year	Note
Total GHG Emissions	106.02 Mt (2010)	93% CO ₂ , 5% methane, rest N ₂ O/FGs
Per Capita GHG Emissions	14.7 tCO ₂ e (2012)	Highest globally
Transport GHG Share	~14%	99% from private vehicles
Oil & Gas Share of Exports	80%	70% of government revenues
Food Imports	>90%	High food insecurity risk

Figure 22: Qatar: GHG Emission by Sector 2025



Source: Qatar Open Data, 2025

Vulnerability and Resilience Profile

Qatar is classified among the countries with “extreme” vulnerability to sea level rise, with 18.2% of its territory and 13.7% of its population residing less than 5 meters above sea level. Projections suggest a rise between 0.55 to 0.98 meters by the year 2100, depending on various emissions scenarios. Over 97% of the population lives in dense coastal urban areas, increasing exposure to flooding and storm surges. Key infrastructure—including oil and gas facilities, power plants, and export terminals—are also located in these vulnerable zones.

Water scarcity is severe, with the country among the 17 most water-stressed globally, and a water stress level of 280%. Qatar has one of the highest rates of water consumption in the world, averaging around 500 liters per person per day. This staggering figure is largely supported by energy-intensive desalination processes, which puts a significant strain on both energy resources and water management strategies⁷. Migrant workers in Qatar are exposed to considerable health challenges related to extreme heat, particularly those working on outdoor construction sites. Research conducted by Equidem from 2021 to 2024 highlights instances where workers have experienced wet-bulb temperatures exceeding 45 °C during extended shifts, frequently with limited opportunities for hydration and rest. These conditions are well documented to increase risks of dehydration, heat-related illnesses, and serious health complications.

Despite these vulnerabilities, Qatar scores high on adaptation readiness, with robust infrastructure and financial capacity to implement resilience measures. The country’s National

⁷ <https://belonging.berkeley.edu/climatedisplacement/case-studies/qatar>

Environment and Climate Change Strategy (2021) outlines plans for emissions reduction, renewable energy adoption, and enhanced biodiversity.

- Water scarcity and desertification:

Rising temperatures in Qatar—driven by climate change—are intensifying both water scarcity and desertification. As temperatures increase, evaporation rates rise, leading to greater water loss from already limited freshwater sources such as aquifers and reservoirs. This exacerbates Qatar’s chronic water scarcity, which is further strained by erratic rainfall and prolonged dry periods. The country’s only renewable freshwater comes from fossil aquifers, which are being depleted faster due to increased demand and higher evaporation.

Higher temperatures also accelerate desertification. The increased frequency and intensity of droughts, combined with declining soil moisture and salinization of groundwater, degrade land quality and reduce agricultural productivity. This leads to further loss of arable land—already less than 2% of Qatar’s territory is suitable for agriculture—and increases reliance on food imports, heightening food security risks.

Additionally, environmental degradation is compounded by unsustainable groundwater extraction and the energy-intensive process of desalination, which itself contributes to greenhouse gas emissions and further climate warming. The combined effect of rising temperatures, water scarcity, and land degradation creates a feedback loop that threatens Qatar’s ecosystems, agriculture, and long-term sustainability.

- Agricultural productivity:

Increased heat in Qatar will have several direct and compounding negative impacts on agricultural productivity:

Shortened Growing Seasons and Increased Crop Failure: Higher temperatures will shorten the growing season for crops and increase the likelihood of crop failure. Extreme heat, especially when combined with drought, stresses plants, reduces yields, and can result in total crop loss for heat-sensitive varieties.

Reduced Livestock Productivity: Extreme heat also affects livestock, leading to heat stress, reduced feed intake, lower fertility, and higher mortality rates, which further diminishes agricultural output.

Increased Water Demand and Scarcity: As temperatures rise, crops require more water to survive, but Qatar already faces chronic water scarcity. This increased demand for irrigation is unsustainable given the country’s limited freshwater resources, further reducing the viability of agriculture.

Soil Degradation and Desertification: Persistent high temperatures accelerate soil moisture loss, increase salinization, and contribute to land degradation and desertification, making arable land even scarcer and less productive.

Food Security Risks: With over 90% of its food imported, any decline in domestic agricultural productivity increases Qatar’s vulnerability to external shocks and raises food security concerns.

In summary, rising heat will further constrain Qatar’s already limited agricultural sector by reducing yields, shortening growing seasons, stressing livestock, increasing water demand, and accelerating land degradation.

Physical and Transition Climate Risks

Physical Risks:

- **Extreme Heat:** Increasing frequency and intensity of heatwaves, with temperatures regularly exceeding 45°C as Qatar is classified as having a “high” hazard level for extreme heat, meaning events causing significant heat stress are expected at least once in five years
- **Coastal Flooding:** High risk due to low elevation, with a 1-meter sea level rise projected to affect 3% of land and a 3-meter rise up to 8%. Qatar is one of three Gulf nations with “extreme” vulnerability to sea-level rise, with 18.2% of its land and 13.7% of its population under 5 m elevation.
- **Water Scarcity:** Persistent, with declining groundwater and high dependence on desalination. Qatar is ranked among the top 17 most water-stressed countries, with a stress level of over 280%
- **Desertification:** Accelerated by poor irrigation and overuse of water resources. Soil salinization and expanding urban zones further reduce land viability

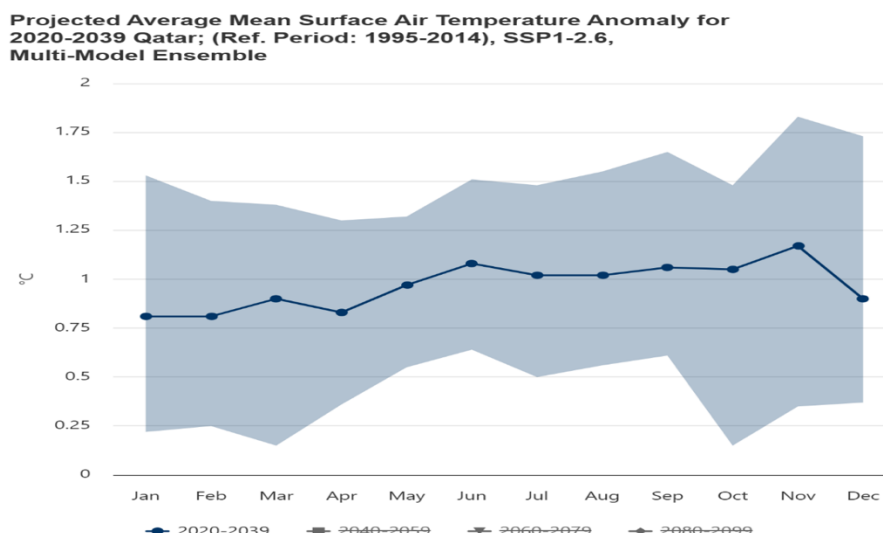
Transition Risks:

- **Economic Diversification Pressure:** Qatar is heavily dependent on hydrocarbons, with the oil and gas sector contributing roughly 60% of GDP and over 70% of government revenue. Heavy reliance on hydrocarbons exposes Qatar to global shifts toward decarbonization and clean energy.
- **Regulatory and Market Risks:** International climate policies and carbon pricing could impact export revenues and investment attractiveness.
- **Social Risks:** Migrant workers in Qatar are subject to heightened exposure to climate-related hazards, which presents important social considerations and potential reputational sensitivities. This disproportionate vulnerability underscores the need for continued attention to worker protections and climate resilience measures that support the health, safety, and wellbeing of all members of the labor force.

Climate Change Projections and Compound Risks

Projections indicate a significant rise in temperatures, with mean annual temperatures expected to increase by 2°C in the next 15–20 years and over 4°C by the end of the century. Rainfall is projected to remain low and erratic, increasing the risk of both drought and intense flash floods. Sea level rise poses a growing threat to coastal infrastructure and communities, with compound risks from simultaneous heatwaves, water scarcity, and flooding.

Figure 23: Projected Temperature Increase in Qatar



Source: World Bank, 2025

Figure 23 above shows how average monthly temperatures in Qatar are expected to rise between 2020 and 2039 when compared to the historical period of 1995 to 2014. The data is based on a low-emissions scenario (SSP1-2.6) and brings together results from several climate models. It confirms that Qatar will get warmer throughout the year, not just in summer but also during cooler months. On average, every month shows an increase of around 0.8°C to 1.2°C. The biggest rise is expected in November, where the temperature could increase by as much as 1.83°C in some models. Even traditionally cooler months like January and February show a clear upward trend. In summer, the warming continues steadily, with June, July, and August all showing over 1°C of increase. This shift means that Qatar's heat season will become longer and more intense. Warmer nights, hotter days, and fewer months of relief are likely to affect public health, infrastructure, and energy demand. These projections highlight the need for stronger climate adaptation—especially in building design, cooling systems, and worker protection—to manage the risks ahead.

Qatar faces high country risk from climate and natural disasters, driven by extreme heat, water scarcity, sea level rise, and high GHG emissions. While the country possesses strong financial and institutional capacity for adaptation, its economic structure, geographic vulnerability, and social inequalities pose significant challenges. Ongoing efforts to diversify the economy, enhance resilience, and reduce emissions will be critical in mitigating future risks.

3.1.2. Islamic Finance Landscape and the Potential for Climate Risk Mitigation and Natural Disasters Preparedness

Institutional Arrangement

Qatar has established itself as a global leader in Islamic finance, underpinned by a robust and evolving institutional and regulatory framework. Three different regulators oversee the financial sector. The Qatar Central Bank (QCB), the Qatar Financial Centre Regulatory Authority (QFCRA) and the Qatar Financial Market Authority (QFMA), which collectively oversee banking, insurance (Takaful), and capital markets. The QFCRA aligns its prudential regulations with

international standards, notably those set by the Basel Committee on Banking Supervision (BCBS) and the Islamic Financial Services Board (IFSB), ensuring soundness and transparency in the Islamic financial sector.

Key features include:

- Islamic Banking Business Prudential Rules (2015) and Banking Business Prudential Rules (2014), which set capital, liquidity, and risk management standards for Islamic banks.
- Ongoing regulatory updates: In 2025, QFCRA proposed amendments to market risk capital requirements, introducing scaling factors and limits on foreign currency exposures to further align with global best practices.
- Strong sectoral growth: By the end of 2024, Islamic finance assets in Qatar reached QR694 billion, with Islamic banking and Sukuk accounting for 97% of the total.

Appendix 2 provides an overview of Qatar's Islamic finance industry development.

Regulatory Landscape to Promote Green Finance

Qatar's regulatory landscape for green and sustainable finance has undergone significant transformation in recent years, culminating in the launch of comprehensive frameworks and guidelines that align with international best practices. This evolution is driven by the coordinated efforts of the Qatar Central Bank (QCB), the Qatar Financial Centre Regulatory Authority (QFCRA), the Ministry of Finance, and proactive initiatives by the financial industry. The following assessment provides a sectoral breakdown and evaluates the progress across key regulatory and institutional actors.

Banking Sector

The QCB's Sustainable Finance Framework, introduced in 2025, is a landmark regulatory initiative requiring all banks operating in Qatar to integrate sustainability into their credit and investment activities. The framework defines sustainable finance broadly, encompassing both conventional and Islamic-compliant instruments, and sets out clear principles for sustainable and sustainability-linked finance. It mandates that banks direct credit and investments toward projects with environmental and social benefits, such as renewable energy, clean transportation, and affordable housing. The framework also introduces sustainability-linked credits, where loan terms are contingent on achieving predefined sustainability performance targets, and requires rigorous evaluation, reporting, and verification processes. Non-compliance is subject to penalties under QCB law, reinforcing the seriousness of the regulatory mandate.

Capital Markets

The Sustainable Finance Framework extends to capital market participants, providing guidelines for the issuance of green bonds, sukuk, and other sustainable financial products. The framework aims to mobilize capital towards environmentally and socially responsible projects, enhancing transparency and accountability in the use of proceeds. It also aligns with the ESG and Sustainability Strategy for the Financial Sector and Qatar National Vision 2030, facilitating the development of a robust market for sustainable securities. Moreover, the Qatar Financial Centre (QFC) introduced the Sustainable Sukuk and Bonds Framework in 2022, designed to facilitate the issuance of green, social, and sustainability bonds and sukuk based on internationally recognized standards. This regulatory clarity is expected to stimulate innovation and attract both domestic and international investors seeking green investment opportunities.

Insurance Sector

While the insurance sector is included in the broader scope of the QCB's Sustainable Finance Framework, specific regulations for green insurance products are still emerging. The framework encourages insurance companies to develop and offer products that support sustainable risk management and resilience, such as coverage for renewable energy projects and climate-related risks. Enhanced reporting and transparency requirements are designed to ensure that the insurance sector contributes meaningfully to the national sustainability agenda.

Significant progress in Qatar's sustainable finance landscape has been achieved through collaborative efforts involving the Qatar Central Bank (QCB), the Qatar Financial Centre Regulatory Authority (QFCRA), the Ministry of Finance, and proactive initiatives by the financial industry.

3.1.3. Islamic Financing Provisions for Climate Risk Mitigation and Natural Disasters Preparedness: Institutions, Products, and Offerings

Qatar has made significant strides in developing Islamic financing provisions aimed at climate risk mitigation and natural disaster preparedness, supported by a growing suite of green and sustainable finance products, sukuk issuances, and regulatory frameworks. These initiatives are aligned with Qatar's National Vision 2030 and the Third Financial Sector Strategic Plan, reflecting a strong national commitment to sustainable economic development within an Islamic finance context.

Institutions and Regulatory Frameworks

A key milestone is the Qatar Central Bank's (QCB) Sustainable Finance Framework launched in April 2025, which establishes a comprehensive regulatory foundation for sustainable finance across the banking, capital markets, and insurance sectors. This framework mandates enhanced transparency, rigorous reporting, and external audits for sustainability-linked financial products. It explicitly incorporates sustainable Islamic financial instruments, supporting Qatar's transition to a resilient and inclusive green economy. The framework promotes green financing and sustainability-linked lending, requiring banks and financial institutions to channel funds towards projects that contribute to environmental and social benefits, including climate risk mitigation and disaster preparedness.

Islamic Banking: Products and Offerings

Qatar Islamic Bank (QIB), the largest Islamic bank in Qatar, exemplifies the integration of sustainability into Islamic finance. QIB's Sustainable Products Framework explicitly supports investments and financing that contribute to national sustainable growth and the green economy transition. The bank offers a broad range of green financing products, including sustainable mortgages, project financing aligned with ESG principles, and the Absolute Mudaraba "Sustainable Deposit" launched in January 2024. QIB's recent partnership with the Gulf Organisation for Research and Development (GORD) further advances sustainable real estate financing and the promotion of green buildings certified by the Global Sustainability Assessment System (GSAS), reinforcing its proactive approach toward climate change mitigation and green infrastructure development.

Across Qatar's financial sector, the sustainable product landscape has rapidly expanded. Major institutions now offer green bonds—such as Commercial Bank's CHF-denominated Green Bond and the Qatari government's USD 2.5 billion sovereign green bonds—directing capital to renewable energy, eco-friendly real estate, and sustainable infrastructure projects. Green loans

are available from QNB (including electric vehicle loans, green mortgages for GSAS-certified homes, and green repurchase agreements), while Commercial Bank and Dukhan Bank also provide green mortgage and real estate financing. The sector has introduced innovative Sharia-compliant products, such as Masraf Al Rayan's Green Deposit and QInvest's USD 275 million sustainability-linked Murabaha facility, alongside QIIB's Sustainable Finance Framework, which enables green and social Sukuk issuances.

To further support sustainable investment, Al Rayan's ESG-aligned ETF tracks the QE Islamic Index, and green vehicle financing is widely accessible through QNB, QIIB, and Commercial Bank, promoting the adoption of electric and hybrid vehicles. These offerings are underpinned by national policy: the Qatar Central Bank's Sustainable Finance Framework, issued in 2025, formalizes ESG requirements for all banks and accelerates the sector's alignment with Qatar National Vision 2030 and the National Climate Change Action Plan.

Moreover, QIB has embedded sustainability into its governance and operational structures, ensuring compliance with Shariah and international banking standards while supporting environmental and social objectives. The bank's leadership in sustainable Islamic finance is reflected in its financial performance and innovation awards, including recognition as the Best Islamic Bank in Qatar and the Most Innovative Bank in the Middle East in 2025. QIB's financing portfolio includes substantial investments in sectors that mitigate climate risks and promote sustainability, demonstrating a practical commitment to green finance within an Islamic framework and contributing to Qatar's position as a regional leader in sustainable finance.

Capital Markets: Green Sukuk and Bonds

Qatar's capital markets have seen a growing issuance of green and sustainable sukuk, which are Shariah-compliant Islamic bonds designed to finance environmentally beneficial projects. While specific sukuk issuances dedicated solely to green projects are emerging, the regulatory environment fostered by the QCB's Sustainable Finance Framework encourages the development of such instruments. The framework's alignment with Qatar's ESG and Sustainability Strategy facilitates the mobilization of capital through sukuk for climate risk mitigation, renewable energy, and infrastructure resilience projects.

The Qatar Islamic Finance Report 2025 highlights that Islamic banking and sukuk together constitute 97% of Qatar's Islamic finance assets, underscoring the critical role sukuk play in sustainable finance. The regulatory clarity and market incentives provided by the QCB and Qatar Financial Centre are expected to accelerate the growth of green sukuk issuances, attracting both regional and international investors focused on sustainability.

Insurance Sector: Emerging Green Takaful Products

Although still nascent compared to banking and capital markets, the insurance sector in Qatar is beginning to incorporate sustainability considerations into its offerings. The QCB framework encourages takaful (Islamic insurance) companies to develop products that address climate-related risks and support disaster preparedness. These include coverage for renewable energy projects and climate resilience initiatives, contributing to risk mitigation aligned with Islamic principles.

Summary and Outlook

Qatar's Islamic finance industry is increasingly embedding climate risk mitigation and natural disaster preparedness into its products and regulatory frameworks. The QCB Sustainable Finance Framework is a pivotal regulatory instrument that integrates sustainability into Islamic banking, capital markets, and insurance, fostering innovation and accountability. Leading

Islamic banks like QIB are operationalizing these principles through sustainable financing products and governance structures aligned with Shariah and ESG standards.

The growth of green sukuk and sustainable bonds is poised to mobilize significant capital towards Qatar's environmental and social priorities, while the insurance sector's gradual adoption of green takaful products complements these efforts. Collectively, these developments position Qatar as a regional leader in Islamic green finance, supporting its broader economic diversification and sustainability goals.

3.1.4. Incentive Mechanisms to Develop Islamic Financing Responses

Qatar has established a robust set of incentive mechanisms—fiscal, macroprudential, and microprudential—to foster the development of Islamic green and sustainable financing. These mechanisms are embedded within the country's strategic financial sector plans and operationalized through regulatory frameworks, product innovation, and supportive infrastructure.

Fiscal Incentives

Qatar's fiscal environment is characterized by competitive tax policies and government-backed initiatives that encourage sustainable investment. The government, through the Qatar Fund for Development and national strategies, supports projects aligned with sustainable development and climate resilience. While direct green tax credits or subsidies specific to Islamic finance are not widely reported, the overall low-tax regime and public investment in green infrastructure create a favorable backdrop for Islamic banks and issuers to offer green products. Additionally, government-led sustainable development projects often provide anchor demand for green sukuk and Islamic financing, indirectly incentivizing financial institutions to expand their green offerings.

Macroprudential Incentives

At the macroprudential level, the Qatar Central Bank (QCB) has embedded sustainability into its regulatory oversight. The QCB Sustainable Finance Framework (2025) requires banks—including Islamic banks—to integrate environmental, social, and governance (ESG) factors into their credit and investment decisions. This framework encourages the allocation of capital toward green projects by:

- Mandating sustainability-linked lending and investment practices.
- Requiring banks to report on their green finance activities and exposures.
- Introducing sustainability-linked credits, where loan terms are tied to the achievement of predefined environmental or social targets.

These requirements create a system-wide incentive for Islamic financial institutions to prioritize green assets, as compliance is monitored and non-compliance may result in regulatory penalties.

Microprudential Incentives

On the microprudential front, the QCB and the Qatar Financial Centre Regulatory Authority (QFCRA) have issued detailed guidelines for sustainability risk management and disclosure. Banks must conduct rigorous due diligence on green projects, adhere to Shariah and ESG standards, and provide transparent reporting on the environmental impact of their financing activities. The introduction of green savings accounts and other sustainable deposit products—offering incentives to customers for participating in green finance—further encourages retail and institutional engagement in sustainable Islamic finance.

Product-Level and Market Incentives

Qatar’s Islamic banks, notably Qatar Islamic Bank (QIB), have launched frameworks and products that support green and sustainable finance, including:

- Green savings accounts that reward customers for supporting sustainable projects.
- Sustainability-linked loans and project finance for renewable energy, clean transportation, and other climate-resilient sectors.
- Green and sustainable sukuk issuances, with the regulatory environment favoring such products through clear guidelines and reporting standards.

The QCB framework also supports innovation by allowing for the development of new Shariah-compliant green financial products, further incentivizing banks to expand their sustainable finance portfolios.

Assessment

Qatar’s incentive mechanisms for Islamic green and sustainable finance are comprehensive and multi-layered. The fiscal regime provides a supportive macroeconomic context, while macroprudential and microprudential regulations directly encourage financial institutions to integrate sustainability into their operations. Product-level incentives, such as green savings accounts and sustainability-linked lending, translate these policies into tangible offerings for customers and investors. Collectively, these mechanisms have positioned Qatar as a regional leader in Islamic sustainable finance and are expected to drive further growth in green sukuk issuances and innovative Shariah-compliant products.

3.1.5. Best Practices: Lessons Learned

Qatar’s progress in Islamic green and sustainable financing offers a compelling model of how a country can mobilize green investments while enhancing climate resilience within its financial system. The nation’s approach is characterized by a strong regulatory foundation, clear taxonomies, macroprudential policy innovation, and a commitment to transparency and best practices.

Ecosystem for Sustainable/Green Finance in Qatar

Qatar’s sustainable finance ecosystem is anchored by a collaborative effort between regulators, financial institutions, and policymakers. The Qatar Central Bank (QCB) has played a pivotal role with the launch of its Sustainable Finance Framework in 2025, which formalizes ESG-aligned finance and requires all banks—including Islamic banks—to direct funding toward green and socially responsible projects. This framework is closely aligned with the Qatar National Vision 2030 and is complemented by ongoing modernization efforts in the financial industry to meet international standards and best practices. Qatar Islamic Bank (QIB) and other leading

institutions have demonstrated innovation and growth in sustainable Islamic banking, underlining the private sector's commitment to the green transition.

Taxonomies and Regulation on Green/Sustainable Bonds and Sukuk

While Qatar does not yet have a unified or dedicated national taxonomy for sustainable finance as of 2025, the country has made notable progress toward aligning with international practices through regulatory frameworks and guidance. The QCB Sustainable Finance Framework defines sustainable finance to include any credit facility or financial instrument—conventional or Islamic, such as bonds and sukuk—used to fund eligible green, social, or sustainable projects. The framework provides principles and definitions that bring consistency to how banks and issuers structure, evaluate, and report on green and sustainability-linked bonds and sukuk. The Qatar Financial Centre (QFC) also introduced the Sustainable Sukuk and Bonds Framework in 2022, designed to facilitate the issuance of green, social, and sustainability bonds and sukuk based on internationally recognized standards. The framework is aligned with the International Capital Markets Association (ICMA)'s Green Bond Principles (GBP), Social Bond Principles (SBP), and Sustainability Bond Guidelines (SBG) from 2021, harmonizing global best practices with local market needs. This regulatory clarity is essential for attracting both local and international investors and for ensuring that financing is channeled to projects with genuine environmental and social impact.

Green Macroprudential Policies

Qatar's macroprudential approach to green finance is evident in the requirements imposed by the QCB framework. Banks must integrate sustainability considerations into their lending and investment decisions, with sustainability-linked financing terms that vary based on the achievement of defined environmental or social targets. This approach incentivizes financial institutions to prioritize green projects and supports the resilience of the financial sector by aligning credit risk assessments with climate and sustainability risks. The framework also introduces mandatory impact evaluation, reporting, and third-party verification, ensuring that green finance activities are both effective and accountable.

Initiatives Promoting Transparent Green/Sustainability Reporting

Transparency and accountability are cornerstones of Qatar's sustainable finance agenda. The QCB Sustainable Finance Framework requires financial institutions to adopt clear procedures for impact evaluation, reporting, and external verification of sustainable finance activities. This is reinforced by national reforms in public sector sustainability reporting and the adoption of international standards for disclosure. Such requirements not only enhance investor confidence but also ensure that the environmental and social outcomes of green finance are measurable and credible.

Key Lessons and Best Practices

- **Integration of Islamic Finance and Sustainability:** Qatar's regulatory framework explicitly integrates Islamic finance with sustainability criteria, leveraging Shariah-compliant instruments as a core part of the country's sustainable development strategy.
- **Macroprudential Innovation:** Linking credit terms to sustainability performance targets aligns financial sector incentives with national climate goals, supporting both investment mobilization and systemic resilience.
- **Commitment to Transparency:** Mandatory impact reporting and third-party verification are best practices that ensure accountability and build trust in the market.

- **Ecosystem Collaboration:** Strong coordination between regulators, financial institutions, and policymakers has created a supportive environment for sustainable finance innovation and growth.

Qatar's experience demonstrates that balancing green investment mobilization with climate resilience requires a holistic approach—clear regulation, robust taxonomies, macroprudential incentives, and unwavering transparency. These best practices position Qatar as a regional leader in Islamic green finance and offer a replicable model for other jurisdictions.

3.1.6. Country-Specific Policy Recommendations

Qatar's advanced institutionalization of Islamic finance, combined with its evolving climate and disaster risk profile, positions the country to lead in integrating climate adaptation and mitigation into financial policy and practice. As Qatar faces acute risks such as extreme heat, water scarcity, and rising sea levels, its climate strategy is rooted in sector-specific, pragmatic action rather than broad net-zero pledges. The following policy recommendations are designed to scale up Islamic green and sustainable financing, unlocking further potential while supporting the country's climate resilience and sustainable growth.

Drawing on Qatar's climate and disaster risk profile and the advanced institutionalization of Islamic finance, the following policy recommendations are tailored to leverage Islamic finance for climate risk mitigation and natural disaster preparedness:

Integrate Climate Adaptation and Mitigation into Islamic Finance Strategies

Qatar should embed climate adaptation and mitigation as core objectives within its national Islamic finance strategies. This means aligning Islamic finance policies with the Qatar National Adaptation Plan (NAP) and the National Environment and Climate Change Strategy (NECCS), ensuring that financial flows support the country's adaptation and mitigation targets. Islamic financial institutions (IFIs) should be mandated to assess and disclose climate-related risks in their portfolios using standardized frameworks and sector-specific benchmarks. This will enhance transparency, enable better risk management, and ensure that Islamic finance actively contributes to national climate goals.

Develop and Incentivize Green and Resilience-Linked Islamic Financial Products

To address climate risk and support resilience, Qatar should promote the issuance of Green Sukuk and Sustainability-Linked Sukuk dedicated to financing renewable energy, water conservation, sustainable infrastructure, and disaster-resilient projects. The government and regulators can incentivize such issuances through tax breaks, reduced fees, or guarantees. The Takaful (Islamic insurance) sector should be encouraged to develop products that cover climate-related risks and natural disasters, with premium incentives for policyholders who adopt risk reduction measures. Additionally, Shariah-compliant green investment funds and microfinance platforms should target climate adaptation in vulnerable sectors such as agriculture, water, and coastal infrastructure, enabling broader participation and impact.

Enhance Regulatory and Supervisory Frameworks for Sustainable Finance

Qatar's regulatory authorities should update prudential regulations to provide preferential capital treatment for green and climate-resilient assets held by Islamic banks and Takaful operators. This could include lower reserve requirements or risk weights for qualifying assets. Climate risk assessments and scenario analysis should become mandatory components of IFIs' risk management and reporting, in line with international best practices. Developing a national taxonomy for green and sustainable Islamic finance will clarify eligible activities and assets,

guiding product development and investment, and ensuring alignment with both Shariah and climate objectives.

Foster Public-Private Partnerships and Cross-Sectoral Collaboration

A unified approach to climate resilience requires platforms for collaboration between government, IFIs, the private sector, and international organizations. Such platforms can co-finance large-scale adaptation and disaster resilience projects, pool expertise, and share risk. Joint research and innovation hubs should be established to develop new Islamic financial instruments tailored to Qatar's unique climate risks and adaptation needs, building on the country's strengths in both finance and technology.

Implement Fiscal, Macroprudential, and Microprudential Incentives

Qatar should offer targeted fiscal incentives, such as tax exemptions or reductions for green Sukuk issuers and investors, and government guarantees for climate-resilient infrastructure projects financed through Islamic instruments. Macroprudential incentives—like lower reserve requirements for green portfolios—will encourage greater capital allocation to climate-aligned investments. At the micro level, incentives such as reduced Takaful premiums or subsidized financing for SMEs and households investing in adaptation and disaster preparedness can drive participation at the grassroots level.

Build Capacity and Raise Awareness

Capacity-building programs should be launched for Islamic finance professionals, focusing on climate risk assessment, green product structuring, and sustainable investment. Public awareness campaigns are also essential, highlighting the role of Islamic finance in building climate resilience and supporting sustainable development. These efforts will ensure that all stakeholders are equipped to contribute to and benefit from the green finance transition.

Monitor, Evaluate, and Report Impact

Robust monitoring and evaluation frameworks are needed to track the environmental and social impact of Islamic finance interventions in climate risk mitigation and disaster preparedness. IFIs should be required to report transparently on the use of proceeds, project outcomes, and alignment with national climate goals. This will build trust, attract investors, and ensure that green finance delivers real-world benefits. By integrating climate goals into Islamic finance policy, incentivizing green product innovation, strengthening regulatory frameworks, and fostering collaboration, Qatar can unlock the full potential of Islamic green finance. These measures will not only mobilize investment for climate adaptation and mitigation but also enhance the country's resilience, support sustainable development, and reinforce Qatar's leadership in Islamic sustainable finance.

Appendix 4 summarizes the policy recommendations and the corresponding responsible stakeholders.

3.3. CASE STUDY: NIGERIA

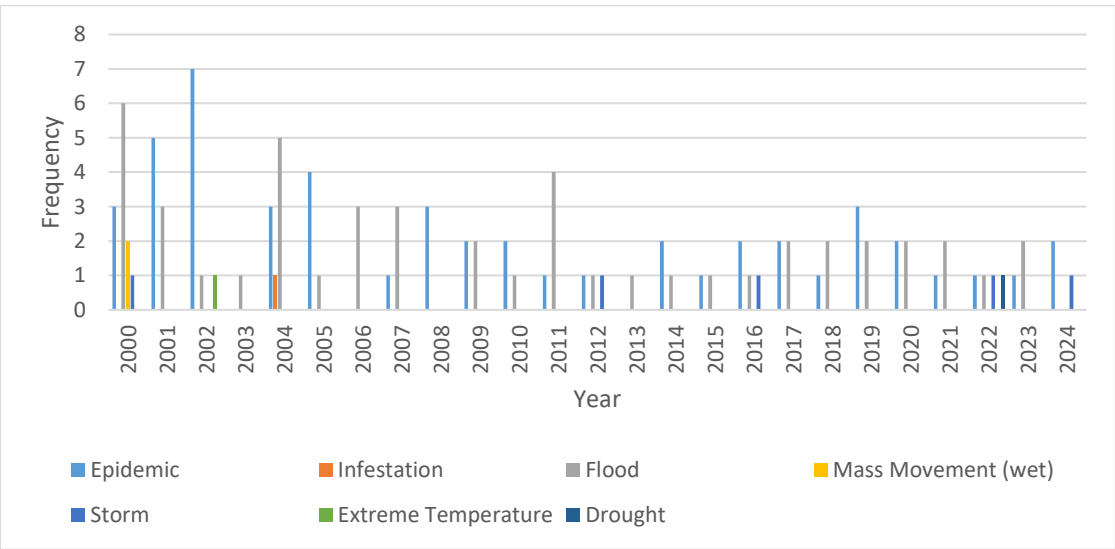
3.3.1. Assessing the Country Risk for Climate and Natural Disasters

Recent Disaster Trends

Nigeria is an emerging economy in sub-Saharan West Africa. With a projected population of 217 million as at 2022 (NBS (2023)), it is the most populous country on the African continent and has a land area of 923,768 square kilometers (km²) which includes 853 km of coastline.

Nigeria faces an increasing exposure to climate risk. According to ND-GAIN Index, Nigeria is ranked severely vulnerable to climate induced disasters among the OIC countries. Between 2000 and 2025, Nigeria has experienced devastating natural disasters, particularly flooding, epidemic and drought, which had claimed numerous lives, displaced large populations, and caused significant damage to infrastructure and agriculture (GHO, 2025). The trend of the natural disaster in Nigeria over a 25-year period is depicted in Figure 24 below.

Figure 24: Number of Natural Disasters in Nigeria between 2000 – May 2025



Source: EM DAT (2025)

From Figure 24 above, Epidemic and Flood were the most prevalent natural disasters during the 25-year period while storm, mass movement (wet), drought and extreme temperatures were less frequent. From table 3.1 below, flood was the most devastating natural disaster within the period having impacted over 16 million of the population. Epidemic, though the frequency of occurrence was high, the impact on the population was low as it affected only 406,921 people. Conversely, drought which had a very low frequency of occurrence had the highest impact on the population having impacted over 19 million people.

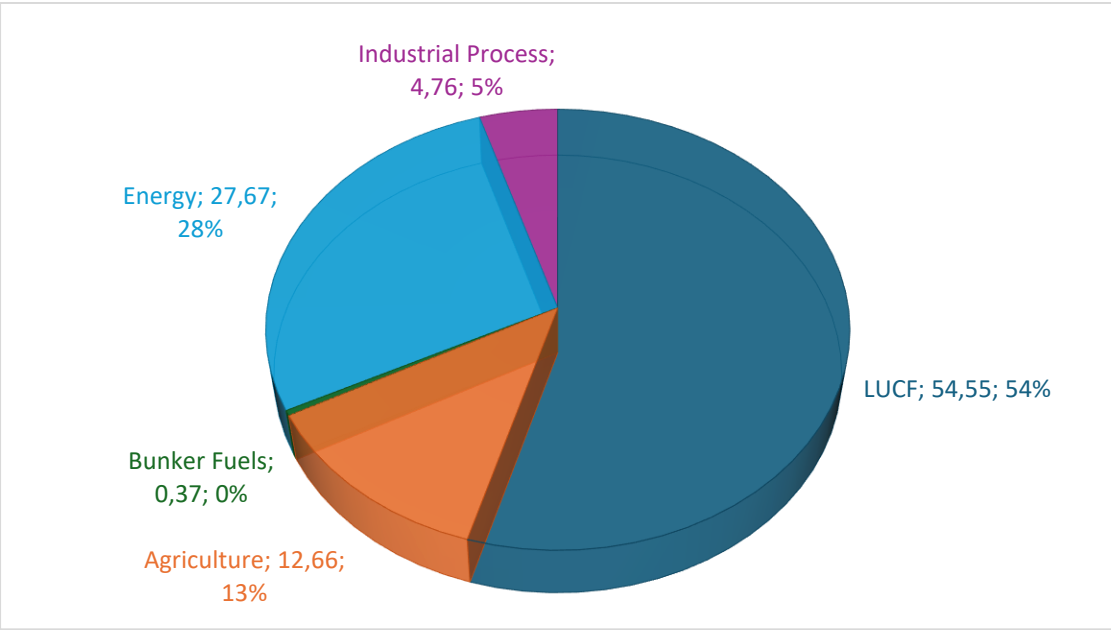
In order to better appreciate the severity of climate change induced natural disasters in Nigeria, relevant officers of the National Emergency Management Agency (NEMA) were interviewed and

the outcome revealed that there was a strong link between prevalent disasters and climate change phenomena.

GHG Emissions and Economic Impacts

In 2022, Nigeria was the world’s **25th** largest producer of greenhouse gas emissions as it produced **0.71%** of global greenhouse gas emissions. The total greenhouse gas (GHG) emissions by Nigeria in 2022 reached 356.48 MtCO2e including emissions from Land Use Change and Forestry (LUCF) (Climatewatchdata (2024)). Excluding LUCF, emissions were around 310.22 MtCO2e. The LUCF remains the dominant source of emissions, followed by energy, agriculture, industrial processes and Bunker Fuels as depicted in Figure 25 below.

Figure 25: Distribution of GHG Emissions by Sector in Nigeria (2022)



Source: Emission Index (2025)

The economic impact of climate change is quite huge. According to USAID, the agricultural sector, which accounts for around 25.18% of GDP and covers 70.8 million hectares of farmland, was severely affected by drought, flooding and soil degradation, leading to lower yields of staple crops such as maize, cassava, millet and rice. Additionally, the electricity sector was also affected. The total value of damage to the sector from the 2012 floods, among the worst on record, was estimated at EUR 4.7m.

This potential climate-related risk calls for action. It is in this regard that Nigeria's updated Nationally Determined Contribution (NDC) has unconditionally pledged a 20% emissions reduction below Business as Usual (BaU) by 2030, and a 47% conditional commitment which can be achieved with financial assistance, technology transfer and capacity building from the more advanced and more willing international partners (FME 2021)). Achieving these NDC targets will require transformative investments in the energy, agriculture and forestry sectors of the Nigerian economy.

According to the Federal Government of Nigeria, the estimated investment required over the 10-year implementation period (2021-2030) to deliver the conditional target is about \$177 billion,

giving a yearly average of \$17.7 billion. However, according to the Climate Policy Initiative, in 2019/2020, approximately USD 1.9 billion per year of public and private funds were invested in climate-related activities in Nigeria, representing only 11% of the USD 17.7 billion needed each year to meet the NDC conditional target. Thus there is a huge financing gap that needs to be addressed through both domestic and international financing channels.

Domestically, to mobilize the required NDC investments, it is crucial to engage the capital market. Increased private sector investment for NDC-aligned projects and businesses, requires further changes to the enabling environment, and appropriate blended finance modalities that allow concessional finance to de-risk private investment. In 2017, Nigeria participated in the inaugural international Climate Finance accelerator (CFa), and subsequently held a national CFa workshop and green finance mapping in order to encourage private sector participation (FME, 2021).

Nigeria has also received some funding assurances from the international community when the European Union in 2022 pledged EUR 1.3 billion in funding over five years to help Nigeria develop low-carbon resources and strengthen its climate resilience. (CPI, 2022).

Vulnerability and Resilience Profile

Nigeria is highly vulnerable to climate change and it faces significant challenges from increased temperatures, altered rainfall patterns, and rising sea levels, impacting its agriculture, water resources, and overall economic stability (CPI, 2022). Nigeria is one of the most vulnerable countries in the world.

The country ranks 152nd out of 187 in the ND-GAIN 2022 index, which assesses vulnerability and resilience to climate change. According to the World Bank, around 78% of Nigeria's land area is devoted to agriculture, the majority of which is rain-fed (with less than 1% irrigated) and carried out by small-scale farmers using traditional methods. In addition, its varied geography exposes it to many extreme weather phenomena.

The Government of Nigeria has responded to the adverse impacts of climate change in many ways. At the international level, Nigeria is a party to the United Nations Framework Convention on Climate Change (UNFCCC, 1992), and a signatory to both the Kyoto Protocol and the Paris Agreement. Furthermore, Nigeria subscribes to other key international agreements such as the Sendai Framework for Disaster Risk Reduction (UNDRR, 2015) and the United Nations Sustainable Development Goals (SDGs) for accelerated national development (FME, 2020). At the national level, the country has a plethora of policy instruments on climate change and other aspects of the environment such as the Nationally Determined Contribution (NDC), the National Adaptation Plan (NAP) Framework, the National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN), the Nigeria Climate Change Policy Response and Strategy (NCCPRS), the Nigeria Climate Change Act (CCA) 2021, the National Climate Change Policy for Nigeria 2021 – 2030, and the National Action Plan on Gender and Climate Change for Nigeria (NAPGCC). These policy frameworks provide a robust approach and structure for mainstreaming adaptation across all spheres of governance (Okeke (2023)). This is further corroborated by the interview conducted with the staff of NEMA where it was revealed that Nigeria has a coordinated action to address climate risks and natural disasters at the national level. The government had established NEMA as the focal agency for the reporting of disaster damage and losses across Ministries, Departments & Agencies (MDAs) and Sectors into the Sendai framework monitoring online platform. NEMA has also substantially improved its partnership with the Ministry of Environment, the National Climate Change Commission, the UNDRR and several other national and international organizations on climate change adaptation

in line with Paris Agreement to build resilience of communities and contribute to carbon emission reduction globally.

On the private-side, Nigeria has a Climate Finance Accelerator (CFA) initiative which aims to develop the pipeline for, and scale private investment into, NDC-aligned projects while enhancing local capacity to access climate finance (Ricardo, 2019). Similar to the CFA, the Nigeria Climate Innovation Center, set up in 2018 by the World Bank and the Federal Government, also works to develop and deploy solutions to climate change by providing venture-development and capacity-building support for viable green businesses across the renewable energy, waste management, water and agricultural sectors. Thus far, incubated businesses have raised over USD 1 million, with several businesses therein led by women (Nigeria CIC, 2022)

Physical and Transition Climate Risks

Nigeria is highly vulnerable to both physical and transition climate risks. Physical risks include increasing temperatures, rainfall variability, rising sea levels, and extreme weather events like floods, droughts, and desertification. Transition risks arise from the need to shift away from a hydrocarbon-dependent economy and adapt to changing climate conditions.

Nigeria is currently dealing with a wide range of environmental challenges, some of which are exacerbated by climate change, and negatively affects every sector, particularly agriculture, water resources and infrastructure. Other challenges facing the country are deforestation and de-vegetation, causing biodiversity loss and land degradation; floods, erosion, drought and desertification which are degrading the environment (World Bank, 2021). According to World Bank projections for a very high emissions scenario, Nigeria is likely to experience a significant rise in temperatures, reaching between 2.9°C and 5.7°C by 2100 (Tresor (2024)).

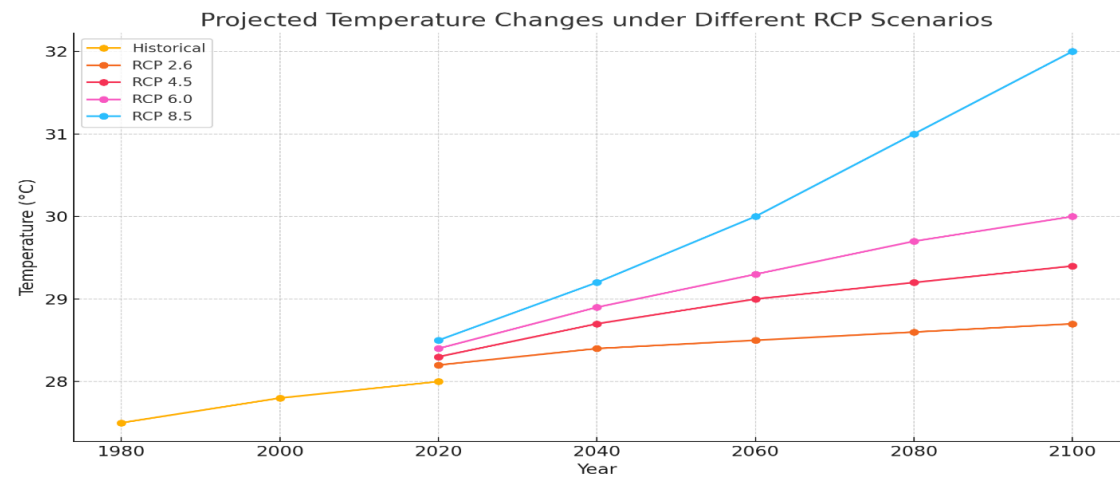
In addition to the physical climate risks highlighted above, Nigeria also faces transition climate risks. The Nigerian economy remains heavily dependent on fossil fuels as reflected in the country's infrastructure, vehicle fleet and industry. In 2023, crude oil accounted for 80.64% of Nigeria's total exports, though its contribution to GDP is limited to 5.40% (NBS 2024). In terms of energy production, according to the International Energy Agency (IEA), hydrocarbons dominate, accounting for 98.6% of the energy mix in 2021 and of these sources, biofuels and waste account for the 74.5%, followed by oil at 14% and natural gas at 10.1%. In addition, CO₂ emissions continue to rise, reaching around 101 MT in 2022 compared with 44 MT in 2000, an increase of 128% (IEA, 2023).

The challenges of transitioning to a sustainable economy in Nigeria are numerous and costly. The reforms needed to modernize infrastructure and convert traditional sectors will entail significant costs. Estimates predict that USD 1.9 trillion will be needed to achieve a complete transition by 2060, a target set in the Energy Transition Plan (ETP) launched in 2021 (CPI (2022)).

Climate Change Projections and Compound Risks

Across all emission scenarios, temperature increases for Nigeria are projected throughout the end of the century. As depicted in Figure 26 below, under a high-emission scenario, average temperatures are expected to increase rapidly by mid-century to the end of the century. Increased heat and extreme heat conditions will result in significant implications for human and animal health, agriculture, and ecosystems.

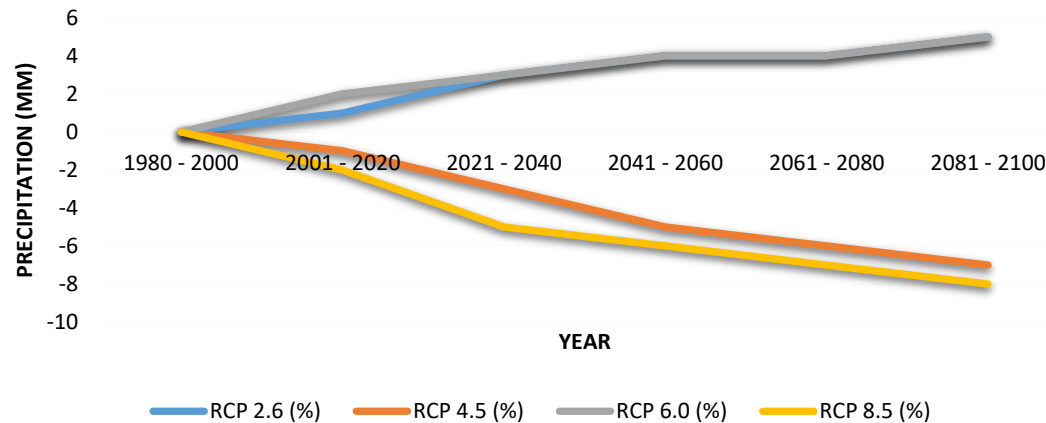
Figure 26: Projected Average Temperature for Nigeria (Reference Period, 1986–2005)



Source: World Bank CCKP (2021)

Rainfall projection for Nigeria is highly variable and analysis indicates no clear trend in precipitation. This is depicted in Figure 27 below.

Figure 27: Projected Average Precipitation in Nigeria between 2000 and 2100 (baseline, 1986-2005)



Source: WB CCKP (2021)

Figure 27 shows the change in projected annual average precipitation for Nigeria. Under RCP 2.6 and RCP 6.0, annual average precipitation is expected to remain similar to historical observations, but under the highest emissions scenario, RCP8.5, precipitation will decrease most drastically. However, across the country, rainfall is expected to decrease significantly in the northern areas and increase in the south and along the coast (WB CCKP, 2021).

To mitigate these adverse projected climate change effects, adaptation strategies to build resilience in Nigeria needs to be put in place. It is in this regards that Nigeria has developed the right policies, strategies, and action plans to achieve its adaptation priorities. Adaptation issues

are addressed using a sectoral approach. The key sectors given prominence include energy, agriculture, water resources, forestry and wildlife, education, health, security, and transportation (FRN, 2021).

3.3.2. The Trajectory of Islamic Finance: Institutionalization, Legal and Regulatory Framework, and Financial Standing with Particular Reference to Climate Risk Mitigation and Natural Disasters Preparedness

Institutional Arrangement

Nigeria has established a robust institutional architecture to safeguard financial stability, ensuring effective coordination among key financial authorities. The institutions in the financial sector are regulated by the Central Bank of Nigeria (CBN), Federal Ministry of Finance, Nigeria Deposit Insurance Corporation (NDIC), Securities and Exchange Commission (SEC), the National Insurance Commission (NIC), the National Pension Commission (PENCOM) and the Federal Mortgage Bank of Nigeria (FMBN) (CBN (2017)). Each of the regulatory institutions is empowered to regulate by its establishment Act. The institutional arrangement in the financial system in Nigeria covers both the conventional and Islamic financial institutions. However, for Islamic finance industry, another layer of governance was introduced, and that was the establishment of the Shari'ah Board at the regulatory institutions level.

Role of the Shari'ah Board (Financial Regulation Advisory Committee of Experts (FRACE))

In Nigeria, the Financial Sector's Shari'ah Board is known as the Financial Regulation Advisory Committee of Experts (FRACE). It was established by the Central Bank of Nigeria (CBN) on January 10, 2013. The key role of FRACE according to the guidelines of the body was to give an expert opinion and assistance on non interest (Islamic) banking and finance matters referred to it by the CBN and other regulatory agencies in the Nigerian financial system (CBN, 2015).

Islamic Finance Industry Development

A remarkable development in Islamic Finance in Nigeria began in 1991 when the Bank and Other Financial Institutions Act (BOFIA 1991) was amended to recognize a banking model that is based on profit and loss sharing. Consequently, the CBN issued Regulation No. 3 in 2010 and that redefined the banking business in Nigeria. According to Regulation 3 only three types of banking businesses are permitted to operate in Nigeria: (i) Commercial banks; (ii) Merchant banks; and (c) Specialized banks, which include non- interest banks (Islamic banks), microfinance banks, development banks and mortgage banks.

This development paved the way for CBN to issue a regulatory framework for the regulation and supervision of non-interest financial institutions in Nigeria in 2011. Subsequently, other regulatory bodies in the financial sector issued similar regulations. The NAICOM issued Takaful guidelines in 2013, the SEC issued The Rules 569-588 on the regulation of the Sukuk market as well as Islamic mutual funds in 2013, the NIDC issued guidelines on Non-Interest Deposit Insurance Schemes in 2015, and lately PENCOM issued the Operational Framework for Non-Interest Fund (FUND VI) to the pension fund administrators (PFAs) in 2021. The Islamic finance development trajectory is further corroborated by the Regulators as having been greatly evolved in the national financial system, however, there are no specific frameworks governing Islamic finance with respect to climate and disaster risks. The Regulators have however issued some guidelines on sustainable finance for both conventional and Islamic banks where banks are required to report their exposure to climate risks in their annual sustainability report. The

Regulators' initiatives in sustainable finance was driven by International Sustainability Standards Board (ISSB) and IFRS S1 and S2 standards for sustainability and climate related disclosures.

The Islamic Financial Industry, though has potential for growth is still a nascent industry compared to the conventional financial industry. The total Islamic Financial assets in 2023 was about NGN2.79 trillion or USD 1.78 billion and that represented only 0.002% of the total domestic financial assets (WAMI (2024)). Islamic Banks play predominant role in Islamic financial assets, representing approximately 54% of Islamic financial assets in 2023, followed by Sukuk which was around 43% (Udoma & Belo-Osage (2024), DMO, 2024)) and other instruments and players such as corporate sukuk, mutual fund and takaful account for around 3%.

The Islamic banking industry: The total assets of the Islamic banking industry in 2023 was about NGN1.355 trillion or USD856.18 million and that represented only 1.15% of the total domestic banking assets (CBN (2024)). However, it is the most significant player in the Islamic financial landscape as it accounts for 54% of the total domestic Islamic financial assets (Udoma & Belo-Osage (2024)). The Islamic banking industry comprised of 4 full-fledged non-interest banks, 1 Islamic window of conventional bank and 6 Islamic microfinance banks that were operational as at December 2023.

The performance of the Islamic banks was quite impressive. On the average, the assets of the Islamic banks grew by 64.1% while the assets of the conventional banks grew by 26.1% over the same period (CBN (2024)). Similarly, on the average, the Islamic Banks' deposits grew by 69.17% while that of the conventional banks grew by 27.56%. Furthermore, on the average, the financings by Islamic banks grew by 56.33% while loans by conventional banks grew by 23.70% over the same period (CBN (2024)). Thus, in terms of performance, the Islamic banks in Nigeria have consistently exhibited stronger intermediation capabilities than their conventional counterparts, as reflected in higher growth rates of assets, deposits, and financing activities.

Despite the impressive performance of Islamic banks relative to the conventional banks, an interview with Islamic banks officials revealed that the progress of Islamic banking in addressing climate-related challenges was not as rapid as that conventional banking who already have institutionalized process related to climate change financing. They maintained that the level of development, limited expertise and Shari'ah compliant instrument are some of the main challenges militating against the participation of Islamic banks in green financing initiatives

Sovereign sukuk were issued (7 issuances as at May 2025) by the Federal Government for the rehabilitation and construction of roads across Nigeria. The sovereign sukuk market share in 2023 was around ₦1.092 trillion (USD 691.83 million) or 2.48% of the total sovereign bonds. Corporate sukuk, amounting ₦10 billion (USD 6.34 million) representing 0.56% of the total corporate bonds market was issued by Taj bank in 2023 while a total of green sukuk amounting to ₦2.9 billion (USD 1.83 million), representing 4.26% of the total corporate green bonds market was issued by OneWattSolar and Prado Power Ltd to finance clean energy projects (DMO (2024, InfraCredit (2024), FitchRatings (2021)).

Islamic social finance: The institutions of Islamic social finance particularly *zakah* and *waqf*, are not well established in Nigeria as they are not formally institutionalized as federal government agencies but mainly handled on either individual or association based approach or at State level. Unlike in some Muslim countries where the central government organized the collection and distribution of Zakah, in Nigeria because of the multi-religious composition of the

country, that important task is left to various state governments and private Islamic organizations; and in most cases, the very burden of distributing Zakah is left to the individual zakah payers to find the needy who qualify for zakah (Abdullahi, S.H. et al (2022)).

National coordination of zakah and waqf activities is being spear-headed by a non-governmental and non-profit association, the Association of Zakat and Waqf Operators in Nigeria (AZAWON). The total amount of Zakah funds collected and disbursed by prominent agencies in Nigeria during 2023 was about ₦700 million and ₦975 million in 2024 indicating an impressive growth rate of 39.3% (www.muslimnews.com.ng). Thus, *zakah* and *waqf*, properly administered has the potential to contribute to national financial resilience and can have positive impact on financial stability by providing a financial cushion to low income earners in society in any economic cycle.

Regulatory Landscape to Promote Green Finance

To improve the enabling green environment, both regulatory bodies and government have introduced various initiatives and policies to promote green finance, aligning with global sustainability and climate change goals. Significant progress in Nigeria's sustainable finance landscape has been achieved through collaborative efforts involving the Ministry of Finance, Ministry of Environment, Debt Management Office, Central Bank of Nigeria, Securities and Exchange Commission and industry participants. Key milestones achieved include: Green Bond Issuance Program launched in 2017, Nigerian Climate Change Act (2021), National Development Plan (2021 – 2025), Nigeria Energy Transition Plan which was developed in 2022, Climate Finance Collaboration, Green Bond Regulatory Guidelines issued by SEC in 2018, ongoing collaboration among SEC, FMDQ and IsDB to develop a comprehensive framework for green sukuk, Sustainable Banking Principles issued by the CBN in 2012 and the green bond market development programme that was developed in 2019 by Financial Market Dealers Quotation (FMDQ) in partnership with Climate Bonds Initiative (CBI) and Financial Sector Deepening Africa (FSD Africa).

3.3.3. Islamic Financing Provisions for Climate Risk Mitigation and Natural Disasters Preparedness: Institutions, Products, and Offerings

Despite the impressive growth of climate finance by 32% in 2021/22 to USD 2.5 billion, it represents only 14.12% of the estimated USD 17.7 billion needed annually for mitigation and adaptation until 2030 (NCCC, 2023), and Nigeria's climate finance gap is likely even larger given that the existing needs estimates do not cover prospective loss and damage costs (CPI, 2024). Islamic finance is increasingly recognized as a viable tool for advancing climate action in Nigeria. Its principles of ethical investment, asset-backing, and risk-sharing align well with sustainable development goals and by leveraging instruments like green sukuk, green Shariah-compliant loans, and Islamic social finance, particularly Waqf, Nigeria can mobilize substantial capital to bridge its climate financing gap. Presently in Nigeria, green sukuk, Islamic green lending and waqf-based financing remain underdeveloped due to limited awareness and regulatory frameworks as well as institutional capacity. Despite these limitations, green sukuk is becoming popular as an instrument for financing climate related green projects.

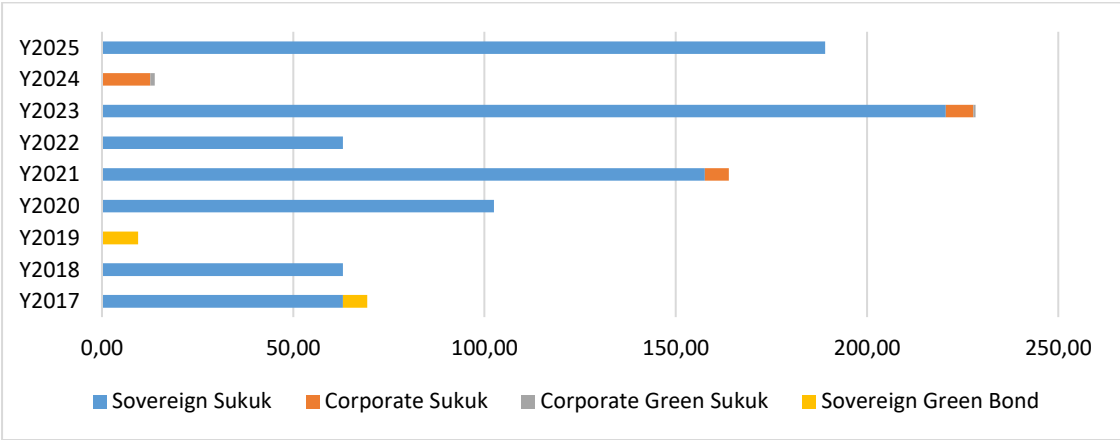
Green Sukuk is a Shariah-compliant fixed-income instrument structured to use the proceeds towards climate change integration, adaptation and environmental conservation projects. It also finances renewable energy, waste management, recycling, and energy projects that add to the environmental infrastructure, positively impacting the environment.

The global market for green Sukuk used to finance environmentally sustainable projects, is growing. Issuance in 2024 reached approximately \$180 billion, with the market expected to

reach \$1 trillion outstanding in the next few years. Some notable international transactions in 2024 in the green sukuk space include Indonesia’s 30-year green sukuk, a \$5 billion issue from Saudi Arabia, and a \$2.5 billion sustainability sukuk issued by the Islamic Development Bank. These transactions demonstrate the impressive depth of the green sukuk market. The largest jurisdictions for issuance during the year were Malaysia, Saudi Arabia, and Indonesia (World Bank 2025)).

There was no sovereign green sukuk issuance in Nigeria, however, Nigeria has issued sovereign sukuk based on Ijarah contract. The first sovereign sukuk was issued in 2017 amounting to N100 billion (approx. \$63 million), and to date there have been a total of seven (7) sovereign sukuk issuances (Figure 25 below) bringing the total amount raised by the DMO through the sovereign sukuk to N1.392 trillion (approx. \$877.36). The highest issuance was in 2023 when the DMO issued a sovereign sukuk amounting NGN350 billion (approx. \$220.59) (DMO, 2025).

Figure 28: Nigerian Sukuk Issuance (USD million | YTD)



Source: DMO

Thus, Figure 28 suggests that the Sovereign Sukuk dominates the sukuk issuance and the Federal Government of Nigeria (FGN) has continued to leverage Sukuk to fund essential infrastructure projects, with the most recent issuance being a NGN300 billion (\$189.08 million) sovereign Sukuk issued in May 2025. Though the Sovereign Sukuk issued was not green, it was environmentally friendly as the proceeds were used for roads construction and rehabilitation and in the process controlled erosion thereby conserving the environment. Although the green sukuk market in Nigeria is till at its infancy, there exist great potential for its application in financing climate related projects as Nigeria faces increased climate related natural disaster on a yearly basis.

The Islamic social finance (ISF) (Zakah, Waqf, and Infaq) as a financing instrument for mitigating climate change in Nigeria is also not well developed. Notwithstanding, Islamic Social Finance holds significant potential for climate change finance in Nigeria, especially in addressing climate-related emergencies and promoting sustainable development (Al-Daihani, M. et al (2025)). This is further corroborated by an interview with Islamic social finance specialist which revealed that Zakah and Waqf could contribute to climate change and disaster resilience programmes through the provision of short, medium and long term climate sustainability programmes as demonstrated in some States such as Sokoto and Gombe.

The climate change financing instruments in Nigeria's Islamic banks are not readily available. An interview with the Islamic bankers revealed that only two Islamic financial products: sukuk and takaful are currently available in the market which might be used for climate risk mitigation and disaster resilience. There is however, no any specific model that has been developed using Islamic finance to address climate or disaster risks, and it also appears there is no strategic vision or plan for developing new Sharia-compliant green finance products by the Islamic banking institutions in the country. Even though, the Islamic banking institutions have made no significant progress in developing green products, they are conscious about embedding climate risk into product development process as climate risk management form part of certain risk assessment criteria for specific products.

3.3.4. Incentive Mechanisms to Develop Islamic Financing Responses

Nigeria is a signatory to the Paris agreement on climate action and faces significant green financing gap for it to achieve its climate targets. However, both the conventional and Islamic green finance instruments are very limited in scope. Consequently, this calls for the need to have incentive mechanisms that can incentivize both the public and private entities to embrace both conventional and Islamic green financing. Green bonds and green sukuk are both instruments of green financing and since the objectives of the two instruments are the same, the incentive mechanisms for promoting these instruments are quite similar.

Fiscal Authority

The Nigerian government has implemented several fiscal incentives to encourage green funding. These incentives are embedded in various legislative frameworks, including the Electricity Act of 2023, the Industrial Development (Income Tax Relief) Act, and the Value Added Tax (VAT) Act. Specifically, the tax incentives on green ventures include: a five-year tax holiday for green project ventures, tax exemptions on dividend income derived from green project investments, VAT exemptions, import duty exemptions, capital allowances and investment tax credit (Aolaw (2025)).

Central Bank of Nigeria (CBN)

As part of its effort at promoting green financing in both Islamic and conventional banks in Nigeria, the CBN issued sustainable banking principles in 2012 in conjunction with the Bankers' Committee. The principles were meant to deliver positive development impacts to society while protecting communities and the environment in which financial institutions and their clients operate.

Furthermore, the CBN, the Bankers' Committee, and the Federal Ministry of Agriculture & Rural Development developed the Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL), which ultimately seeks to create incentives and encourage the growth of formal credit to the sustainable agriculture. This has acted as an incentive for the Nigerian banks to embrace sustainable agricultural financing.

Other Industry Players

The collaborative initiative of the Nigerian Exchange Group (NGX) and the Luxembourg Stock Exchange (LuxSE), a leading global platform for sustainable finance, has facilitated the cross-listing and trading of green bonds, enhancing their visibility and attractiveness to international investors and this has enabled Nigerian green bonds to gain global recognition and attract much-needed investment from environmentally conscious investors worldwide (NGX(2024)).

Additionally, in 2016, Africa Guarantee Fund (AGF) introduced a Green Guarantee Facility geared towards increasing financing for climate change mitigation and adaptation projects. AGF is an AA- Fitch rated Pan-African non-bank financial institution. AGF contributes to the promotion of economic development, vital for prosperity, stability and poverty reduction in Africa by being a partial guarantor to enhance access to finance for climate and green growth-oriented SMEs in Nigeria and West Africa at large (AGF (2025)).

3.3.5. Best Practices: Lessons Learned

Nigeria's progress in green Islamic financing is quite limited, however it has made some tremendous progress in green financing as a whole where some best practices were established which can easily dovetail into green Islamic financing. Some of the best practices and key lessons learned from green financing in Nigeria are briefly outlined below.

Climate Change Act, 2021 (“CCA”)

The Nigerian Climate Change Act was enacted in 2021 and it facilitates climate finance by establishing a legal framework that enables the mobilization and management of funds for climate action. It creates a Climate Change Fund, empowers a National Council on Climate Change to administer it, and outlines various funding sources like government appropriations, grants, and penalties for non-compliance. This framework aims to attract both public and private investment for transitioning to a low-carbon economy and building climate resilience.

Climate Budgeting in Nigeria

The de-carbonization programmes require huge financial commitment which is provided through budgetary provision. The budgeting system in Nigeria utilizes a classification and coding protocol that aligns various budget line items into stratified categories. The climate budgeting is effectively analyzed by the BudgetIT (a civic organization that uses innovative technology) where budget for the preservation of the environment and subsequent projects related to climate action are thoroughly assessed and tracked (Opaluwa and Awotoye (2024)).

Green Finance and Carbon Markets

The carbon market is a private sector led innovative initiative in climate change where the Nigerian Exchange Group (NGX) developed a robust carbon market, which would incentivize the preservation of forests and the restoration of degraded lands. Through the carbon market, companies and organizations can purchase carbon credits, which represent the removal or avoidance of a certain amount of greenhouse gas emissions. These credits can be generated by projects that protect or restore forests, as well as initiatives that combat desertification through sustainable land management practices; and by creating a demand for carbon credits, the carbon market provides a financial incentive for entities to invest in projects that mitigate deforestation and desertification. This market-based approach not only generates revenue for conservation efforts but also encourages the private sector to actively participate in environmental stewardship. Currently, NGX is collaborating with other stakeholders and the Nigerian Climate Change Council on the framework for Nigeria's carbon market (NGX (2024)).

Climate Risk Management

The CBN has issued principles and sector guidance for the banking sector that incorporate elements of climate risk in the overall ESG approach for risk management. They also provide a foundation for the incorporation of more comprehensive approaches to manage climate-related physical and transition risks and financial impacts. Preparations and activities include research,

surveys, and/or multi-stakeholder engagement and awareness raising on the expectations for climate risk management (World Bank (2024))

The Securities & Exchange Commission (SEC) Nigerian Sustainable Finance Principles, 2021 (“NSFP”)

The NSFP provides key principles on sustainable finance to improve economic prosperity and competitiveness while contributing to protecting and restoring ecological systems, enhancing cultural diversity and social well-being.

The Nigerian Stock Exchange Sustainable Disclosure Guidelines, 2018

The Guidelines contain provisions for sustainability reporting and disclosure by companies listed on the Nigerian Exchange which encompasses economic, environmental, social and governance factors.

Nigeria Green Tagging Banking Review

The *Nigeria Green Tagging Banking Review* offers guidance on developing a robust monitoring and disclosure framework for financial institutions to accurately and transparently report their green financial footprint to the Nigerian Central Bank and other financial regulators.

The Nigerian Green Bonds Market Development Programme

The Nigerian Green Bond Market Development Programme (NGBMDP) is a collaborative initiative which was launched by NGX in 2016 to foster green finance and promote sustainable investments in Nigeria, with the goal of developing a vibrant non-sovereign green bond market. It aims to integrate the principles of sustainability into the Nigerian capital markets, encouraging green projects and assets. Overall, the Nigerian Green Bond Market Development Programme is a crucial initiative to promote sustainable finance and climate action in Nigeria. It has played a significant role in developing the green bond market, raising capital for green projects, and building capacity within the capital markets.

Reporting Framework for Financial Institutions to Report on Green Financing

This is a framework for financial institutions to identify, tag and report on their green financial position. The report covers the following aspects: Description of Climate-related Risks, Definition of green/sustainable assets, Rules and guidelines governing the management of proceeds, Metrics and indicators for tagging and tracking assets as well as Framework for reporting on green finance

Thus, these are the best practices established for green finance in Nigeria, which are also applicable to green Islamic finance. These practices are good learning points for other OIC Member Countries if those practices are already not established.

Nigeria's progress in green Islamic financing is quite limited, however it has made some tremendous progress in green financing as a whole where some best practices were established which can easily dovetail into green Islamic financing. Some of the best practices and key lessons learned from green financing in Nigeria are briefly outlined below.

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Change to administer it, and outlines various funding sources like government appropriations, grants, and penalties for non-compliance. This framework aims to attract both public and private investment for transitioning to a low-carbon economy and building climate res

The CCA applies to and creates key obligations for the government and its agencies and public and private entities within Nigeria on the development and implementation of mechanisms geared towards fostering a low carbon emission, environmentally sustainable and climate resilient society.

Climate Budgeting in Nigeria

The federal government of Nigeria is a party to several international treaties, agreements and protocols that address the challenge of combating climate change. As a result, certain commitments were made to progressively decarbonize the country's energy consumption and transit to cleaner and more sustainable sources. The de-carbonization programmes require huge financial commitment which is provided through budgetary provision. The budgeting system in Nigeria utilizes a classification and coding protocol that aligns various budget line items into stratified categories. It begins with broad categories that have assigned codes under which line items are inserted and linked with the broader categories through the same coding protocol. As an example all capital expenditure related to the preservation of the environment falls under the umbrella code '2304' which is further broken down into various types of capital projects related to environmental issues. The climate budgeting is effectively analyzed using the BudgIT where budget for the preservation of the environment and subsequent projects related to climate action are thoroughly assessed. BudgetIT is a civic organization that uses creative technology to simplify public information, stimulating a community of active citizens and enabling their right to demand accountability, institutional reforms, efficient service delivery and an equitable society (Opaluwa and Awotoye (2024)).

Green Finance and Carbon Markets

The growing concerns about environmental degradation, climate change and sustainability have led to the creation of financing structures and funding (such as grants, bonds and loans) specifically targeted at green initiatives and businesses focused on sustainability, climate change mitigation and environmentally friendly technologies, products and services. Due to the nature of green funds, businesses that do not incorporate ESG factors and provide qualifying products or services will be unable to access green funding (Aluko&Oyebode (2023))

The carbon market is a private sector led innovative initiative in climate change where the Nigerian Exchange Group (NGX) developed a robust carbon market, which would incentivize the preservation of forests and the restoration of degraded lands. Through the carbon market, companies and organizations can purchase carbon credits, which represent the removal or avoidance of a certain amount of greenhouse gas emissions. These credits can be generated by projects that protect or restore forests, as well as initiatives that combat desertification through sustainable land management practices; and by creating a demand for carbon credits, the carbon market provides a financial incentive for entities to invest in projects that mitigate deforestation and desertification. This market-based approach not only generates revenue for conservation efforts but also encourages the private sector to actively participate in environmental

stewardship. Currently, NGX is collaborating with other stakeholders and the Nigerian Climate Change Council on the framework for Nigeria's carbon market (NGX (2024)).

Climate Risk Management

The CBN has issued principles and sector guidance for the banking sector that incorporate elements of climate risk in the overall ESG approach for risk management. They also provide a foundation for the incorporation of more comprehensive approaches to manage climate-related physical and transition risks and financial impacts. Preparations and activities include research, surveys, and/or multi-stakeholder engagement and awareness raising on the expectations for climate risk management (World Bank (2024))

The Securities & Exchange Commission (SEC) Nigerian Sustainable Finance Principles, 2021 ("NSFP")

The NSFP provides key principles on sustainable finance to improve economic prosperity and competitiveness while contributing to protecting and restoring ecological systems, enhancing cultural diversity and social well-being. For example, Principle 1 creates the framework for environmental, social and governance (ESG) considerations and Principle 3 focuses on human rights, women's economic empowerment, job creation and financial inclusion.

The Nigerian Stock Exchange Sustainable Disclosure Guidelines, 2018

The Guidelines contain provisions for sustainability reporting and disclosure by companies listed on the Nigerian Exchange which encompasses economic, environmental, social and governance factors.

Nigeria Green Tagging Banking Review

The *Nigeria Green Tagging Banking Review* offers guidance on developing a robust monitoring and disclosure framework for financial institutions to accurately and transparently report their green financial footprint to the Nigerian Central Bank and other financial regulators. In advancing the research into climate-related risks faced by Nigeria's financial sector, the UNEP Inquiry with the support of the Financial Centre for Sustainability (FC4S), Lagos, seeks to develop a robust monitoring and disclosure framework for financial institutions to accurately and transparently report their financial footprint (loans exposure to green/brown) to the Central Bank and other financial regulators, with the view of aggregating the positions and exposing the opportunities to private and institutional investors through green bonds issuance in the capital market.

The Nigerian Green Bonds Market Development Programme

The Nigerian Green Bond Market Development Programme (NGBMDP) is a collaborative initiative which was launched by NGX in 2016 to foster green finance and promote sustainable investments in Nigeria, with the goal of developing a vibrant non-sovereign green bond market. It aims to integrate the principles of sustainability into the Nigerian capital markets, encouraging green projects and assets.

The Programme has the overarching objective of developing a non-sovereign green bond market that will entrench the principles of sustainability into the Nigerian capital markets.

The NGBMDP has successfully organized ten (10) capacity building sessions for Investors, Intermediaries, Regulators, Media, Solicitors, Rating Agency, State Executive Councils and Verifiers. Also, it has delivered five (5) focused trainings for Banks, the Securities and Exchange Commission, Nigeria (SEC), and National Pension Commission (PenCom), etc. As part of its market development and capacity building efforts, the NGBMDP provided support for the development of guidelines and listings requirements for Green Bonds in Nigeria by the SEC, and organized training sessions focused on developing a pool of local Green Bond licensed verifiers, issuers, investors and intermediaries (FSDAfrica (2022)).

Overall, the Nigerian Green Bond Market Development Programme is a crucial initiative to promote sustainable finance and climate action in Nigeria. It has played a significant role in developing the green bond market, raising capital for green projects, and building capacity within the capital markets.

Reporting Framework for Financial Institutions to Report on Green Financing

This is a framework for financial institutions to identify, tag and report on their green financial position. The report covers the following aspects:

- Description of Climate-related Risks
- Definition of green/sustainable assets
- Rules and guidelines governing the management of proceeds
- Metrics and indicators for tagging and tracking assets
- Framework for reporting on green

Thus, these are the best practices established for green finance in Nigeria, which are also applicable to green Islamic finance. These practices are good learning points for other OIC Member Countries if those practices are already not established.

3.3.6. Country-Specific Policy Recommendations

Despite the potentials the green Islamic finance has in supporting Nigeria's climate initiatives, it is not adequately utilized because of some fundamental challenges identified in the preceding sections of the report. Addressing these challenges through some deliberate policy actions will unlock the potentials of green Islamic finance in Nigeria. Some of the challenges and policy recommendations are briefly discussed:

- **Limited Awareness and Public Education on Green Finance**

The level of awareness about green Islamic finance is generally low, as such there is a need for massive campaign to educate the public about green Islamic finance and its potential in raising funds for addressing environmental concerns.

Policy Action: The Federal Ministry of Finance, the Federal Ministry of Environment, Federal Ministry of Information and other relevant agencies of government should organize sensitization campaign and roadshows on the viability of green Islamic finance as a credible alternative for raising green finance.

- **Lack of Regulatory Framework for Green Sukuk**

Despite the modest developments in Green Sukuk in the private sector in Nigeria, there is no regulatory framework for green sukuk and according to Akinyele (2020) this presents some challenges in sukuk issuance.

Policy Action: The financial regulatory bodies in Nigeria: the CBN, the SEC in conjunction with the Debt Management Office (DMO) should collaborate and develop a robust green sukuk framework that will address the challenges in order to unlock the potentials of green sukuk for climate change financing.

- **Lack of adequate Green Shari'ah-Compliant Products**

The green Shari'ah-compliant products offered by Islamic banks in Nigeria are grossly inadequate. Additionally, green projects often involve new technologies, and this potentially introduces a layer of additional risks, which can be a disincentive for Islamic banks to finance green projects because of the implication of higher risks on their capital.

Policy Action: The CBN should have incentive mechanisms to incentivize Islamic banks to embrace green finance so that the Islamic banks can develop innovative and tailor-made green Islamic financial products that meet the specific needs of Nigerian investors and projects.

- **Shallow Secondary Market for Green Sukuk**

The secondary market for green sukuk is not well developed in Nigeria and this can have implications on investor liquidity and the overall growth of the sector. According to SEC, sukuk certificates tend to be held until maturity due to the absence of well-structured and sufficiently liquid secondary markets.

Policy Action: The key regulators in the financial sector in Nigeria should provide an enabling environment to develop domestic green sukuk markets by employing a developmental framework that is similar to the one used for developing the conventional bond markets.

- **Lack of Institutionalized Islamic Social Finance**

The institutions of Islamic Social Finance are mostly informal and being run by organized private societies and individuals and this has limited the role of Islamic Social Finance as a viable and formidable instrument for financing climate change related initiatives.

Policy Action: In order to actualize the potentials of Islamic Social Finance for green financing, the Federal government should come up with a framework for institutionalizing Islamic Social Finance in Nigeria.

- **Lack of Syndicated Green Financing Framework**

Green projects are normally capital intensive and bear high financing risk and individually, the capital base of the Islamic banks in Nigeria is quite small, but growing (FitchRatings (2024)). This weak capital base makes it difficult for an Islamic bank in Nigeria to finance green projects. However, the Islamic banks can come together and finance green projects in a syndicated manner.

Policy Action: The CBN should come up with a syndicated green financing framework that will enable Islamic banks to leverage the syndicated green financing option.

3.4. CASE STUDY: AZERBAIJAN

This country case analysis is comprehensively structured based on a combination of secondary sources and insights gained from field visits conducted in June 2025. During these visits, discussions were held with a diverse group of experts from key institutions in Azerbaijan. Meetings with representatives from the Ministry of Finance and the Central Bank of Azerbaijan (CBA) focused on fiscal policies and monetary strategies on climate change and Islamic finance. Additionally, the text outlines consultations with officials from the Ministry of Ecology and Natural Resources to grasp the country's environmental management and sustainability strategies. Discussions with representatives of Banks under the organisation of the International Bank of Azerbaijan provided insights into trends in the banking sector, particularly in Islamic finance initiatives. Additionally, there was an exploration of the dynamics of small and medium-sized enterprises through interactions with specialists from the Kiçik və Orta Biznesin İnkişafı Agentliyi / Small and Medium Business Development Agency (KOBİA), which offered insights into available support mechanisms for entrepreneurs regarding climate change adaptation. The text also highlights the relevance of Islamic finance within Azerbaijan's economic context, as discussed by various experts. This multifaceted approach ensures that the analysis is reflective of both theoretical insights and practical realities in Azerbaijan's economic framework.

3.4.1. Assessing the Country Risk for Climate and Natural Disasters

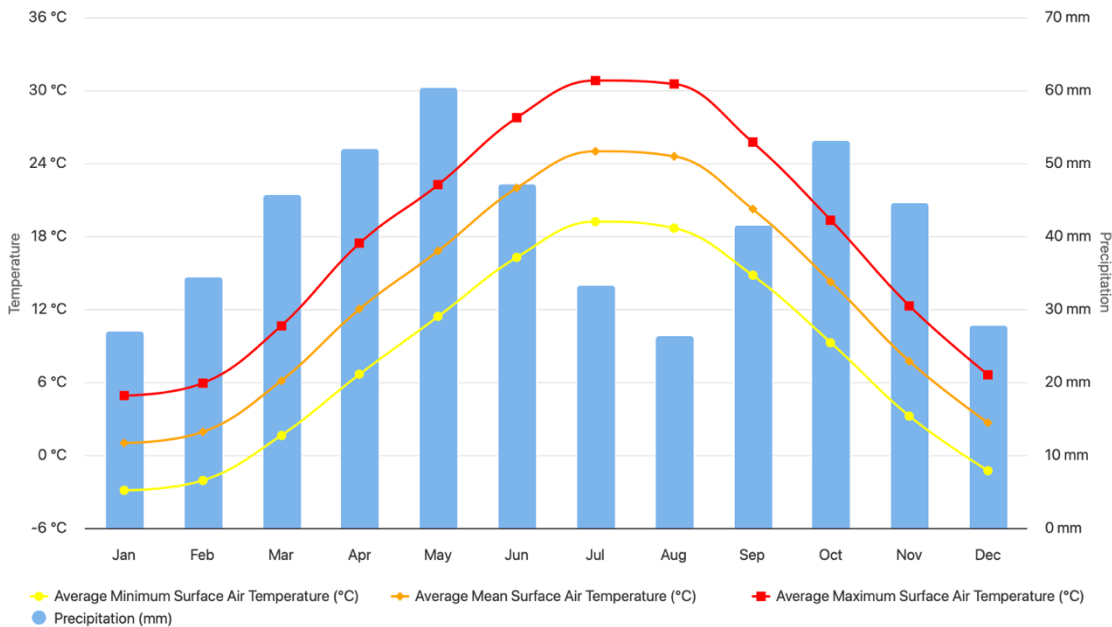
Climate Context

Azerbaijan's diverse geography is characterised by the imposing Greater Caucasus mountains to the north and the expansive Caspian Sea to the east, creating a dynamic interplay between lowland and highland regions. The country features a diverse climate with nine of the world's eleven climate zones represented across the country, including semi-arid areas in the central and eastern regions such as Baku, temperate zones in the north, continental climates in the west, and cold tundra zones, leading to significant differences in annual temperature and precipitation throughout various regions (WBG & ADB, 2021; RCCC, 2024). The Caspian Sea serves as a vital regulator of coastal temperatures, promoting a more temperate climate along the shore. Meanwhile, the orographic effects of the Caucasus mountains effectively block frigid northern air masses, ensuring that winters in the lowland areas remain relatively mild. This interaction not only influences temperature but also leads to significant spatial variations in precipitation across the region, fostering diverse ecosystems and agricultural practices (RCCC, 2024). Azerbaijan's geographical characteristics play a crucial role in shaping its climate and environmental diversity.

Observed warming is evident, as the mean annual temperature has increased, with a more rapid rise noted in the western highlands. Hot extremes, such as heatwaves, have become more frequent, while cold extremes have diminished (RCCC, 2024). According to a synthesis from national communications cited in the World Bank and ADB report, the mean temperature has risen by approximately 1.3 °C by 2010 compared to the period from 1961 to 1990. In Baku, summer temperature anomalies have reached up to 3.2 °C, and there has been around a 50% loss in glacier area from 1906 to 2006 (World Bank & ADB, 2021). Rainfall trends vary and are not statistically significant on a national scale; however, certain regions have experienced a higher frequency of intense rainfall events (RCCC, 2024; World Bank & ADB, 2021). There are notable differences in precipitation levels across regions, with about 200 mm of annual rainfall in the arid southeastern area, compared to 700–800 mm in the more humid northern and southwestern highlands (RCCC, 2024).

Observed Seasonal Cycle Average Minimum Surface Air Temperature, Average Mean Surface Air Temperature, Average Maximum Surface Air Temperature, Precipitation, Azerbaijan 1991-2020

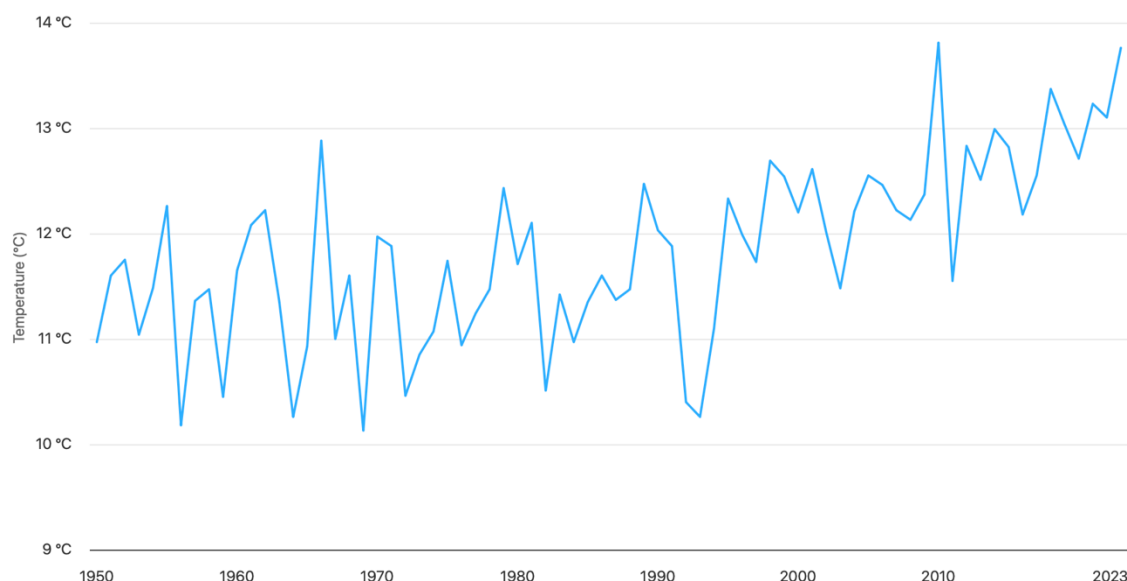
Figure 29: Observed Seasonal Cycle: Azerbaijan 1991-2020



Source: World Bank Climate Change Knowledge Portal, Country Overview: Azerbaijan, <https://climateknowledgeportal.worldbank.org/country/azerbaijan>

According to Figure 29, the Observed Seasonal Cycle for Azerbaijan illustrates the average intra-annual variation in climate parameters, highlighting the country's continental and semi-arid climatic patterns. For temperature, the cycle shows a steady increase from March, peaking in July–August at around 26–28°C, before declining toward winter lows of 1–3°C in January–February, underscoring the strong seasonality of the South Caucasus climate. The precipitation cycle demonstrates bimodal features, with a first peak in spring (April–May) linked to frontal rainfall and snowmelt, followed by reduced totals in midsummer, and a second, smaller peak in autumn (October–November), reflecting transitional weather systems. These seasonal dynamics are critical for agriculture and water resource management: spring and autumn rains support crop growth, while hot, dry summers increase irrigation demand and drought risk, particularly in dryland farming areas.

Figure 30: Observed Timeseries of Annual Average Mean Surface Air Temperature – Azerbaijan: 1950-2023



Source: World Bank Climate Change Knowledge Portal, Country Overview: Azerbaijan, <https://climateknowledgeportal.worldbank.org/country/azerbaijan>

The Observed Timeseries of Annual Average Mean Surface Air Temperature for Azerbaijan (Figure 30) shows a clear warming trend, with relatively stable conditions until the mid-20th century followed by a sharp rise since the late 1970s. Recent decades (2000s onward) consistently record above-average temperatures, indicating an increase of around 1.2–1.5°C compared with early 20th-century levels. This trend highlights growing risks of drought, heat stress, and water scarcity, underscoring the urgency of climate adaptation through resilient infrastructure, sustainable agriculture, and innovative financing tools such as green and Islamic finance instruments.

Under a high-emissions scenario, it is anticipated that by the mid-century, the average annual temperature could increase by approximately 2 to 3°C, with the possibility of even greater increases thereafter. Furthermore, both maximum and minimum temperatures are predicted to rise at a rate that outpaces global averages (RCCC, 2024). Looking towards the end of the century, the WB/ADB ensemble forecasts an annual temperature increase of around 4.7°C under the RCP8.5 scenario, with even more pronounced warming of 5.6 to 5.9°C during the peak summer months of July through September. This warming trend is expected to extend the number of summer days where temperatures exceed 25°C significantly (World Bank & ADB, 2021).

In terms of precipitation, projections indicate a slight overall decline, particularly during the critical months of July and August. However, it is also expected that the intensity of heavy rainfall events will increase, which could elevate the risks of flash floods and landslides (RCCC, 2024; World Bank & ADB, 2021). Additionally, the Caspian Sea poses a significant slow-onset risk, with earlier studies conducted by the WB/ADB forecasting a decline in sea level of approximately 4 to 5 meters by the end of the century (World Bank & ADB, 2021). More recent analyses continue

to project considerable reductions in sea level due to evaporation driven by warming, which could lead to significant ecological disruptions (UNEP-DHI, 2024).

Key Climate Hazards and Past Disasters

Azerbaijan is exposed to multiple climate-related hazards, including droughts, floods, strong winds, heatwaves, and forest fires. Climate risk mapping conducted under the National Adaptation Plan identifies significant regional disparities: while the north-west region recorded the highest positive temperature anomaly (+1.6°C), semi-arid lowlands experienced severe reductions in precipitation, accentuating drought risks (Ministry of Ecology and Natural Resources, 2024). Floods and mudflows have become more frequent, especially in the Greater Caucasus mountains, damaging infrastructure and livelihoods. Similarly, strong winds and heatwaves increasingly threaten agricultural productivity and urban settlements

Past disasters underline these risks. Over the past two decades, water resources have declined by approximately 15%, while the Caspian Sea level has fallen by more than two meters, disrupting ecosystems and coastal economies (Ministry of Ecology and Natural Resources, 2024). Mountain ecosystems have also suffered from spring reductions and erosion, leading to losses of forests, pastures, and grass cover, with implications for biodiversity and rural communities.

From 1970 to 2021, Azerbaijan faced a total of 13 documented disaster events, according to the ESCAP Disaster Risk and Resilience Portal (Table 8). Among these incidents, floods emerged as the most frequent occurrence, with 7 separate flood events impacting various regions of the country, often leading to significant damage to infrastructure, homes, and agriculture. Earthquakes were the second most common disaster, with 5 recorded events. Additionally, the country experienced a single drought during this period.

Table 8: Past Disasters (EM-DAT) (1970 - 2021)

	Number of Events (Events)	Number of Deaths (People)	Number of Affected (People)	Number of Damaged (USD, millions)
Drought	1			100.0
Floods	7	19	1,840,300	96.2
Earthquake	5	33	734,971	15.0

Source: ESCAP Disaster Risk and Resilience Portal, Past Disasters in Azerbaijan, <https://rrp.unescap.org/country-profile/aze>

Floods: Riverine floods occur along the Kura and in Lankaran–Astara; mountain floods peak in late spring–early summer, and lowland floods in spring–autumn (Government of Azerbaijan, 2021). Significant flooding events took place in 1995 and 2003. Annually, approximately 10,000 individuals are impacted by flooding, leading to damages totaling 30 million US dollars (GFDRR, 2017). WB/ADB’s risk analytics show significant exposure to 1-in-25 flood events and notable GDP at risk (World Bank & ADB, 2021). Land degradation (deforestation/overgrazing) amplifies runoff and mudflow risk (RCCC, 2024, p. 3).

Drought: Azerbaijan faces meteorological and hydrological droughts that cascade into agricultural drought; under higher warming, severe drought probability rises from ~2% historically to ~73–85% by the 2090s (RCP6.0/8.5) (World Bank & ADB, 2021; RCCC, 2024).

Landslides: Susceptible belts include the southern and north-eastern Greater Caucasus slopes, the Lesser Caucasus, and Talysh; activity has been rising with erosion and intense rainfall (World Bank & ADB, 2021; RCCC, 2024).

Heatwaves: Urban heat—especially in Baku—is expected to intensify due to rising maxima, longer heatwave durations, and more very hot days (>35 °C) (RCCC, 2024; World Bank & ADB, 2021).

Table 9, featured in the ESCAP Disaster Risk and Resilience Portal, also quantifies the scale and economic burden of natural hazards by presenting key metrics such as Average Annual Loss (AAL) as a percentage of GDP and estimated adaptation costs. Under baseline conditions, annual disaster-related losses are equivalent to approximately 2.7% of GDP, increasing to about 3.1% under SSP3 2°C warming scenarios, with cumulative adaptation costs estimated at 0.5% of GDP—highlighting the financial urgency of building resilience in the face of climate-driven risks. According to the ESCAP country profile for Azerbaijan, the highest priorities for climate adaptation are centered on resilient water management, sustainable dryland agriculture, and climate-proof infrastructure, which together represent the most critical pathways to reducing vulnerability and safeguarding long-term development.

Table 9: Average Annual Loss (AAL), Current

	USD, Millions	% GDP
Drought	720.5	1.4
Floods	52	0.1
Earthquake	513.3	1.0
Biological	53.4	0.1
Multihazards	1,389.2	2.7

Source: ESCAP Disaster Risk and Resilience Portal, Disaster Risk for Azerbaijan, <https://rrp.unescap.org/country-profile/aze>, access date: 20 August 2025

Impacts of Climate Change

Recent decades have seen notable climatic changes. Between 2001 and 2023, Azerbaijan’s annual average temperature anomaly reached +1.1°C compared to the 1971–2000 baseline, with the average temperature in 2023 recorded at 14.6°C, nearly 1.9°C above the historical norm (Ministry of Ecology and Natural Resources, 2024). Meanwhile, precipitation declined by 6.3% relative to the 1971–2000 baseline, and by 10% over the past 13 years, with particularly sharp decreases in the Aran, north-west, and mountain regions. These trends highlight the intensifying hydrological stress and the risks of droughts, floods, and heatwaves for Azerbaijan’s socio-economic development.

The impacts of climate change in Azerbaijan are multi-sectoral, affecting water resources, agriculture, ecosystems, and public health. Water availability is the most critical concern: declining precipitation, glacier retreat, and increased evapotranspiration have reduced renewable water resources by 15% in the last 23 years (Ministry of Ecology and Natural Resources, 2024). These reductions place significant strain on irrigation, municipal water supply, and hydropower generation, particularly in regions where agriculture dominates rural livelihoods. Agriculture is increasingly vulnerable to rising temperatures, droughts, and soil degradation, resulting in declining crop yields and heightened risks of pest and disease outbreaks. The Caspian Sea’s falling levels threaten fisheries, coastal industries, and

infrastructure, while mountain ecosystems face biodiversity losses and degradation of ecosystem services essential to local communities and tourism.

The rapid economic growth in Azerbaijan has largely been fueled by its hydrocarbon resources, with oil and gas accounting for 88% of the country's exports as of 2016 (World Bank & ADB, 2021). However, the economy and the livelihoods of rural populations are vulnerable to climate fluctuations, as agriculture continues to employ a significant portion of the rural workforce (RCCC, 2024). Moreover, Azerbaijan faces risks from hydrometeorological and geophysical events; it is ranked 64th out of 191 nations on the INFORM Risk Index (2025, 2nd Edition). According to the UNESCAP's Risk & Resilience Portal, the country experiences notable average annual loss estimates and increasingly pressing needs for adaptation strategies (UNESCAP, n.d.). This context underscores the critical intersection between economic reliance on hydrocarbons, climate vulnerability, and the urgent necessity for enhanced resilience measures to safeguard both the economy and the livelihoods of its people.

Azerbaijan's water resources face significant challenges, largely due to the fact that a substantial portion of its renewable water supply originates from outside its borders. This reliance makes the country particularly sensitive to conditions upstream, as highlighted by the World Bank and ADB in their 2021 report. Recent analyses from the RCCC indicate that Azerbaijan has experienced an alarming estimated decline of approximately 20% in water reserves over the past three decades. Projections for the future are even more concerning, with expected additional declines of 5-25% between 2040 and 2070, contingent upon various scenarios. Such trends emphasise the urgent need for adaptive measures, as underscored by UNESCAP's analytics page.

The agricultural sector is also under pressure from climate change, with a marked increase in heat and water stress adversely affecting crop yields, particularly for staple crops like wheat. Furthermore, the demand for irrigation has intensified, while the range of agricultural pests is expanding. Approximately 80% of Azerbaijan's farmland lies within semi-arid or arid zones, where these challenges are exacerbated. The most recent updates in ReliefWeb's Azerbaijan Climate Country Profile highlight the escalating climate-related pressures confronting the agricultural landscape, coupled with an increasing vulnerability of food systems that threaten national food security.

The coastal regions, which are home to approximately 40% of Azerbaijan's population and 75% of its industry along the Caspian Sea, face existential threats from sustained sea-level changes. Declines in sea levels could have devastating consequences for ports, fisheries, coastal tourism, and wetlands. Ongoing analyses continually warn of potential multi-meter declines in sea levels this century, emphasising the ecological and economic ramifications of such changes on the nation's coastal communities. Collectively, these factors illustrate the profound and interconnected impacts of climate change on Azerbaijan's environment, economy, and public health, necessitating an urgent and comprehensive response.

Climate Adaptation Policy and Planning

Azerbaijan's economy remains heavily reliant on hydrocarbon resources, which accounted for roughly 47.8% of its GDP and over 92.5% of its export revenues in 2022, as reported by the International Trade Administration (ITA, 2023). This extensive dependence on oil and gas further exposes the country to economic vulnerabilities, emphasising the urgent need for diversification in its economic structure. This necessity is particularly pressing given the global transition toward sustainable energy solutions, which calls for a reevaluation of traditional energy dependencies.

From an environmental standpoint, Azerbaijan contributes approximately 0.15% of the world's total GHG emissions, with the energy and agriculture sectors being the primary sources. The energy sector, in particular, is a significant contributor to GHG emissions due to its reliance on fossil fuel combustion. Additionally, conventional farming practices in the agricultural sector often fail to incorporate sustainable methods, making it susceptible to the impacts of natural disasters such as floods. In response to these challenges, the Azerbaijan government has initiated various strategies aimed at curbing emissions stemming from land use, forestry, waste management, and industrial activities. International collaborations have also boosted these efforts; for instance, USAID has partnered with the Azerbaijani government to bolster climate resilience through initiatives emphasising climate-smart agriculture and necessary energy reforms (USAID, 2024).

Azerbaijan's role as the host for COP29 has intensified its commitments to climate action, further aligning with international initiatives aimed at mitigating climate risks. The country originally set a goal to reduce GHG emissions by 35% by 2030 under its Nationally Determined Contributions (NDC) but later revised this commitment to a more ambitious 40% reduction by the year 2050. By 2022, Azerbaijan had successfully cut total emissions by 16-18% compared to its 1990 levels, mainly driven by a notable 25% decrease in emissions from the energy sector. Despite producing only 0.11% of the world's GHG emissions, Azerbaijan ranks among the nations that are most vulnerable to the consequences of climate change (UNDP, n.d.). In response to this concern, fostering a green economy has become a national priority under its strategic framework "Azerbaijan 2030: National Priorities for Socio-economic Development," aimed at fulfilling the objectives of the Paris Agreement (Azerbaijan, 2025). This strategic framework is put into action through the 2022-2026 Socio-economic Development Strategy, which integrates green technologies, establishes a national emissions database, and sets out plans for adaptation and energy efficiency improvements. Furthermore, the country plans to enact a law concerning "The Management of Greenhouse Gases Released into the Atmosphere," which will lay the groundwork for a carbon trading framework.

Though Azerbaijan continues to depend heavily on oil and gas—echoing a common challenge facing many emerging economies—advancements in technology have led to a slight reduction in its carbon footprint. The country aims to boost its renewable energy capacity to account for 30% of its energy mix by 2030, striving to position itself as a leader in green energy. This ambition includes the integration of solar and wind power facilities within its existing energy infrastructure (COP29, n.d.).

Financial assistance is pivotal for Azerbaijan to achieve its climate goals, particularly in light of ongoing challenges in attracting private investment. However, Azerbaijan's leadership during COP29 has sparked a notable transformation in the climate finance landscape, both within the country and on a global scale. The banking sector, which constitutes around 95% of the nation's total financial assets (OECD et al., 2018), has committed to financing \$1.2 billion in green projects by 2030, leveraging international partnerships, public-private collaborations, and green bond issuances. This follows the establishment of a Green Taxonomy by the CBA in November 2024 (Interfax, 2024; CBAR, 2024). Under Azerbaijan's presidency during COP29, the Baku Finance Goal was introduced, aiming for a target of \$1.3 trillion in climate financing for developing countries by 2035, significantly raising the previous target from \$100 billion to a new goal of \$300 billion (COP29, 2024). This initiative has contributed to shaping a global climate finance framework designed to support developing nations while unlocking new investment opportunities worldwide. Additionally, during COP29, an agreement was reached on a global roadmap for green taxonomies to further facilitate climate finance (Costa, 2024).

Recognising the pressing nature of climate change, Azerbaijan has embarked on significant initiatives aimed at addressing its detrimental effects by developing and implementing various policy documents related to climate. The successful organisation of the 29th Conference of the Parties (COP29) in Baku in 2024 serves as a strong indicator of the nation's dedication to global climate efforts, showcasing its active engagement and contribution to international climate dialogue (COP29-Baku, 2024).

The Ministry of Emergency Situations leads DRM, supported by national strategies and a forthcoming DRR strategy to 2030 (RCCC, 2024). Early-warning systems are being upgraded, but local preparedness and integration of climate projections into planning remain weak. International agencies, including the UN and World Bank, are assisting with hazard mapping, hydrometeorological modernisation, and community preparedness.

Azerbaijan's updated NDC commits to a 40% GHG reduction by 2050 (RCCC, 2024). The National Adaptation Plan process prioritises water, agriculture, and coastal management. In 2024, the Green Climate Fund approved a US\$35 million early-warning systems project to strengthen impact-based forecasting and anticipatory action (ReliefWeb, 2024).

The 2024 NAP is a milestone in Azerbaijan's climate governance. It establishes a structured and participatory framework, led by the Ministry of Ecology and Natural Resources and supported by inter-ministerial and regional councils. This ensures coordination across national and local levels, while emphasising inclusivity for vulnerable groups, including women, children, elderly citizens, and internally displaced persons (Ministry of Ecology and Natural Resources, 2024).

Strategically, the NAP focuses on three priority pillars: water security, climate-smart agriculture, and coastal resilience (Ministry of Ecology and Natural Resources, 2024). Measures include modernised irrigation systems, adoption of drought-tolerant crop varieties, restoration of coastal ecosystems, and investments in resilient infrastructure. A cross-cutting priority is the strengthening of multi-hazard early warning systems (EWS). In this regard, Azerbaijan has already secured significant international support: in October 2024, the Green Climate Fund approved a US\$35 million project to enhance climate information services and impact-based EWS, directly complementing NAP objectives (ReliefWeb, 2024).

The NAP also advances enabling mechanisms. It outlines a national Monitoring, Evaluation, and Learning framework with measurable indicators, institutional capacity building, and integration of adaptation measures into the national budgetary process (Ministry of Ecology and Natural Resources, 2024). Earlier concerns, such as the absence of GCF projects noted in the RCCC Factsheet (2024), are now being addressed through this financing milestone.

3.4.2. The Trajectory of Islamic Finance: Institutionalization, Legal and Regulatory Framework, and Financial Standing with Particular Reference to Climate Risk Mitigation and Natural Disasters Preparedness

Azerbaijan, a Muslim-majority nation strategically located at the crossroads of Europe and Asia, has been gradually exploring Islamic finance as a complement to its conventional financial system. Despite historically limited regulatory framework for Islamic banking, the country has experienced a slow but notable trajectory of interest in Islamic finance. Over the past two decades, attempts at integrating Islamic finance have moved from small experiments—such as “Islamic windows” within state banks—toward structured discussions on sukuk issuance, regulatory frameworks, and cooperation with international Islamic financial institutions.

Efforts to introduce Islamic finance in Azerbaijan began in the early 2000s, primarily led by the International Bank of Azerbaijan (IBA), the largest state-owned financial institution in the country. In 2011, IBA announced its intention to launch Islamic banking services, including profit-and-loss sharing instruments such as *mudarabah* and *musharakah*, along with Islamic leasing (*ijara*) and *sukuk* issuance. By 2013, the bank opened an Islamic banking department, operating through an Islamic window (Dadashova, 2013). However, in 2015, the IBA closed its Islamic banking department, citing internal restructuring despite a rising demand for Islamic financial products and an increasing asset base that reached \$526 million in Islamic finance portfolios (Reuters, 2015). This decision underscored the necessity for a robust legal and regulatory framework to support Islamic finance.

Since the mid-2010s, initiatives in Islamic finance have continued to be explored in Azerbaijan, although they faced several challenges that inhibited progress. These challenges included a lack of awareness among the general population regarding Islamic financial products, limited regulatory support, and a prevailing preference for conventional banking systems. Recently, there has been a noticeable resurgence of interest in Islamic finance within Azerbaijan. The government, along with financial regulators, has begun to recognize the potential advantages of incorporating Islamic finance into the broader financial landscape. This renewed focus has led to the inclusion of Islamic finance in the national economic agenda, indicating a positive shift towards embracing these financial principles.

The most significant shift in recent years has been active government and central bank engagement. The CBA has held discussions with the IsDB, Al Baraka Group, and other global Islamic finance stakeholders on establishing Islamic banking frameworks (Azertag, 2024; Azernews, 2025). These initiatives signal that Azerbaijan's Islamic finance development is increasingly aligned with international best practices and supported by global Islamic financial institutions.

Sukuk issuance is viewed as the most immediate and feasible entry point for Azerbaijan into global Islamic capital markets. In 2024, the Baku Stock Exchange confirmed ongoing consultations with IsDB on launching *sukuk* in local currency, modelled after Kazakhstan and Uzbekistan's recent experiences (ABC.AZ, 2024a). Islamic finance in Azerbaijan is entering a formative stage, as the Central Bank of Azerbaijan, in cooperation with the World Bank, is preparing legislation for *sukuk* issuance while negotiating with local banks to pilot operations in a test mode. According to CBA Chairman Taleh Kazimov, *sukuk* will be introduced first, followed by the gradual establishment of Islamic banking over the next three to five years (ABC.AZ, 2024b). *Sukuk* could play a dual role: mobilising investment for infrastructure and SMEs, and creating an anchor for the Islamic finance industry's growth.

In November 2024, it was reported that one local bank formally applied to the CBA to operate Islamic banking services, marking an important step in testing Shariah-compliant products within the national financial system. Key players in the financial sector are now beginning to engage with Islamic banking practices, promoting products that comply with Shariah law, such as profit-sharing *mudarabah* and lease-based *ijarah* contracts. Additionally, initiatives are underway to educate both consumers and financial institutions about the principles and advantages of Islamic finance. Regulatory bodies are also working to establish a clearer legal framework that will facilitate the development of Islamic financial institutions, encouraging foreign investment and fostering a more diverse financial landscape in Azerbaijan. This holistic approach aims to harness Islamic finance as a means to boost economic growth and financial inclusion in the country. With these recent initiatives, there is cautious optimism that Islamic finance can find a suitable foothold in Azerbaijan's evolving financial market.

3.4.3. Islamic Financing Provisions for Climate Risk Mitigation and Natural Disasters Preparedness: Institutions, Products, and Offerings

While Islamic finance currently constitutes a relatively minor segment of Azerbaijan's financial system, it is poised for significant growth given the right conditions. The demographic profile of the country is particularly advantageous, as a sizeable portion of the population identifies as Muslim—providing a natural base for the uptake of Islamic financial products. Furthermore, Azerbaijan's robust economic and cultural ties with Türkiye, along with its relationships with several Gulf states, which have well-established Islamic finance frameworks, position the country to leverage existing knowledge and practices in this sector effectively.

Geographically, Azerbaijan holds a strategic position among Turkic and Central Asian countries, potentially serving as a hub for collaboration, trade, and the exchange of ideas within the Islamic finance industry. This interconnectedness could enable Azerbaijan to not only adopt successful strategies from its neighbours but also contribute its innovations to the broader region.

Despite this favourable context, the promise of Islamic finance remains inadequately tapped, particularly regarding initiatives aimed at combating climate change. The development of tailored Islamic financing mechanisms could unlock vital funding streams for renewable energy projects, sustainable agricultural methods, and other environmentally beneficial initiatives. Professionals and experts with experience in the Caucasus region have pointed out the critical need for such developments (ReportAZ, 2024).

Islamic finance is still an experimental step in the country, and therefore, there has not been significant development regarding climate change and disaster risk mitigation in terms of Islamic finance. However, several developments can be associated with Islamic green finance. During COP29 in Baku (2024), the CBA announced preparations for the country's first green sukuk, which would also mark its debut sovereign Islamic bond issuance. This initiative represents a strategic step to align sustainable finance with Islamic principles, leveraging sukuk as a tool to channel investments into renewable energy, energy efficiency, and low-carbon infrastructure projects. Experts at the COP29 Green Islamic Finance Panel emphasised that Islamic finance is inherently green, as its asset-backed and ethical nature supports transparency, environmental stewardship, and social responsibility. By planning a green sukuk, Azerbaijan is not only mobilising climate-friendly capital but also framing an Islamic green finance program that could serve as a model for other countries in the region (IFN, 2024).

At COP29 in Baku, the KOBİA also organised a panel discussion titled "The Role of SMBs in the Green Economy", spotlighting how small and medium-sized businesses are key to driving the green transition through climate financing, responsible environmental practices, and ESG adoption (KOBİA, 2014). Simultaneously, a high-level panel convened by the IsDB showcased the growing potential of green sukuk—Shariah-compliant finance instruments that channel capital toward environmental projects—as vital tools for mobilising climate finance and providing a transparent, asset-backed alternative for sustainable investment. Together, these initiatives reflect a strategic synergy in Azerbaijan's green finance agenda. By linking SMEs to Islamic finance mechanisms such as green sukuk, Azerbaijan can create accessible channels for climate-aligned funding that are both Shariah-compliant and impact-oriented. In practice, SMEs could benefit from sukuk proceeds earmarked for energy efficiency, renewable energy, and sustainable agriculture, thereby integrating local business dynamism into the broader Islamic green finance framework. This synergy positions SMEs not only as beneficiaries but also as frontline actors in scaling up sustainable and ethical finance in Azerbaijan.

To effectively harness the potential of Islamic finance in addressing climate challenges, it is essential to create a comprehensive framework that integrates Islamic financial principles with climate action strategies. Such a framework could include Sharia-compliant investment vehicles tailored specifically for green projects, sukuk aimed at funding renewable energy initiatives, and microfinance options tailored to support sustainable agricultural practices among local farmers.

The successful establishment of this integrated approach would not only benefit Azerbaijan by advancing its green initiatives but could also serve as a significant model for other countries within the OIC. Many OIC Member Countries face challenges stemming from limited infrastructure for Islamic finance, alongside the burgeoning need for effective climate change strategies. By sharing its experiences, challenges, and lessons learned, Azerbaijan could provide invaluable insights and recommendations that bolster the capacity of these nations. This, in turn, could foster a more collaborative and robust response to climate impacts across the OIC region, leading to enhanced sustainability and resilience for all member countries.

The intersection of Islamic finance and climate action holds transformative potential for Azerbaijan, with the possibility of setting a precedent and serving as a catalyst for broader regional cooperation aimed at addressing environmental challenges.

3.4.4. Incentive Mechanisms to Develop Islamic Financing Responses

Islamic finance is increasingly recognised in Azerbaijan's financial strategy as an innovative and inclusive mechanism to diversify investment and mobilise capital. The 2024–2026 Financial Sector Development Strategy explicitly calls for the creation of a legal framework to promote the issuance of sukuk and other Shariah-compliant products within capital markets (Central Bank of Azerbaijan, 2024). Moreover, the banking sector strategy highlights the potential for Islamic banking to be developed under the regulatory sandbox (Central Bank of Azerbaijan, 2024). These initiatives position Islamic finance not only as a niche product but as a broader incentive mechanism to channel investment into real sector growth, enhance financial inclusion, and integrate ethical, asset-backed instruments into Azerbaijan's evolving financial ecosystem. The implementation of regulations for Islamic finance could also significantly enhance financial inclusion within the country (İqtisadi İslahatların Təhlili və Kommunikasiya Mərkəzi, 2023).

The CBA has established a Regulatory Sandbox (<https://sandbox.cbar.az/en/>), providing a controlled environment for financial institutions and fintech firms to pilot innovative products under regulatory oversight before full market deployment. This initiative, characterised by a streamlined approval process, consumer safety safeguards, and licensing exemptions during testing, aims to accelerate financial innovation and inclusivity while managing systemic risk effectively. Although the sandbox currently encompasses a broad range of fintech and payment solutions, it holds considerable potential as a catalyst for Islamic finance innovation in Azerbaijan—offering a flexible, low-risk channel for launching Shariah-compliant products. Several conventional banks have already applied to participate in the sandbox, reflecting the growing interest of Azerbaijan's financial sector in adopting new technologies and diversifying product offerings. The platform provides an opportunity to explore Islamic finance solutions, such as Shariah-compliant lending models, sukuk-based digital platforms, or micro-takaful products. By allowing experimentation within a regulated framework, the sandbox can facilitate the gradual and risk-mitigated introduction of Islamic finance into Azerbaijan's banking landscape, thereby contributing to financial inclusion and supporting the country's green and sustainable development priorities. By enabling such products to be trialed in a real-market setting, the sandbox can also help to build institutional confidence, attract investment interest,

and support the gradual integration of Islamic financial models into the broader financial ecosystem.

The most significant shift in recent years has been active government and central bank engagement. The CBA has held discussions with the IsDB, Al Baraka Group, and other global Islamic finance stakeholders on establishing Islamic banking frameworks. In 2024, a local bank formally applied to the CBA to offer Islamic banking products, with regulatory preparations focusing on sukuk issuance and eventual introduction of Islamic banking within 3–5 years.

Sukuk issuance is viewed as the most immediate and feasible entry point for Azerbaijan into global Islamic capital markets. In 2024, the Baku Stock Exchange confirmed ongoing consultations with IsDB on launching sukuk in local currency, modeled after Kazakhstan and Uzbekistan's recent experiences. Sukuk could play a dual role: mobilizing investment for infrastructure and SMEs, and creating an anchor for the Islamic finance industry's growth.

In 2024, the Azerbaijan Banks Association (ABA) visited Malaysia's Islamic Banking and Finance Institute (IBFIM) to exchange expertise and explore collaboration. In February 2025, IsDB President Muhammad Al Jasser met with CBA Governor Taleh Kazimov in Saudi Arabia, reaffirming IsDB's commitment to capacity building, sukuk issuance, and technical assistance for Azerbaijan. These initiatives signal that Azerbaijan's Islamic finance development is increasingly aligned with international best practices and supported by global Islamic financial institutions.

3.4.5. Best Practices: Lessons Learned

Hosting COP29 successfully is crucial for several reasons. This event has served as a significant platform to showcase the country's commitment to addressing climate change and promoting sustainable development. The hosting will not only elevate the nation's profile on the global stage but also attract potential investments and partnerships focused on green technologies. To facilitate this, the government has been active in accelerating green financing initiatives across various sectors. The central bank has taken the lead in developing comprehensive strategies to promote green finance, including the establishment of a taxonomy that clearly defines and categorises environmentally sustainable activities. This taxonomy will help guide investors and financial institutions in identifying and supporting projects that contribute to the green economy.

Azerbaijan's Initial National Adaptation Plan (NAP, 2024) represents a best practice in structured climate governance, as it provides a clear, phased framework for reducing vulnerability and strengthening resilience across priority sectors such as water, agriculture, coastal and mountain ecosystems. Developed with support from UNDP and the Green Climate Fund, the NAP demonstrates international alignment while ensuring national ownership by embedding adaptation within the country's institutional architecture, led by the Ministry of Ecology and Natural Resources and coordinated through the State Commission on Climate Change. Its integration with Azerbaijan 2030: National Priorities for Socio-Economic Development ensures coherence between climate adaptation and green growth, while the emphasis on developing an adaptation financing framework and monitoring system highlights a results-oriented approach. By prioritising resilience in water management, sustainable agriculture, and infrastructure, the NAP serves as a model for how countries with diverse ecological zones and socio-economic vulnerabilities can operationalise climate commitments through coordinated policy planning, thereby aligning national resilience with global climate diplomacy.

Moreover, the transition to a green economy is particularly vital for micro, small, and medium-sized enterprises (MSMEs) in the country. These businesses are often the backbone of the economy and play a crucial role in job creation. Significant steps have been undertaken by the Azerbaijan government, particularly by KOBİA to ensure that MSMEs have access to the necessary resources, funding, and support systems to adopt sustainable practices. This includes initiatives aimed at providing them with the tools and financial mechanisms to enhance their operations, reduce their carbon footprint, and incorporate innovative green technologies, thereby contributing to the overall green transformation of the country.

3.4.6. Country-Specific Policy Recommendations

Recommendation 1: Introduce Green Sukuk for Climate-Resilient Infrastructure

Azerbaijan is already preparing legislation on sukuk with support from the World Bank. This framework can be expanded to pilot green sukuk dedicated to financing renewable energy, climate-resilient infrastructure, flood control systems, and drought-resistant irrigation. Sukuk instruments could be structured to attract Gulf and Malaysian investors, aligning with global standards such as ICMA's Green Bond Principles and AAOFI guidelines. This approach would not only mobilise long-term, Shariah-compliant capital for adaptation projects identified in the NAP (e.g., resilient water systems and infrastructure), but also demonstrate Azerbaijan's leadership in sustainable Islamic finance.

To promote environmentally sustainable initiatives, it is essential to identify and evaluate potential projects for financing through green sukuk, such as those in renewable energy or infrastructure development. Developing comprehensive guidelines for issuing green sukuk is crucial, including certification processes that verify the sustainability impact of the financed projects. Engaging with Gulf region investors will help communicate Azerbaijan's commitment to sustainability and attract their capital through targeted marketing initiatives. Additionally, organising forums and networking events with Gulf-based investment firms can effectively showcase green investment opportunities and foster valuable partnerships.

Recommendation 2: Accelerate Regulation and Licensing for Islamic Banking:

To develop a comprehensive regulatory framework that facilitates the establishment and growth of Islamic banking institutions in Azerbaijan, a dedicated task force should be established within the CBA to oversee the development and implementation of Islamic banking regulations. This task force will conduct stakeholder consultations that include input from local and international Islamic financial experts to understand best practices and tailor them to Azerbaijan's context. Clear licensing procedures for Islamic banks will be defined to align with Sharia principles while ensuring regulatory compliance and consumer protection. Additionally, training programs for existing banking personnel will be introduced to enhance their understanding of Islamic finance principles and practices. By taking these actions, the role of Islamic banking in addressing climate change and disaster risk management can be enhanced, and these efforts can be aligned with the country's green targets.

Recommendation 3: Integrate Islamic Microfinance and Takaful Schemes for SMEs and Farmers into Islamic Finance Agenda

SMEs account for 97.3% of enterprises in Azerbaijan (Ministry of Economy, 2024) and are central to the green transition. There is also significant demand among SMEs indicated by the report KOBİA-SER (2022). Therefore, Islamic microfinance tools, such as qard al-hasan and

murabaha-based green credit, can help farmers adopt drought-resistant crops or energy-efficient technologies. Coupled with micro-takaful insurance, these schemes would provide financial protection against climate shocks such as floods, heatwaves, or crop failures. This dual mechanism—credit plus risk-sharing insurance—would reduce vulnerability among rural and low-income groups, while aligning with Islamic principles of social justice and shared responsibility.

Recommendation 4: Use the Regulatory Sandbox to Pilot Innovative Islamic Green Finance Products

Several conventional banks have applied to the Central Bank’s sandbox for testing innovative products. This controlled environment can be leveraged to pilot Islamic climate finance solutions, such as sukuk-based crowdfunding for community adaptation projects, digital takaful for farmers, or blockchain-enabled tracking of green sukuk proceeds. Testing these products in the sandbox will build market confidence, ensure Shariah compliance, and help regulators identify risks and refine guidelines before scaling them up nationwide.

Recommendation 5: Establish a National Islamic Green Finance Facility Linked to Adaptation Priorities

The 2024 Initial NAP emphasises the need for adaptation financing frameworks. Azerbaijan could create a blended finance facility that pools resources from sukuk, IsDB support, and public funds to finance adaptation in water management, agriculture, and infrastructure. For example, sukuk proceeds could be earmarked for building flood defences in the Kura-Aras basin or supporting irrigation modernisation. By aligning Islamic finance instruments with national priorities, Azerbaijan can attract international investors while ensuring financing flows directly into resilience-building measures.

Recommendation 6: Promote Regional Cooperation on Islamic Climate Finance

The government can promote regional Islamic climate finance partnerships with neighbouring OIC countries (e.g., Türkiye, Kazakhstan, Uzbekistan) to co-develop sukuk issuances, joint takaful pools for disaster losses, or shared research on Shariah-compliant green products. Such cooperation, supported by institutions like the Islamic Development Bank, would not only strengthen Azerbaijan’s role as a Caucasus hub for Islamic finance but also amplify collective capacity to address transboundary risks such as droughts, floods, and Caspian Sea level changes.

3.5. CASE STUDY: UNITED KINGDOM

3.5.1. Assessing the Country Risk for Climate and Natural Disasters

The United Kingdom (UK) rank among the most climate resilient nations globally, positioned 8th in the 2023 ND-GAIN Index, reflecting advanced institutional capacity and adaptation planning. However, it is increasingly vulnerable to intensifying climate-related hazards such as flooding, heatwaves, and coastal erosion (ND-GAIN, 2023). Despite its geographic insulation from extreme tropical events or tectonic hazards, the UK faces growing challenges from hydro meteorological extremes driven by climate change.

3.5.1.1. Recent Disaster Trends in the UK

In recent decades, the United Kingdom has experienced a clear escalation in the frequency and intensity of natural hazards, consistent with global climate change. The trends of natural hazard are well documented in both the UK National Risk Assessment (NRA) and the unclassified National Risk Register (NRR), which guide national emergency preparedness (POST, 2019). The recent concern of disaster in the UK are describe below:

- **Heatwaves** : The UK has seen a marked rise in heat extremes. The unprecedented 40°C event in July 2022 exemplified this shift, contributing to an estimated 3,000 heat-related deaths (UK-HACC, 2025). Projections suggest annual heat-related deaths could exceed 21,000 by the 2070s without significant adaptation.
- **Flooding** : The UK most frequent natural hazard is flood such as river flooding after prolonged rainfall, surface water flooding from overwhelmed drainage systems, and coastal flooding driven by storm surges and sea level rise (POST, 2019). Major flood event in the UK collectively caused billions in damages and highlighted the vulnerability of infrastructure and essential services. Climate models project more intense winter rainfall and higher flood risk, particularly in urban areas (UK Met Office, 2025).
- **Drought and Wildfire** : Hotter, drier summers have intensified drought risk and sparked unprecedented wildfires in peri-urban areas, notably in 2018 and 2022. These events strained water supply systems and emergency response infrastructure.
- **Compound Risk** : Increasingly, the UK is facing cascading hazard events. Flooding that trigger landslides, or heatwaves may intensify drought and spark wildfires, with knock-on effects for health, power supply, and transport infrastructure (POST, 2019). The NRA acknowledges the need to enhance multi-hazard planning, but current frameworks tend to assess hazards in isolation.

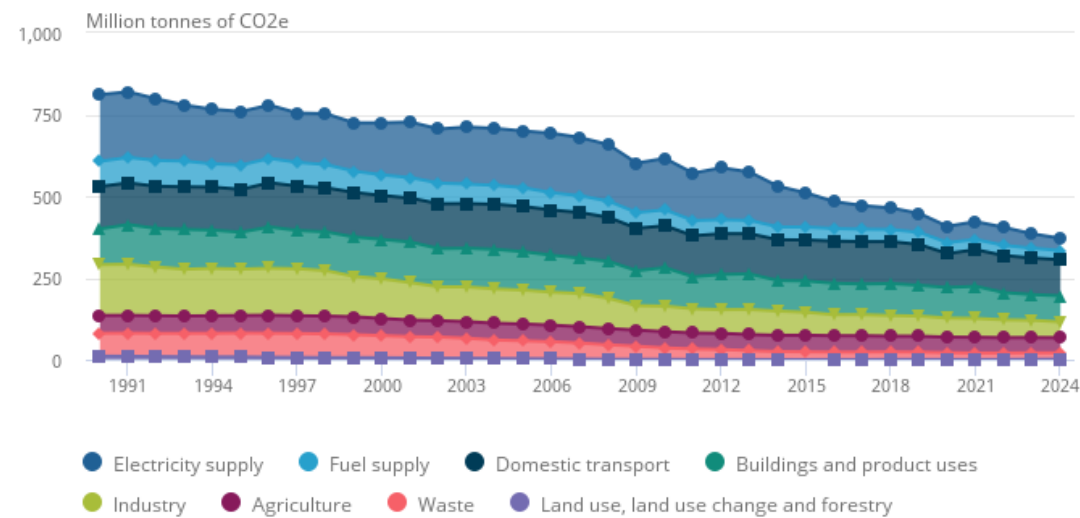
3.5.1.2. GHG Emissions and Economic Impacts

The UK, historically a major emitter during the Industrial Revolution, now contributes only ~1% of global GHG emissions. By 2022, emissions had dropped to around 405 million tonnes CO₂-equivalent, a 48–54% reduction since 1990, driven by a transition from coal to cleaner energy and robust climate policies, including the Climate Change Act (2008) and the legally binding net-zero by 2050 target (GOV.UK, 2023). Emissions have steadily declined over three decades, even as the economy has grown, indicating a successful decoupling of emissions from GDP.

Despite its small emissions share today, the UK faces real economic risks from climate change. A 2022 Grantham Institute study projected UK climate damages could rise from 1.1% to 7.4% of GDP by 2100 under current global policies (Scott, 2022). These impacts include property damage from floods, heat-related productivity losses, and indirect effects like supply chain disruptions. The Office for Budget Responsibility warned that, in a worst-case scenario, public debt could reach ~290% of GDP by 2100 if warming goes unchecked (Scott, 2022).

In contrast, the cost of achieving net-zero is projected to be far lower, around £344 billion net over 30 years, when accounting for energy savings and avoided damages. Figure 31 shows the most significant reductions have come from the electricity supply sector, reflecting the UK's shift away from coal-fired power to renewables and natural gas. Other sectors, such as transport and industry, show more modest declines, but overall trends confirm that decarbonisation is achievable and economically sound.

Figure 31: Top Emitting CO2 in National Communication Sectors on a Teritorial Basis: UK 1990 to 2024 (Provisional)



Source: Provisional UK greenhouse gas emission statistics, Department for Energy Security and Net Zero

3.5.1.3. Vulnerability and Resilience Profile

The UK is widely recognized as one of the most climate-resilient countries. In the 2025 ND-GAIN index, it ranks 8th out of 187 countries with a high overall score of 69.9, reflecting low vulnerability (≈ 0.29) and strong readiness (≈ 0.69) for adaptation. These scores are supported by the UK's robust infrastructure, diversified economy, and public services that reduce exposure and enhance response capacity, especially in sectors like health, water, and food.

The World Risk Index (WRI) 2023 also classifies the UK as medium-low risk, ranking 80th out of 193 countries with a 5.66% disaster risk. While the UK benefits from low exposure and strong coping capacity, it still shows some gaps in long-term adaptive capacity ($\sim 37\%$), indicating room for improvement in future climate readiness, particularly in infrastructure planning for 2050s conditions.

Similarly, the INFORM Risk Index (2023) places the UK in the very low-risk category with a score of 2.2 out of 10, citing strong institutional and infrastructure capacity. However, risks from

floods and extreme weather remain present. The Global Climate Risk Index (1993–2022) confirms the UK is not among the most-affected nations, though recent data show even high-income countries face rising climate-related losses.

Overall, The UK's resilience is strong, however future climate pressures require continued investment. Existing strategies like the National Adaptation Programme and flood defense systems provide a solid foundation, but addressing gaps in long-term adaptive capacity remains essential.

3.5.1.4. Physical and Transition Climate Risks

Climate risks to the UK fall into two categories: physical and transition risks. Physical risks include direct climate impacts such as floods, heatwaves, sea-level rise, and chronic shifts in temperature and rainfall. These are already affecting the UK, with increasing weather-related losses, for instance, winter storms and floods in early 2020 resulted in over £360 million in insured losses in just a few weeks, and straining critical infrastructure, as seen during the 2022 heatwave (BoE, 2022). These risks could lower property values, increase loan defaults, and challenge financial stability (BoE, 2022).

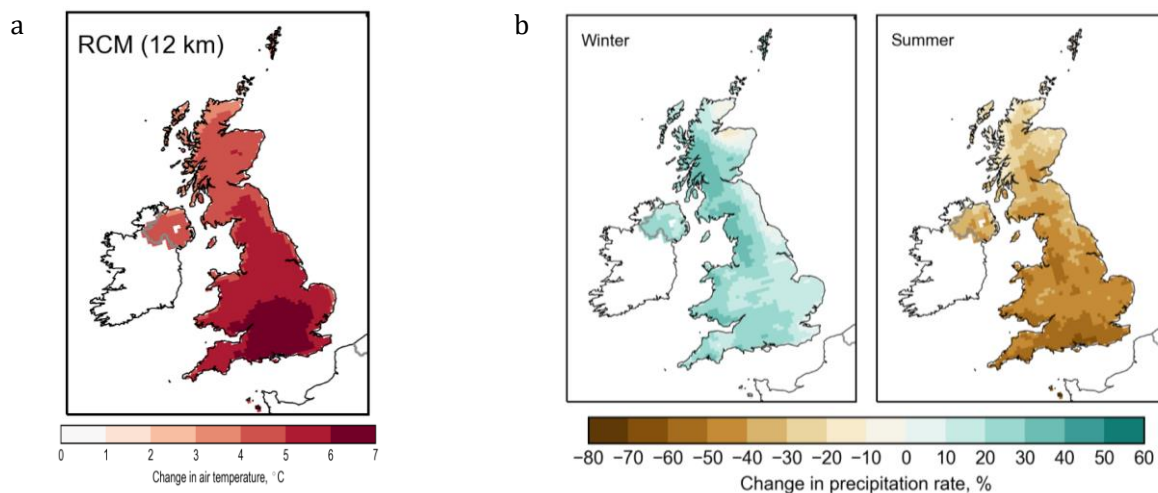
Transition risks, on the other hand, shift to a low carbon model. These include regulatory changes, technological disruption, and shifting investor or consumer behavior. While the UK leads in climate policy, being the first major economy to commit to net-zero by 2050 and policy changes (e.g. phasing out gas heating or petrol cars) still pose risks to carbon-intensive industries (Scott, 2022). The North Sea oil and gas sector, for example, faces declining demand and tightening regulations.

Financial institutions are exposed through lending and investment portfolios. BoE's scenario analysis finds that early, orderly transitions minimize economic shocks, while late or no action leads to more severe disruption. Though green sectors offer opportunity, such as renewables and sustainable finance, managing transition risks is essential to avoid unintended consequences like energy shortages or rapid asset devaluation.

3.5.1.5. Climate Change Projections and Compound Risks

UK climate projections show significant changes this century, even under moderate emissions. By 2041–2060, the UK is expected to warm by 1.5–2.0°C above the 1981–2000 baseline, with wetter winters, drier summers, and sea-level rise between 3–37 cm (CCC, 2020). Some impacts are already unavoidable due to past emissions.

Figure 32: (a) Projected change in summer air temperature period 2060-2080 relative to 1981–2000 for RCM 12km. (b) Change in seasonal mean precipitation (%) from present-day to the period 2060-2080, left panel, December to January, right panel, June to August



More extreme seasons are anticipated. Winters will likely be milder and wetter, while summers become hotter and drier. Heatwaves like in 2018 may become regular post 2050 (UK-HACC, 2023). Projections from the UKCP18 12 km Regional Climate Model, developed by the Met Office Hadley Centre using the high-emissions RCP8.5 scenario, offer detailed spatial insight into these trends. As shown in Figure 32 (a), much of England could experience summer temperature increases of 4.5°C to 6.5°C in 2060-2080 relative to 1981–2000, with the greatest warming expected in central and southern regions. The rainfall are prone to shift, in Figure 32.(b) average winter precipitation is projected to rise by 10–30%, especially in western and northern areas such as Wales and Scotland. Meanwhile, summer rainfall may decline by 30–60% in regions like Southeast England and East Anglia. This intensification of seasonal contrasts will increase the likelihood of both winter flooding, due to saturated soils and heavier rainfall, and summer droughts, with implications for crop viability, wildfire frequency, and water supply reliability (Met Office, 2025).

If global mitigation falls short, UK warming may exceed 5°C by 2100, with sea-level rise reaching 0.5–1 meter (UKCP18, 2018; DAERA, 2025). These changes threaten infrastructure, agriculture, health, and water resources. Risks will also become more compound, for instance, dry summers may trigger wildfires, followed by winter storms causing floods, or heatwaves could strain both energy and water systems simultaneously.

The UK Climate Change Committee emphasizes that adaptation is essential regardless of global action. Planning must assume 2041–2060 conditions as the baseline, with resilience measures like improved flood defences, drought preparedness, and emergency systems ready for simultaneous, cascading climate impacts. Without strong mitigation and adaptation, future extremes may surpass anything previously experienced.

National risk assessment framework

The UK has a structured and legally mandated approach to assessing climate risks through its Climate Change Risk Assessment (CCRA), published every five years under the Climate Change Act 2008. The latest CCRA3 (2022) warns that without timely action, climate-related impacts such as flooding, heatwaves, and coastal erosion, could cause over £1 billion in annual damages across at least eight key risk areas by 2050 (HM Government, 2022).

The latest CCRA3 (2022) evaluated 61 risks and opportunities, ranging from impacts on the natural environment and infrastructure to risks to human health and supply chains. It highlighted a set of priority risk areas requiring urgent action, building on previous assessments. The independent advisors (UK Climate Change Committee) warned that in eight priority areas, such as risks to biodiversity, soil health, and infrastructure from flooding, the gap between risk and adaptation effort is widening. The evidence showed that current adaptation actions in the UK are failing to keep pace with the increasing risks, implying that more ambitious and faster responses are needed despite the UK's strong capacities.

Importantly, the UK also considers indirect risks, such as disruptions to food imports from climate vulnerable regions. With rising extremes, even existing flood defenses and urban infrastructure may be insufficient, pointing to the need for continuous updates and cross-sectoral resilience planning.

3.5.2. The Trajectory of Green Finance: Institutionalization, Legal and Regulatory Framework, and Financial Standing with Particular Reference to Climate Risk Mitigation and Natural Disasters Preparedness

Institutional Arrangement

The United Kingdom has established a comprehensive institutional architecture to promote green finance and safeguard stability in response to climate risks. The strong institutional arrangements have significantly contributed to the country's environmental achievements, including a 50% reduction in greenhouse gas (GHG) emissions between 1990 and 2022, largely driven by a phased transition away from coal. Notably, the UK became the first G7 country to eliminate coal-fired power generation (IMF, 2024; DESNZ & MP, 2024). In 2022, the UK submitted an enhanced Nationally Determined Contribution (NDC), committing to reduce GHG emissions by at least 68% by 2030. This target was further raised to 81% by 2035 at COP29 (UK, 2024; IMF, 2024).

The UK maintains a net-zero goal by 2050, underpinned by strong policies and climate finance commitments. The UK (2024) was also the first nation to establish government climate initiatives and national emission targets under the 2008 Climate Change Act, mandating the establishment of an independent Climate Change Committee (CCC) to assess adaptation progress, advise the government, and oversee the Climate Change Risk Assessment (CCRA) and National Adaptation Programme (NAP). Initially aimed at an 80% emissions reduction by 2050 (from 1990 levels), the Act was amended in 2019 to strengthen this to a 100% reduction. The Net Zero Strategy, issued in 2021, provides a framework to monitor progress on carbon budgets, NDCs, and the broader vision of a decarbonised economy by 2050. Climate adaptation is devolved across the UK's four nations, with His Majesty's Government (HM Government) integrating adaptation into national policies such as energy security and foreign affairs. The 2030 Strategic Framework for International Climate and Nature Action further shapes the UK's global climate role (HM Government, 2023a).

Financial Sector Governance and Regulation

At the core of the UK's green financial system is the Bank of England (BOE), which serves as the central bank and macroprudential authority. Through its Financial Policy Committee (FPC) and Prudential Regulation Authority (PRA), the BOE (2022) supervises systemic risks and oversees financial institutions, ensuring financial stability while supporting environmental sustainability as a secondary mandate in line with the economic policy of the government.

Financial sector authorities in the UK have integrated climate considerations into prudential regulations and country-level risk assessments. The Bank of England (BOE) has been at the forefront of this agenda. In 2021, it launched the first Climate Biennial Exploratory Scenario (CBES) exercise to assess the resilience of major banks and insurers under various climate stress scenarios. The CBES results illustrated that climate change could materially undermine financial stability if unmonitored. The findings were instructive: in a "late action" transition scenario, credit losses were projected to be 30% higher compared to an "early action" pathway, translating into approximately £110 billion in additional losses over a 30-year horizon, most of which would materialize within the first five years of transition. Under a "no additional action" scenario, physical climate risks, such as flood-related damages and storm impacts, would result in even greater financial distress. Insurers and banks would face considerable losses from declining asset values and impaired credit portfolios. Life and general insurers, in particular, would experience surging claims, with damages from extreme weather events projected to increase up to fourfold. In a second-round impact, vulnerable households and businesses would be especially hard hit in this no-action scenario, as rising insurance costs and credit impairments transmit climate shocks to the broader economy. These findings reinforce the UK's recognition that climate change is a systemic financial risk, not just an environmental issue.

Recognizing the systemic nature of climate risk, the UK has established a comprehensive legal and institutional framework to guide climate adaptation, which includes the Climate Change Act 2008.

In 2022, the BOE (2023) released its Climate Transition Plan (CTP), which sets out a pathway to reduce its own operational emissions by 90% by 2040. The PRA has issued supervisory expectations requiring financial firms to integrate climate-related financial risks into their risk management, governance, and business planning frameworks (BOE, 2025). The Monetary Valuation of Risks and Opportunities in the third Climate Change Risk Assessment emphasizes the value of early adaptation measures, noting benefit-cost ratios of 2:1 to 10:1 for investments like flood defenses, heatwave early warning systems, and climate-resilient infrastructure. In practical terms, every £1 invested today in adaptive infrastructure could generate between £2 and £10 in future economic benefits.

In term of regulatory framework, the Financial Conduct Authority (FCA) plays a complementary role by regulating conduct and transparency across financial markets. The FCA has been instrumental in setting climate disclosure requirements (for example, mandating TCFD-aligned reports for listed companies and asset managers) in their handbook to ensure market participants address environmental risks (FCA, n.d.).

Coordination between these key institutions is formalized through various mechanisms. HM Treasury (HMT), the UK's finance ministry, provides strategic direction on sustainable finance. The regulators also collaborate via forums and expand outreach to its key stakeholders, including the joint Climate Financial Risk Forum (CFRF), an industry-regulator working group launched in 2019 (FCA, 2024). The CFRF, facilitated by FCA and PRA, brings together banks, insurers and asset managers to develop best practices on climate risk management.

The UK's institutional framework benefits from clear delineation of responsibilities: the BOE for macro/microprudential supervision, the FCA for market integrity, and HMT for fiscal policy, supported by strong inter-agency cooperation on sustainability and climate policy.

Integration of Islamic Finance within the Green Finance Ecosystem

The Islamic finance sector in the UK operates under the same regulatory regime as conventional financial institutions, ensuring a level playing field within a secular, principles-based legal framework. Regulatory oversight is shared between the PRA (which is part of the BOE) and FCA, with no separate regulatory regime for Islamic finance. The authorities emphasise a non-discriminatory approach to avoid regulatory arbitrage (Rahman, 2017). Islamic financial institutions are required to comply with standard financial regulations and are also responsible for their own Shariah governance, typically overseen by internal Shariah Supervisory Boards (SSBs). The UK authorities have made specific accommodations to support Islamic finance, including adjustments to tax laws to ensure equal treatment and regulatory authorisation of Islamic banks within existing banking law.

The UK authorities have taken steps to accommodate Islamic finance within the legal and regulatory system, including adjusting tax laws to ensure equal treatment, and authorizing Shariah-compliant banks under the existing banking law (British Embassy Bishkek, 2015). In a notable development, the BOE (2021a) established an Alternative Liquidity Facility (ALF) in 2021, a non-interest-based deposit facility that allows UK Islamic banks to hold reserves in a Shariah-compliant manner. This initiative demonstrates the UK's commitment to institutionalizing Islamic finance practices (particularly important for liquidity management and financial stability) within its conventional framework. This pragmatic, integrated approach has positioned the UK as the leading international centre for Islamic finance outside the Muslim world. The absence of a centralised Shariah authority is offset by institutional flexibility and robust governance, allowing for effective Shariah compliance within a conventional legal and financial system. In addition, the UK Islamic finance firms appoint Sharia scholar or Supervisory Board of Islamic scholars to ensure their Sharia compliance activities and products (TheCityUK, 2022).

Financial Sector Development and Green Finance Market Leadership

The UK's financial sector, among the largest globally, has emerged as a leader in sustainable and green finance. The country is often ranked first globally for sustainable finance development, planning to become 'sustainable finance capital' in the world, reflecting the depth of its green financial markets and supportive policies (Department for Energy Security and Net Zero et al., 2025). London's capital markets play a pivotal role as the London Stock Exchange (LSE) serves as a key venue for green bonds and Sukuk listings. Since the establishment of its Sustainable Bond Market (SBM) in 2019, the LSE has supported over £300 billion in green, social, and sustainability-linked bond issuances (LSEG, 2024). This includes a wide array of instruments from around the world, including green bonds financing renewable energy, sustainability-linked bonds, and sovereign green Sukuk issued by other countries. As of mid-2024, the LSE is the third-largest listing venue for US-dollar Sukuk globally, hosting about 35% of global outstanding USD-denominated Sukuk (or around \$80 billion).

Collaborative efforts between the London Stock Exchange Group (LSEG), the Islamic Development Bank (IsDB), and the International Capital Market Association (ICMA) have led to the development of practical guidance on Sustainable Sukuk issuance, launched in April 2024. This initiative, rooted in partnerships fostered by the High-Level Working Group on Green

Sukuk (HLWG), demonstrates the UK's capacity to serve as a global platform for Islamic finance and climate-aligned finance.

London is the western hub of Islamic finance due to its deep liquidity, global reach, initiative, robust regulatory standards, and use of English law in structuring Sukuk contracts (English common law is the governing law for most international Sukuk) (Fitch Ratings, 2024). The UK is home to five Islamic banks, all with GCC ownership, including the latest acquisition of Ahli United Bank (UK) PLC by Kuwait Finance House PLC. Islamic banking remains a niche but growing segment domestically. Islamic banks held only 0.1% of the UK banking system assets at end-2023 due to demand and supply constraints, including small UK's Muslim population and limited awareness, as well as narrower products, limited branches and lack of competitiveness compared to conventional banks (Fitch Ratings, 2024). Nevertheless, it has reached 26% (y-o-y) growth in 2023 to USD8.2 billion and predicted to grow to \$15 billion in the medium term as awareness rises, conversion of Islamic bank operation and continued asset growth as well as supportive regulations. However, the country's role is less about domestic retail volume and more about being a global Islamic finance marketplace and service provider. According to the latest Islamic Finance Development Indicator (IFDI) by LSEG, the country ranks highly in Islamic finance knowledge and sustainability metrics, indicating strong alignment between UK's Islamic finance initiatives and ESG goals. Additionally, the UK is among top Western jurisdictions in the index, outperforming other non-OIC countries (after Philippines).

Policy and Regulatory Framework for Green Finance and Climate Resilience

The UK government and financial regulators have implemented a robust policy framework to promote green finance, climate risk mitigation, and disaster preparedness, spanning both the conventional and Islamic finance spheres:

- **Government Strategy and Green Bonds:** The UK Government has been proactive in harnessing capital markets for climate objectives. In 2021, HM Treasury issued the first country's Sovereign Green Bonds ("Green Gilts"), raising £16.1 billion in the first year across two issuances, aiming to build a 'green yield curve', financing in clean transportation, renewable energy, flood defenses, and other low-carbon infrastructure (UK Debt Management Office, n.d.). By 2022-2023 the UK had expanded Green Gilt issuance to a total of £26 billion, and in 2023-2024 £10.9 billion was raised via green gilts and retail Green Saving Bonds. So far, the Green Financing Programme has accumulated £43.4 billion as of October 2024 since September 2021 from green gilt issuance (£41.6 billion) and Green Savings Bonds (£1.8 billion) (HM Treasury, 2024a). The success of Green Gilts has not only raised affordable financing for domestic climate investments but also signaled to markets the UK's commitment to leadership in sustainable finance. To guide the issuance process, the UK Green Financing Framework (published June 2021) governs these issuances, ensuring proceeds are allocated to eligible green expenditures and committing to transparent allocation and impact reporting. In addition, to improve market transparency and ensure accountability, the UK has annually issued UK Green Financing Allocation Report.
- **Financial Regulatory Initiatives and Assets:** UK regulators have integrated climate considerations into supervisory expectations and market rules. The BOE is leading in the 7th position of Green Central Banking Scorecard amongst G20 members of their progress towards environmental commitments, particularly in the areas of research and advocacy, financial policy, leading by example and monetary policy (Green Central Banking, n.d.). BOE is one of the first movers in incorporating climate considerations in their monitoring and

supervision framework. Some actions taken including incentivizing corporate bond scheme to support climate friendly companies, disclosing climate-related financial risks, undertaking climate stress scenario exercise, and incorporating green gilts eligible in market operations. In the area of financial policy, some requirements are established for financial institutions to disclose transition plans as part of sustainable disclosure requirements (SDR), mandatory TFCF disclosure for banks and insurers and integration of climate risk into risk management practices. The implementation of TFCF disclosure was also extended to cover wider range of financial institutions by FCA, including UK premium-listed companies and certain standard-listed issuers, asset managers, life insurers and pension (HM Government, 2021). The extensive disclosure requirements were making the UK leadership in the global adoption of TFCF reporting and *mandatory* climate reporting. Furthermore, FCA also coordinated with HM Treasury on the development of sustainable investment labelling regime. BOE and FCA are also active in multilateral for a, such as the Network for Greening the Financial System (NGFS) and FCA has also collaborated with the IFRS Foundation to establish ISSB. In addition, the establishment of UK Centre for Greening Finance and Investment (CGFI) was also supporting the leading role of UK in green finance, particularly for accelerating adoption and use of climate and environmental data.

- **Climate Stress Testing and Risk Analytics:** The UK's approach to disaster preparedness in finance relies on advanced risk analytics. BOE's climate stress test (CBES) covers three scenarios of both transition and physical risks based on the subset of NGFS climate scenarios, but expanded by adding risk transmission channels and variables aligns with the country's circumstances based on consultations with climate scientists, academics, and industry experts. This stress test is frequently conducted to assess the financial system and individual institution resiliencies. The CBES exercise has become a reference to other central banks study.
- **Green Taxonomy and Standards:** To support investment and prevent "greenwashing," the UK is developing Green Taxonomy, a classification system for sustainable economic activities to support investment decisions (HM Treasury, 2024b). The public consultation, taken place from November to early February 2025, aimed to explore the need of additional classification to support the existing policies. Nevertheless, global interoperability will be considered in the development in addition to local economic characteristics and specific transition pathways. In the interim, the UK has endorsed global voluntary frameworks, such as the ICMA Green Bond Principles. and continued to support the ISSB work. In 2023, the government's updated Green Finance Strategy and committed to consulting on the introduction of mandatory disclosure of transition plans for UK's largest companies (HM Treasury et al., 2023).
- **UK Emissions Trading Scheme (UK ETS):** UK ETS plays integral part in emissions reductions and accelerating green investment. It was established in 2021 and has supported decarbonization strategy by setting emission limit and setting carbon price that provide incentives for business in reducing their emissions align with the pace required to support national climate goals.
- **Monetary Policy and "Greening" Central Banking:** The Bank of England has also integrated climate goals into certain monetary operations. In November 2021, it announced the Corporate Bond Purchase Scheme (CBPS) portfolio. The BOE set criteria to tilt purchases toward companies with stronger climate performance within their sectors, aiming to cut the portfolio's carbon intensity by 25% by 2025 (BOE, 2021b). Companies are assessed on

metrics like emissions intensity, emission reduction progress, disclosure publication and emissions target.

- **Market and Industry Initiatives, including Islamic Finance and Green Integration:** As a market initiative, the Green Finance Institute (GFI) was established in 2019 as independent advisor to the Government to accelerate green finance, address market challenges and develop solutions. In Islamic finance, the UK Islamic Finance Council (UKIFC) has been a key catalyst, working with global partners to align Islamic finance with sustainability. The UKIFC in collaboration with HM Treasury, Indonesian Ministry of Finance, Islamic Development Bank (IsDB), LSEG and the Global Ethical Finance Initiative (GEFI) established a High-Level Working Group on Green Sukuk (HLWG) to unlock Islamic finance potentials to achieve Paris Agreement targets during COP26. Two members of HLWG, LSEG and IsDB, in partnership with International Capital Market Association (ICMA) published the Guidance on Green, Social and Sustainability Sukuk in April 2024 to facilitate the sustainable sukuk market.

3.5.3. Financing Provisions for Climate Risk Mitigation and Natural Disasters Preparedness: Institutions, Products, and Offerings

The UK's Global Role in Climate Finance Leadership

The United Kingdom (UK) has positioned itself as a global leader in climate finance and sustainable investment. As part of its international commitments, the UK allocated £5.98 billion in International Climate Finance (ICF) between 2016 and 2021, and a further £11.6 billion for the period 2021–2026. These funds are targeted toward supporting developing countries in implementing low-carbon transitions, building adaptation capacity, strengthening climate resilience, and addressing loss and damage. In addition, UK Partnering for Accelerated Climate Transitions (UK PACT) supports ODA-eligible countries with high mitigation potential to increase their climate ambitions and effective and equitable implementation. Under its COP26 presidency, the UK led efforts to deliver the climate finance delivery plan, contributing to the mobilisation of USD 115.9 billion in 2022 (UK, 2024).

The UK was the first country to publish a Green Finance Strategy in 2019, with a major update in 2023. The Strategy promotes green investment, strengthens climate resiliency in the financial system, and aligns global financial flows with the Paris Agreement (HM Government, 2023b). It provides a comprehensive framework to develop enabling ecosystems, including green taxonomies, ESG data infrastructure, sustainable financial advice, and climate literacy. Furthermore, the London Stock Exchange pioneered issuing green bonds, with the issuance of £120 billion and a public carbon market framework.

Despite reducing its share of global emissions from 2.5% in 1990 to around 1% in 2024 (IMF, 2022; 2024), the UK continues to face domestic climate risks, including extreme weather events (e.g., severe flooding), transition risks from global carbon pricing changes, and uncertainty from policy shifts. The relaxation of certain policies in 2023, such as delaying gas grid decarbonisation, raised concerns about the country's ability to meet its 2030 targets, reinforcing the need for strong regulatory continuity and vigilance (IMF, 2024).

Institutional Integration and Islamic Finance Potential

The UK has taken a global leadership role in integrating climate risk into financial regulation and supervision. Financial authorities, including the BOE, FCA, and PRA, have introduced mandatory disclosure requirements, aligned with the TCFD and other international standards. These initiatives have enhanced transparency, strengthened resilience, and guided capital allocation

toward climate-aligned assets. Importantly, the UK is also the most established centre for Islamic finance in the Western hemisphere, with five licensed Islamic banks and several conventional institutions offering Islamic financial products through dedicated windows. Since the mid-1990s, the UK government has introduced legal and tax adjustments to ensure a level playing field for Islamic financial institutions. The UK is one of the few non-Muslim-majority countries to issue sovereign sukuk, and London serves as a platform for global sukuk listings, legal arbitration, and Islamic fintech innovation. Hence, the UK has critical potential offerings for climate finance through Islamic finance as it has a proven successful climate and sustainable development finance record.

Financial Standing and Climate Resilience

The collaborative efforts have resulted in resiliency of UK's financial system against climate-related financial risk. In the latest BOE's assessment, UK banks and insurers are progressing in climate risk management, despite there is still a need to understand and manage exposure to climate risk.

On the financing side, the UK has seen rapid flows of green finance. By 2023, over 70% of FTSE 100 companies had voluntarily published elements of climate transition plans (DESNZ et al., 2025), and the sustainable investment sector in the UK was scaling up supported by conducive regulatory environment. London stock market remains one of the global top issuance centers for green bonds. In 2024, \$56 billion was raised in London Stock Exchange's Sustainable Bond Market (Environmental Finance, 2025). The UK's two sovereign Sukuk issuances (in 2014 and 2021) have built its reputation as the leading Western hub for Islamic finance, marked with oversubscribed and priced competitively, demonstrating investor appetite for Shariah-compliant assets.

The scale of investment required to reach UK climate targets is vast, on the order of £130 billion per year of additional green investment may be needed through 2050 to align with net zero scenario, supported from private sector. Mobilizing private capital at this scale will require continued innovation in financial products, which could potentially use the Islamic finance instruments, including green sukuk or Islamic social finance tools like green waqf funds. The UK's regulators have so far favored building regulatory and infrastructure toward disclosure and moral suasion over hard mandates, such as green lending quotas or capital charges, due to prudential concerns.

Despite the UK's leadership, the scale of green investment required remains significant. Estimates suggest the UK will need an additional £130 billion per year in green investments through 2050 to meet its net-zero commitments (DESNZ, 2025). Achieving this will depend heavily on private sector mobilisation, which in turn relies on financial product innovation, cross-sectoral partnerships, and regulatory certainty. There is growing interest in leveraging Islamic financial instruments, particularly green sukuk for resilience, to crowd in capital from values-based investors. The UK's experience demonstrates that these instruments can be effectively integrated within a conventional legal and regulatory environment, offering models for OIC countries seeking to diversify their financing base while aligning with Shariah principles.

To date, UK regulators have taken a principles-based approach, favouring disclosure, market guidance, and collaboration over prescriptive mandates such as green lending quotas or differentiated capital charges. While this approach encourages market-led innovation, it also requires strong supervision to prevent greenwashing and ensure effective risk management.

3.5.4. Best Practices: Lessons Learned

The UK case offers several best practices for green finance and climate risk management that could be instructive to other countries, including OIC members:

- **Strong Legal Commitments:** A first mover and binding long-term climate law (Climate Change Act), comprehensive strategies and monitoring framework, as well as mandated risk assessments create policy certainty. This has directed financial sector attention to climate risks as real and material, not just corporate social responsibility, as well as public support toward transition to a low carbon economy. It also ensures governments periodically evaluate worst-case scenarios and update adaptation plans.
- **Regulatory Clarity and Integration:** UK regulators have the mandate on climate which provide accountability for policy development for financial institutions. The UK's approach shows the value of integrating climate risk into existing supervisory frameworks (stress tests, capital planning) rather than treating it as a separate silo. Regulators also coordinate across prudential and conduct sides to prevent regulatory gaps.
- **Strong stakeholder engagement:** The UK Government consulted with a wider range of stakeholders (including industry, regulators, sector bodies and others) in setting up the NDC ensuring support and contribution toward transition to net zero. Furthermore, the UK Government will publish a Public Participation Strategy to encourage greater public engagement in 2025, which serves as a key component in broader efforts to achieving its NDC target. The strategy will focus on supporting people to adopt new technologies, incorporating public views into policymaking, engaging with local communities and vulnerable groups, and building trust and confidence.
- **Market Development through Sovereign Leadership:** The UK's swift entry into the green bond market with large, liquid sovereign issues created a benchmark and helped build a green yield curve in sterling. This has also encouraged private sector issuance supported by the strong demand and strong regulatory framework.
- **Transparency and Reporting:** The UK emphasizes high-quality reporting, such as supported by the annual UK Green Financing Allocation Report, or the disclosure requirement for companies. This transparency builds investor trust, helps track progress and improves governance.
- **Global Collaboration:** The UK has leveraged its international role (e.g. as host of COP26 in 2021 and through co-chairing international coalitions) to push for common standards and knowledge-sharing. The BoE was a founding member of the Network for Greening the Financial System (NGFS), and the UK was early to endorse the TCFD. Its experience shows that contributing to global public goods (standards, frameworks) can enhance a country's domestic financial stability by raising the bar internationally and reducing fragmentation. The UK's work in blending Islamic finance with ESG, such as the high-level Green Sukuk working group, demonstrates a creative coalition approach that other nations can adopt to tap diverse investor pools.

3.5.5. Country-Specific Policy Recommendations

The United Kingdom provides a compelling example of how a country can systematically institutionalise green finance within its broader financial system to advance climate risk mitigation and natural disaster preparedness, with a potential development of Islamic finance tools in the effort. Through a combination of clear policy frameworks, regulatory innovation,

and collaborative engagement with global markets, the UK has demonstrated that aligning financial systems with climate objectives is both feasible and beneficial.

The UK's experience highlights that embedding sustainability into finance requires a multi-dimensional and integrated approach, encompassing macroprudential tools (such as central bank stress testing), policy consistency across institutions, the development of enabling infrastructure (e.g., disclosure standards, green taxonomies), and the potential integration of Islamic finance instruments. This integrated strategy has not only positioned the UK as a leader in sustainable finance but has also contributed to the resilience and stability of its financial system in the face of increasing climate-related risks. Importantly, the UK's model illustrates that conventional and Islamic financial practices can coexist and reinforce each other in promoting inclusive, climate-aligned development.

For OIC Member Countries, the UK example offers valuable insights into the financial sector's role in climate risk integration, the benefits of long-term adaptation planning, and the importance of robust institutional arrangements. Although contexts vary, the imperative remains common: addressing climate risk is not only an environmental necessity, but a core component of safeguarding economic stability and sustainable development. On this note, the UK's experience offers a practical and adaptable reference for developing comprehensive financial sector strategies that promote climate resilience, financial inclusion, and sustainable development, leveraging both green finance and Islamic finance as mutually supportive pillars.

CHAPTER 4: POLICY RECOMMENDATIONS AND ROAD MAP

Islamic moral political economy re-emerged in the postcolonial era to address crises across various domains of life (individual, society, economy, ecology). Its aim is to develop a corrective mechanism (*islah* or reclamation) to rescue humans, society, ecology, and even capital from domination by incorporating the interests of all stakeholders (*tawhidi* condition) into every decision and transaction.

In the current junctures of humanity, the severity of crises has increased, leading to new risk areas, including climate risk and emerging types of disasters, which have contributed to the rise of 'risk society' as the operational nature of post-normal times with the deepening of the VUCA (volatility, uncertainty, complexity and ambiguity) world.

In responding to such crises, the transition towards a low-carbon, climate-resilient economy, along with advances in disaster risk reduction, offers both significant challenges and strategic opportunities for OIC Member Countries. While Islamic finance is based on principles of environmental stewardship, social justice, and ethical investment emanating from Islamic moral political economy, its potential to act as a catalyst for climate action and disaster risk mitigation remains largely underutilised.

This chapter translates the preceding analysis of Islamic finance's role in mitigating climate change and natural disasters into concrete, actionable steps for policymakers, regulators, multilateral institutions, and market players within OIC Member Countries. The recommendations focus on promoting sustainable and eco-friendly Islamic financial products as strategic tools to lower climate risks, bolster disaster risk reduction (DRR) efforts, and advance the Sustainable Development Goals (SDGs) across these countries.

Recognising the diversity of economies among OIC Member Countries — ranging from high-income nations with advanced capital markets and strong financial capacity to low-income members vulnerable to climate change and natural disasters, with developing financial systems — the roadmap offers customised strategies. It also highlights the importance of regional cooperation within the OIC, focusing on harmonising standards, exchanging knowledge, and sharing resources.

The proposed approach emphasises establishing an enabling environment founded on robust policy frameworks, aligned taxonomies, dependable market infrastructure, comprehensive data ecosystems, and sustained innovation. This combination is essential to mobilise the necessary scale of finance for a fair, inclusive, and effective climate transition and DRR in Islamic countries.

Previous chapters demonstrate that climate change and natural disasters pose systemic risks to OIC Member Countries, significantly affecting financial stability, food security, public health, and essential infrastructure. At the same time, there is a large gap in financing needed for climate mitigation, adaptation, and disaster risk reduction. This deficit is particularly critical for low-income, climate-vulnerable, and disaster-prone members, hindering their capacity to build resilience and respond effectively to increasing climate-related threats, such as natural disasters.

While Islamic finance has made certain level of inroads into the sustainable finance space, its integration into climate risk management and DRR, as well as its market scale, remains limited compared to conventional finance markets. Factors such as insufficient awareness, fragmented taxonomies, and limited green project pipelines have slowed progress. It is also important to note that having Islamic finance compelled to converge with conventional finance limits its potential to be a dynamic alternative for climate risk mitigation and supporting DRR.

While efforts must be made to recalibrate the relationship between humans, society, the economy, and ecology within the framework of Islamic moral political economy, bridging these observed gaps in the foreseeable future requires prompt, coordinated actions that harness the key strengths of Islamic finance—such as asset backing, risk sharing, and avoiding harmful activities—while also adopting best practices in green finance globally. Incorporating climate considerations into regulatory frameworks, fostering cross-sector innovation, and enhancing market transparency will strengthen Islamic financial instruments, making them credible, competitive, and effective tools for advancing the climate transition.

4.1. Detailed Policy Recommendations

The following recommendations build on the findings in previous chapters, starting with building blocks and are tailored to the capacities and development stages of OIC Member Countries. Each recommendation is broken into strategic objectives, key actions, responsible stakeholders, and indicative timelines, ensuring they are actionable and measurable.

4.1.1 Key Building Blocks for Policy Recommendation Development

1. Legal and Regulatory Frameworks

OIC countries require harmonised, transparent, and enforceable regulations that support green Islamic finance, officially recognising climate-related risks and DRR, alongside sustainable investment goals.

- **Enhancing Regulatory and Supervisory Frameworks for Sustainable Finance:** develop robust regulations specific to green, climate, and DRR-linked Islamic finance (including green sukuk), ensure alignment with international ESG standards, and incorporate climate risk assessment into financial oversight.
- **Improving Regulatory Framework for Green Sukuk:** Address the legislative and technical gaps for issuing green sukuk by defining eligible projects, standardising reporting, and mandating third-party verification.
- **Integrating DRR and Climate Financing, including Islamic Finance, into the National Development Plans of OIC Member Countries:** Incorporate Islamic financial instruments such as Green Sukuk, takaful, and Islamic social finance tools into the Financial Agenda. Mandate the inclusion of green sukuk and ESG-linked products in national financing strategies to harness Islamic finance for sustainable development.

2. Product and Market Development

Market-driven innovation, product diversification, and clear frameworks for new green Islamic instruments are necessary to meet climate and DRR financing demands and attract private investment.

- **Further Unlocking Corporate Sukuk Market Potential:** Support corporate green sukuk issuance through simplified processes, market education, and clear pipelines of eligible green projects.

- **Diversification Of Islamic Financing Contracts And Sukuk Models:** Promote innovation in products (e.g., resilience-linked sukuk, ESG-compliant musharakah, murabaha), adapting them to address various climate adaptation and mitigation requirements.
- **Promoting Innovative Financing Models:** Pilot and scale blended finance, syndicated green financing, and risk-sharing structures unique to Islamic finance to fund climate solutions.
- **Innovating Adequate Green Shari'ah-Compliant Products:** Encourage financial institutions to design new Shari'ah-compliant climate adaptation and DRR solutions, engaging scholars and stakeholders in the product development process.
- **Introducing The Syndicated Green Financing Framework:** Developing standardised consortium models for large green projects, allowing Islamic banks to share risks and scale climate investments.
- **Developing And Incentivising Green And Resilience-Linked Islamic Financial Products:** offer fiscal or regulatory incentives for creating and adopting green products (e.g., tax benefits, green asset ratios).
- **Reconsidering The Role Of Islamic Social Financial Instruments In DRR And Climate Resilience Financing:** Strengthen regulatory frameworks to effectively integrate and operationalise these tools within national and regional DRR agendas.
- **Developing policies to strengthen the role of takaful and re-takaful for DRR in OIC Member Countries.**
- **Establishing a dedicated Islamic finance disaster risk and climate resilience fund as well as sukuk-based platforms to attract private sector and community investments.**

3. Capacity Building, Awareness, and Confidence

Wide-reaching efforts are needed to raise understanding among all stakeholders and build the technical capacity for designing, promoting, and monitoring green financial products.

- **Increasing Capacity Building and Literacy for Issuers and Investors:** Invest in capacity building for Islamic finance experts specialising in disaster risk and climate resilience. Launch specialised training programmes for Islamic banks, regulators, and investors covering green finance, climate risk, ESG reporting, and impact measurement.
- **Raising Awareness and Enhancing Public Education on the Role of Islamic Finance in Climate Resilience and DRR Financing:** Launch national awareness campaigns and incorporate climate and DRR finance into Islamic finance curricula at academic and professional levels.
- **Boosting investor confidence by increasing transparency, improving disclosure, and enabling independent verification of green credentials in Islamic finance products.** Additionally, promote success stories to foster trust.

- Building Capacity and Raising Awareness: Collaborate with international agencies, universities, and civil society to share knowledge and develop technical expertise.

4. Incentives Mechanism and Collaboration

Policy incentives combined with active collaboration among states, industries, and international partners are crucial to driving large-scale climate-aligned and DRR investments.

- Implementing Fiscal, Macroprudential, and Microprudential Incentives: Deploy tax incentives, credit guarantees, or reduced capital requirements to encourage banks and issuers to offer green Islamic finance products for climate and DRR financing.
- Developing Incentive Mechanism/Collaborative Efforts: Forge cross-sectoral collaborations (public-private, multilateral) and implement co-investment platforms to de-risk climate and DRR investments and share best practices.
- Fostering Public-Private Partnerships and Cross-Sectoral Collaboration: It is essential to strengthen coordination among government ministries, financial authorities, Islamic financial institutions, and private sector stakeholders to establish comprehensive project pipelines and expand green investment initiatives. Such collaboration can enhance climate resilience and disaster risk reduction through the development of innovative Islamic financial instruments specifically designed to finance DRR and climate change adaptation and mitigation efforts. Priority areas might include investments in early warning systems and other preventive and mitigation infrastructure that support climate risk management.

5. Market Infrastructure and Impact Monitoring

Strengthening the market infrastructure and leveraging technology will establish credibility, increase investor trust, and facilitate wider access to sustainable Islamic finance.

- Develop and promote the shallow secondary market for Green Sukuk by building infrastructure, such as trading platforms and market makers, to enhance liquidity and transparency, thereby attracting a broader spectrum of investors.
- Monitor, evaluate, and report impact by implementing standardized reporting, impact assessments, and independent certification for green Islamic products to promote transparency and accountability.
- Leveraging technological innovation by involving the utilisation of fintech, regtech, and blockchain to simplify the issuance of green products, improve traceability, broaden access, and support impact measurement.
- Reevaluating the Role of Islamic Social Financial Instruments in Funding Climate Resilience and Disaster Risk Reduction: These instruments have significant potential to support climate resilience and disaster risk mitigation strategies at all stages, including preparedness, resilience building, emergency response, and recovery, as detailed in Table II (Islamic Financial Instruments Aligned with DRR Strategies). To realise this potential, it is crucial to establish an enabling institutional and regulatory environment that encourages the systematic integration of these instruments into national and regional DRR and climate resilience plans within OIC Member Countries.

4.1.2 Policy Recommendations for Advanced Economies

For high-income OIC countries equipped with mature financial markets and robust institutional capacity, efforts should concentrate on enhancing market sophistication and establishing global leadership. This involves creating and deploying innovative financial instruments specifically meant for disaster risk reduction and climate resilience, thereby positioning these countries as leaders and influencers to encourage wider adoption within the Islamic finance sector.

Strategic Objective: Leverage mature capital markets, institutional depth, and advanced regulatory frameworks to accelerate Islamic green finance innovation and cross-border leadership.

Action	Responsible Stakeholders	Timeline
Integrate climate stress testing into prudential supervision and regulation for both Islamic and conventional financial institutions, embedding climate risks and DRR into policy frameworks, aligned with the international standards and global best practices (particularly for macroprudential policies)	Central Banks and Financial Supervisory Authorities, IMF, and World Bank	Short-Medium Term (1-3 years)
Diversify Islamic green instruments beyond plain-vanilla green sukuk, introducing blue sukuk, sustainability-linked sukuk, transition sukuk, and hybrid structures while broadening the investor base globally, particularly targeting ethical and responsible investment funds.	Ministries of Finance, Capital Market Authorities, Islamic financial institutions	Medium Term (3-5 years)
Lead harmonization of green taxonomies, disclosure frameworks, and certification standards across the OIC, aligning with global norms and mitigating green washing while reflecting Islamic finance principles and increasing market integrity. This could set benchmarks for emerging markets.	OIC Secretariat, IsDB, National Regulators	Medium Term (3-5 years)
Develop a green finance framework to unlock the potential of financing mobilization from Islamic social finance market (such as zakat and waqf).	OIC Secretariat, IsDB, National Regulators	Medium Term (3-5 years)
Integrate digital innovation in green finance ecosystems, including Islamic green finance development and AI-driven climate risk analytics,	FinTech Companies, Capital Market Authorities, Central	Medium Term (3-5 years)

to improve efficiency, transparency, and investor outreach.	Banks, Islamic financial institutions	
Leverage sovereign wealth funds to co-finance large-scale renewable energy and climate-resilient infrastructure, crowding in private capital and directed to align with NDC target.	Sovereign Wealth Funds, Related Ministries	Medium-Long Term (3 – 5+ years)
Lead to build global market infrastructure, particularly in climate risk and DRR related standardized data, in collaboration with international organizations as well as increase or optimize participation in global climate and DRR initiatives to provide more balanced and comprehensive views of Islamic countries circumstances.	IsDB, IFSB and National Regulators, other global climate data repositories (EMDAT, IMF) and global climate forums (NGFS), UNDRR	Medium-Long Term (3 – 5+ years)
Promote public–private partnerships (PPP) to finance large-scale green infrastructure and clean energy projects, blending sovereign leadership with private sector innovation and capital.	Ministries of Finance, PPP Units, Private Sectors, MDBs	Medium-Long Term (3 – 5+ years)
Develop cross-border Islamic green investment platforms and marketplaces to improve <i>greenium</i> effect, market liquidity, reduce transaction costs, and enhance market visibility.	Regional Development Banks, IILM, IIFM, Stock Exchanges, Financial Centres, National Regulators	Long Term (5+ years)

4.1.3 Policy Recommendations for Middle and Low-Income Economies

For members with smaller or developing capital markets, key priorities are raising awareness, facilitating access, reinforcing institutions, and building capacity.

Strategic Goal: Raise awareness, build foundational skills, strengthen market infrastructure, and improve regulatory frameworks to attract sustainable investments and integrate Islamic finance into climate resilience and disaster risk reduction strategies.

Action	Responsible Stakeholders	Timeline
Introduce enabling regulations for green sukuk issuance, including tax incentives, reduced issuance costs, and simplified Shariah approval processes.	Ministries of Finance, Capital Market Authorities	Short Term (1-2 years)
Build institutional capacity through targeted training for regulators, issuers, and investors on	Central Banks, Financial	Short Term (1-2 years)

climate risk and DRR assessments, sustainable finance instruments, and Islamic finance innovation.	Supervisory Authorities, IMF, World Bank	
Enhance public and market awareness on climate risks and DRR as well as the value of Islamic green finance, and the potential <i>greenium</i> benefits through national campaigns, media outreach, and stakeholder dialogues.	Ministries of Finance and Environment, Financial Regulators, Industry Associations, Islamic financial institutions	Short-Medium Term (1-3 years)
Establish green project preparation facilities to create pipelines of bankable projects eligible for Islamic green finance, supported by MDBs and technical assistance providers.	Related Ministries, MDBs, IsDB	Short-Medium Term (1-3 years)
Implement blended finance frameworks combining concessional funds, guarantees, and private capital to de-risk climate investments and to finance DRR strategies.	MDBs, Islamic financial institutions, Development Agencies	Short-Medium Term (1-3 years)
Encourage digital innovation in green finance, such as mobile-based green investment platforms, blockchain-based project tracking, and AI tools for project monitoring and verification.	FinTech Startups, Capital Market Authorities	Short-Medium Term (1-3 years)
Mobilize Islamic social finance (zakat, waqf, qard hasan) for community-level adaptation projects, particularly in rural and climate and natural disasters vulnerable regions.	Religious Councils, NGOs, Regional Authorities, Social Finance Platforms	Medium Term (3-5 years)
Promote public-private partnerships (PPP) for renewable energy, water resilience, climate and natural disasters-resilient infrastructure projects to leverage both domestic and foreign capital.	Ministry of Planning, PPP Units, Ministry of Finance, MDBs, Private sector	Medium Term (3-5 years)

4.2. Roadmap for Islamic Financial Instruments Development in Combating Climate Risks and DRR

This roadmap outlines a phased approach and offers practical steps for aligning Islamic finance with climate objectives and DRR strategies. It reflects varying levels of market readiness while aiming for regional convergence.

Phase 1 FOUNDATION 1-3 years	Phase 2 EXPANSION 3 - 5 years	Phase 3 INTEGRATION 5+ years
• Mainstream climate risk considerations in policy settings • Develop or adapt green taxonomies • Launch public awareness campaign • Pilot sovereign and corporate green sukuk issuances • Establish central repositories for climate data • Introduce digital innovation pilots • Initiate small-scale PPP • Develop strategies for Islamic social financial supporting environment	• Expand the range of Islamic green financial instruments • Introduce macroprudential incentives • Develop green sukuk certification • Establish OIC green finance platforms • Implement climate disclosure requirements • Expand digital innovation • Scale up PPP frameworks • Scale up Islamic social financial instruments' implementation	• Fully integrate climate risk considerations • Position Islamic green finance as a mainstream investment class • Foster deep linkages between Islamic social finance and commercial green finance • Institutionalize policy review mechanisms within OIC • Foster partnership of OIC and global financial centres • Establish fully integrated digital ecosystem for Islamic green finance • Build long-term PPP pipelines • Fully integrate Islamic social finance into financial system
Establish the legal, regulatory, and market groundwork	Scale market participation, diversify instruments, and integrate climate risk	Fully embed climate risk and sustainability

Phase 1 – Foundation (Short Term, 1–3 years)

Objectives: Establish the legal, regulatory, and market groundwork to enable Islamic green finance growth.

Key actions:

- Mainstream climate risk into national financial sector strategies and Islamic finance roadmaps.
- Develop or adapt green taxonomies that reflect Islamic finance principles and Maqasid al-Shari'ah.
- Implement targeted awareness campaigns to improve market and public understanding of climate risks, DRR, and green finance opportunities.

- Pilot sovereign and corporate green sukuk issuances, supported by MDBs and guarantees, as well as technical assistance.
- Establish central repositories for climate-related and ESG investment data.
- Introduce digital innovation pilots, such as mobile-enabled green investment platforms, to improve market accessibility, transparency, and investor reach and engagement.
- Initiate small-scale public-private partnerships (PPP) in renewable energy and climate-resilient and DRR infrastructure to demonstrate feasibility and attract early-stage private capital.
- Formulate a strategy to establish a policy environment for using Islamic social financial tools for DRR and climate resilience.

Phase 2 – Expansion (Medium Term, 3–5 years)

Objectives: Scale market participation, diversify instruments, and integrate climate risk and DRR into supervisory frameworks.

Key actions:

- Broaden the scope of Islamic green financial products (e.g., sustainability-linked sukuk, blue sukuk, transition sukuk) and incorporate them into national capital market strategies.
- Introduce macroprudential incentives, such as reduced reserve requirements for green lending or increased loan-to-value ratios for green assets, to encourage greater participation by Islamic financial institutions in green finance.
- Develop a green sukuk certification system across the OIC and adhere to international disclosure standards to unify practices and lower costs for issuers.
- Establish regional OIC green finance platforms to promote cross-border investment and knowledge exchange.
- Implement climate and DRR-related disclosure requirements for all major Islamic financial institutions, starting with Islamic banks.
- Grow digital innovation by using AI-based climate risk and DRR assessment tools, blockchain for project verification, and online green finance marketplaces to boost efficiency and transparency.
- Scale up PPP frameworks to co-finance large-scale renewable energy projects, sustainable transport, and climate-resilient and DRR infrastructure, ensuring alignment with NDC targets and national development priorities.
- Expand the use of Islamic social financial instruments for DRR and climate resilience, guided by the strategic framework set out in Phase I.

Phase 3 – Integration (Long Term, 5+ years)

Objectives: Fully embed climate risk and sustainability into the DNA of Islamic financial systems, making Islamic green finance a mainstream asset class.

- Fully incorporate climate risk and DRR considerations into prudential regulation, risk management, and monetary policy operations.
- Position Islamic green finance as a key mainstream investment category within global ESG markets.

- Foster strong connections between Islamic social finance and commercial green finance to tackle both environmental and social aspects of climate action.
- Institutionalise ongoing policy review mechanisms within the OIC to monitor progress, share best practices, and adapt to changing climate, DRR, and market realities.
- Foster partnerships between OIC financial centres and prominent global green finance hubs to share expertise and access new markets.
- Establish fully integrated digital ecosystems for Islamic green finance, including interoperable platforms connecting investors, issuers, regulators, and verification bodies.
- Build long-term PPP pipelines for mega-projects in clean energy, sustainable cities, and climate adaptation infrastructure, leveraging both domestic and international private capital alongside sovereign and MDB funding.
- Fully integrate and institutionalise Islamic financial instruments into the financial system for DRR and climate resilience.

4.3. General Policy Recommendations for the OIC Countries

Policy Recommendation 1: Increase Public Awareness on the Growing Impact of Climate Risk to Foster Climate Action and Transition to a Low-Carbon and Climate Resilient Economy

Rationale and Expectation:

Raising public awareness is a fundamental step towards building collective recognition of climate risks and triggering a sustainable response. This responsibility extends beyond governments to all stakeholders, including the Islamic financial sector. Guided by the environmental ethos embedded in *Maqasid al-Shariah*, Islamic finance institutions are well-placed to align their objectives with climate goals. National and international regulators play a crucial role not only in creating rules and incentives but also in mainstreaming the urgency of climate action. Greater awareness can also enhance understanding of the “greenium” benefits for Islamic finance instruments, especially in justifying the additional costs for green and Shariah-compliant certification.

Policy Recommendation 2: Scale Up the Role of Multilateral Development Banks in Supporting Sustainable Finance in OIC Countries

Rationale and Expectation:

Addressing the climate finance gaps, especially in emerging OIC economies, requires greater support from Multilateral Development Banks (MDBs). These banks need to proactively promote transition finance by encouraging collaboration between wealthier and lower-capacity member states. This cooperation can help ensure fairer access to resources for climate mitigation and adaptation, supporting a just and equitable transition for all OIC countries.

Policy Recommendation 3: Integrate Climate and DRR Considerations into Global Islamic Financial Sector Policy Frameworks and Monitor Progress

Rationale and Expectation:

Although international bodies such as IFSB, CIBAFI, and AAOIFI have initiated efforts such as the Islamic Sustainable Finance Roadmap, their execution needs to accelerate. A comprehensive and balanced strategy is essential, not only to mobilise funds for sustainability but also to bolster risk management and financial stability frameworks. The Islamic finance sector's global initiatives should stay aligned with advancements in conventional finance. Harmonising regulations with conventional standards can minimise regulatory arbitrage and boost policy trustworthiness. Additionally, more focus is needed on expanding climate-related insurance markets to provide financial safeguards and resilience against climate-related disasters. Regulatory progress in Islamic finance should support, rather than replicate, conventional initiatives.

Policy Recommendation 4: Strengthen Domestic Inter-agency Collaboration among Governments, Central Banks, and Financial Regulators

Rationale and Expectation:

Concerted efforts by national policymakers are essential to create targeted, coherent policies that do not conflict and do not overburden climate initiatives. Collaboration can strengthen financial, monetary, fiscal, and macroprudential systems to support green projects and ensure financial resources align with climate goals. Policies should encompass both conventional and Islamic finance, supported by robust legal frameworks and robust institutional capacity. Developing a national sustainable finance strategy can guide these efforts by addressing supply and demand factors, such as product innovation, raising awareness, building infrastructure, and engaging stakeholders.

Policy Recommendation 5: Harmonise Green Taxonomy Frameworks with Consideration for Islamic Finance Specificities, Supported by Robust Market Infrastructure

Rationale and Expectation:

The proliferation of green taxonomies has raised concerns over market confusion and potential greenwashing. International harmonisation efforts, particularly through OIC forums, are vital to enhancing transparency, providing regulatory clarity, and standardising sustainable finance practices. Tailoring taxonomies to Islamic finance characteristics is essential. These efforts must be complemented by a robust market infrastructure that includes standardised certification processes and oversight mechanisms to ensure transparency and accountability.

Policy Recommendation 6: Unlocking the Potential of Islamic Finance, including Green Sukuk and Islamic Social Financial Instruments, and Promoting Shariah-compliant Innovative Financing and Public-Private Partnership Models

Rationale and Expectation:

Green sukuk are emerging as a promising tool for transition finance, attracting both Shariah-compliant and broader ESG investors. Although interest is increasing, issuance remains limited, especially in the corporate sector, mainly due to a lack of certifiable green projects. Governments

can set an example and share best practices to improve issuer capacity for participating in the global market. Exploring innovative contract structures- beyond ijarah, wakalah, and hybrid models- and new instruments such as blue sukuk can help address diverse national needs. Public-private partnerships, blended finance, and de-risking mechanisms can further boost investments in renewable energy, climate-resilient infrastructure, disaster risk reduction (DRR), and other green sectors. Additionally, effectively utilising Islamic social financial instruments for disaster risk reduction and climate resilience requires establishing an enabling policy and regulatory environment that promotes their systematic integration into national and regional frameworks.

Policy Recommendation 7: Ensure Adequate Standardised Data Availability and Develop Frameworks to Support Informed Policy Making

Rationale and Expectation:

Reliable and comprehensive data is essential for evaluating climate-related risks, including natural disasters, and developing effective policies. National regulators need to focus on data governance frameworks that facilitate systematic data collection and the creation of climate data repositories. These frameworks should adhere to international standards and include key aspects such as risk factors, institutional exposures, mitigation measures, and policy-relevant indicators, all of which are crucial for climate risk assessment, disaster risk reduction (DRR), and informed decision-making.

Policy Recommendation 8: Enhance Market Transparency through the Adopting a Global Disclosure Framework

Rationale and Expectation:

Following international sustainability reporting standards, like the ISSB climate disclosures, is crucial for increasing access to sustainable finance and enhancing market discipline. Adopting standards such as the ICMA Green Bond Principles at the national level can improve transparency in green sukuk allocation and impact evaluation, including carbon reduction and renewable energy initiatives. Transparent reporting builds investor trust, supports market analysis, and promotes continuous growth and diversification in the sustainable finance industry.

Policy Recommendation 9: Promote International Collaboration through the OIC Forum

Rationale and Expectation:

The OIC is essential in promoting coordination and shared learning among its members. Regular high-level discussions, backed by technical support from organisations like IsDB, IMF, and the World Bank, can evaluate DRR strategies and climate preparedness, pinpoint risks, and promote joint actions. Creating a dedicated task force could strengthen the Forum's ability to develop collective strategies and offer a unified regional voice for a fair and equitable climate transition, as well as for reducing the impacts of natural disasters.

Policy Recommendation 10: Leverage Islamic Social Finance and Digital Innovation to Support Climate Action and DRR

Rationale and Expectation:

Islamic social finance institutions and instruments, such as waqf and zakat, have significant untapped potential to support climate mitigation and resilience efforts. They can be tailored to address different stages of the climate cycle, such as post-disaster recovery, and promote development across various sectors, including social services, education, health, sanitation, economic activities, and sustainable infrastructure. Incorporating digitalisation and innovative approaches can boost their reach and impact, as long as these mechanisms are backed by strong governance and transparent operations.

4.4. An Islamic Moral Political Economy Paradigm Shift-based Policy Recommendation for the OIC Member Countries: Recalibrating the Relationship between Human, Society, Economy and Ecology

Islamic finance, developed within the framework of the Islamic moral economy, offers an alternative financial intermediation model grounded in Islamic values and principles derived from Islamic ontological logic. It emphasises broad stakeholder involvement by considering the interests of all parties – humans (labour), society, land, the environment, water/sea, and capital.

Islamic finance, however, has been compelled to operate within conventional or capitalist institutional logics, which reduce it to merely a fiqh-based financial intermediary through Shari'ah compliance by stripping Islamic finance of its moral conditions. The association of Islamic finance with conventional financial logics makes it vulnerable to producing similar outcomes, including environmental and climate risks.

In contrast, Islamic finance, located in Islamic moral political economy, offers a stewardship model aimed at embedding the interests of all stakeholders due to the tawhid's complementarity for unitarity condition, seeking to overcome such risks through an *islah* or reclamation process by adopting *ihsani* governance so that the initial equilibrium based on the *mizan* condition (balance between different stakeholders) can be achieved and sustained.

This report thus proposes a long-term, paradigm shift-based recommendation to recalibrate the relationship among individuals, the economy, society, and ecology within the framework of tawhid.

Such a process and outcome require an Islamic moral and political economy framework to guide public policy and the institutional logics of Islamic finance. This involves decoupling public policy and regulations, as well as governance related to Islamic finance, from the conventional finance-based institutional logics that shape the regulatory and governance environment OIC Member Countries.

According to the Islamic moral political economy paradigm, which serves as an aspirational reference for OIC Member Countries, these nations should consider a paradigm shift.

This shift involves moving away from traditional financial institutional logic by overcoming imposed regulations on Islamic finance, such as the Basel Criteria.

Doing so would enable Islamic finance to better serve all stakeholder interests by emphasising risk sharing and equity-based financing, thereby reducing debt-based financing.

It will reduce climate risk by controlling the creation of debt among individuals and, consequently, consumerism, which are major sources of observed climate risk, and it will also address DRR through adaptive policies.

This approach aims to maintain the *mizan* (balanced order) conditions to produce positive outcomes, including preventing climate risk and supporting DRR.

Through such a moral shift, the promise of the Islamic moral economy movement to safeguard and rescue human, environmental, and land resources, as well as capital, can become achievable. Hence, the possibility of controlling and moderating the climate risk and support for DRR can be possible.

CONCLUSION

The findings of this report underscore the significant and largely untapped potential of Islamic finance in addressing the growing challenges of climate change in OIC Member Countries. As the world faces an increasing frequency and severity of climate-related disasters, there is an urgent need for financing mechanisms that are not only effective and scalable but also rooted in inclusive and sustainable principles. Islamic finance, grounded in the core values of environmental stewardship (khalifa), social justice, risk-sharing, and prohibition of harm (darar), presents a compelling framework to align financial flows with climate-resilient development.

The comparative analysis of Azerbaijan, Indonesia, Nigeria, Qatar, and the United Kingdom reveals a wide spectrum of institutional readiness, policy engagement, and market maturity in leveraging Islamic finance for climate action. These countries offer important lessons for the broader OIC community.

Indonesia, for instance, stands out as a leader among OIC Member Countries in integrating Islamic finance into its climate agenda. The country's sovereign green sukuk model, regularly issued since 2018, offers a replicable blueprint for other nations. It has proven that Islamic finance can effectively attract international capital for climate-resilient infrastructure, renewable energy, and sustainable agriculture. Expanding this model to include municipal governments, state-owned enterprises, and the private sector can further democratize access to Islamic climate finance.

Nigeria's case highlights the intersection between climate vulnerability and financial exclusion. With large segments of its population affected by desertification, flooding, and unstable agricultural cycles, the role of Islamic microfinance becomes particularly vital. Institutions offering Shariah-compliant microfinance products can finance local adaptation projects and support resilience at the grassroots level. Integrating takaful for crops and health can further cushion vulnerable communities from climate shocks.

Qatar, with its sophisticated Islamic financial sector and strong sovereign wealth, is well-positioned to become a climate finance leader in the Gulf region. However, greater alignment between climate policy and Islamic finance is needed. Mandatory ESG disclosures for Islamic financial institutions, a national roadmap for green sukuk, and strategic partnerships with international green finance bodies can help channel domestic wealth into sustainable ventures.

Azerbaijan demonstrates the importance of institutional readiness and regulatory development. While it has begun exploring Islamic finance and recognises the urgency of transitioning to clean energy, the lack of a formal legal framework for Islamic financial instruments—particularly green sukuk—remains a significant constraint. For Azerbaijan and other emerging Islamic finance markets, legal harmonisation, Shariah governance frameworks, and technical expertise are essential to catalyse climate-linked Islamic finance.

The UK, non-OIC member, provides valuable lessons in regulatory innovation, ethical investment frameworks, and institutional integration of Islamic finance. Its experience demonstrates that Islamic finance can thrive in a non-Muslim context and support global sustainability goals. OIC countries can collaborate with UK-based institutions for training, capacity-building, and knowledge sharing in green finance.

To conclude, the integration of Islamic finance with climate action offers OIC countries an unprecedented opportunity to mobilize faith-based financial capital for environmental

sustainability. The ethical nature of Islamic finance not only resonates with Muslim-majority societies but also complements global efforts toward the UN SDGs. By adopting enabling policies, fostering innovation, and strengthening institutions, OIC Member Countries can transform Islamic finance into a cornerstone of their climate resilience strategies. This approach will not only contribute to environmental preservation but also promote financial inclusion, economic justice, and intergenerational equity.

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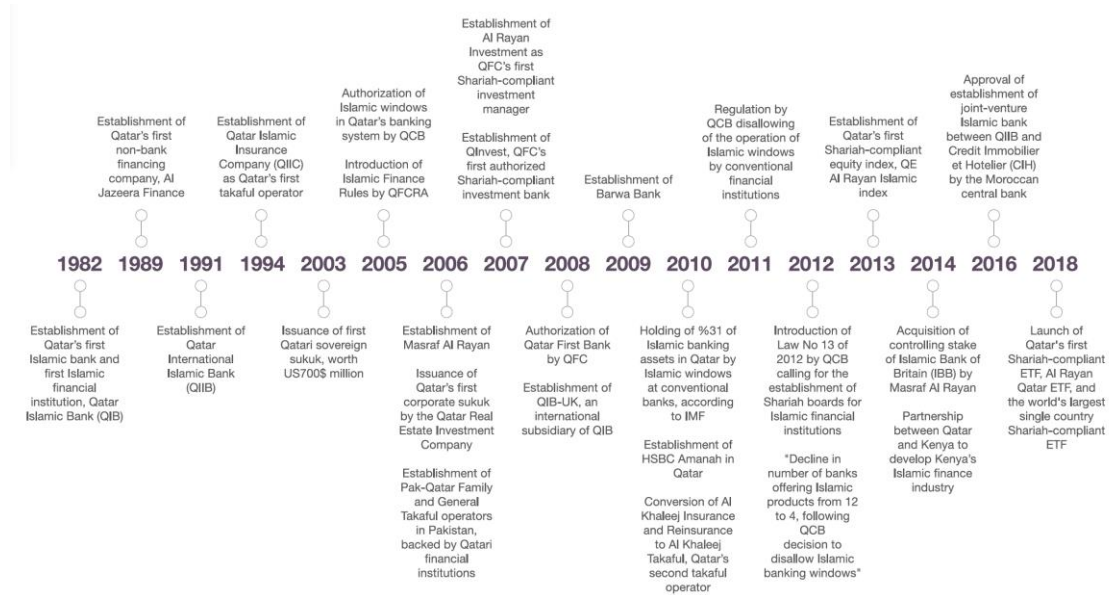
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APPENDICES

Appendix 1. Qatar Islamic Finance History



Source: Qatar Islamic Finance report 2018

Appendix 2. Islamic Finance Industry Development

Qatar's Islamic finance industry has evolved into one of the most dynamic sectors in the country's financial landscape. The industry's origins date back to 1982 with the establishment of Qatar Islamic Bank (QIB), the first Islamic financial institution in the country, which laid the foundation for Shariah-compliant banking and financial services. Over the decades, government support, regulatory reforms, and growing demand for Islamic products have driven the sector's expansion.

A significant milestone occurred in 2011 when the Qatar Central Bank (QCB) mandated that conventional banks cease operating Shariah-compliant windows, consolidating Islamic finance within fully-fledged Islamic banks and enhancing regulatory clarity. This move accelerated the development of dedicated Islamic finance institutions and reinforced Qatar's commitment to becoming a regional hub for Islamic finance.

In recent years, the industry has demonstrated resilience and robust growth, even amid global economic uncertainty. Islamic finance now plays a vital role in supporting financial inclusion, economic diversification, and shared prosperity in Qatar. Appendix 1 illustrates the historical evolution of the Islamic financial industry in Qatar.

Qatar's Islamic finance sector is considered as a regional and global leader, driven by strong banking and sukuk growth, regulatory support, and a strategic focus on innovation and diversification. Total Islamic finance assets in Qatar reached QAR 694 billion by end-2024, representing 27% of the country's overall financial system and placing Qatar among the world's top Islamic finance hubs. The sector's growth is supported by world-class infrastructure,

competitive tax policies, and progressive regulatory reforms. The Third Financial Sector Strategic Plan places strong emphasis on Islamic finance across banking, insurance, digital finance, and capital markets. Qatar's performance outpaced global averages, with the Islamic finance sector growing at a CAGR of 6.4% between 2020 and 2024, despite global headwinds.

Islamic Banking

Islamic banking remains the cornerstone of Qatar's Islamic finance industry, now accounting for the largest share of Islamic financial assets. By the end of 2024, Islamic banking assets reached QAR 586 billion, representing about 85%–87% of total Islamic finance assets in Qatar, and marking a compound annual growth rate (CAGR) of 6.8% since 2020. The sector continues to outperform conventional banking in asset growth with Qatar Islamic Bank (QIB) leading the sector. Deposits in Islamic banks grew to QAR 339.1 billion (up 8.2% year-on-year), with private sector deposits accounting for 57%. Financing by Islamic banks increased by 4.9% to QAR 401.5 billion, mainly directed toward real estate, government, and personal financing. Revenues rose by 12.6% to QAR 29.5 billion, with profits reaching QAR 8.7 billion (6% growth). The sector continues to benefit from progressive regulatory reforms and is a central pillar in Qatar's Third Financial Sector Strategic Plan, launched by the Qatar Central Bank in 2023.

Sukuk

Sukuk (Islamic bonds) account for 11.2% of total Islamic finance assets in Qatar. Outstanding sukuk issuances reached QAR 77.6 billion by the end of 2024 (up from QAR 57 billion in 2016). Sukuk issuances by Qatari entities more than tripled from QAR 9.2 billion in 2020 to QAR 30.4 billion in 2024, reflecting strong investor demand and government support. The market is still dominated by sovereign issuances, but there is a growing trend toward more corporate and quasi-sovereign sukuk, supporting market diversification.

Islamic Funds

Shariah-compliant investment funds in Qatar grew modestly, with assets under management rising to QAR 944.6 million by 2024 (up 1% year-on-year). Islamic funds represent a smaller share of the overall Islamic finance sector compared to banking and sukuk, but the segment is expanding, with a focus on product innovation and diversification. The performance of Islamic investment firms was mixed, with assets increasing by 5.2% to QAR 549.5 million and revenues surging 44.1% to QAR 59.7 million.

Takaful

Takaful (Islamic insurance) assets grew by 7.1% to QAR 5.1 billion in 2024, but still account for less than 1% of total Islamic finance assets. Policyholders' funds increased by 6.3% to QAR 2.6 billion, with insurance subscriptions rising 18.6% to over QAR 1.9 billion. The sector remains underdeveloped relative to conventional insurance, but is showing signs of growth, particularly in product offerings and consumer awareness.

Islamic Social Finance

Islamic social finance (zakah, waqf, and charitable endowments) continues to play an important role in financial inclusion and social welfare, though it remains a smaller segment compared to banking and capital markets. There is growing recognition of the need to integrate social finance more deeply into Qatar's development agenda, leveraging its potential for poverty alleviation and community development.

Table 2. Qatar Islamic Finance Sector (End-2024) and Key Trends

Segment	Assets / Issuances (QAR)	Share of Islamic Finance Assets	Key Trends
Islamic Banking	586 billion	85–87%	Outperforms conventional, robust deposit growth
Sukuk	77.6 billion (outstanding) / 30.4 billion (2024 issuances)	11.2%	Issuances tripled since 2020, mainly sovereign
Islamic Funds	944.6 million	<1%	Modest growth, focus on diversification
Takaful	5.1 billion	0.7%	Underdeveloped but growing
Social Finance	Not specified	Small	Increasing integration into development agenda

Source: Author's compilation

Appendix 3 Key milestones in Qatar's sustainable finance landscape

Qatar Central Bank (QCB)
The QCB has been at the forefront of sustainable finance reform, issuing the Sustainable Finance Framework in 2025 as a direct response to the Third Financial Sector Strategic Plan and the national ESG strategy. The framework sets out comprehensive guidelines for banks and financial institutions, emphasizing transparency, reporting, and external auditing. QCB has also supported the issuance of green bonds and facilitated cooperation with development banks to promote economic diversification through green finance. These initiatives are designed to balance economic growth with environmental and social responsibility, in line with global ESG trends.
Qatar Financial Centre Regulatory Authority (QFCRA)
The QFCRA has advanced sustainability reporting standards for financial institutions operating within the Qatar Financial Centre. In 2025, it introduced amendments requiring banks and other authorized firms to prepare and submit annual sustainability reports in accordance with international standards such as IFRS S1 and S2, including detailed disclosures on greenhouse gas emissions (Scope 1, 2, and 3). These requirements enhance transparency and accountability, ensuring that sustainability-related risks and opportunities are systematically identified and managed.
Ministry of Finance
The Ministry of Finance plays a coordinating role, ensuring that fiscal policy and public investment strategies are aligned with Qatar's sustainability objectives as articulated in the Third Financial Sector Strategic Plan and the Qatar National Vision 2030. The Ministry supports the integration of green finance considerations into national budgeting and public sector project evaluation, thereby reinforcing the enabling environment for sustainable finance across the economy.

Financial Industry

Qatar's financial industry has responded proactively to the evolving regulatory landscape. Banks have begun issuing green bonds and adopting sustainability-linked lending practices in line with QCB guidelines. Asset managers and insurers are developing new products to meet growing demand for ESG-compliant investments and risk management solutions. Industry engagement with the new frameworks is fostering innovation, improving risk management, and enhancing Qatar's reputation as a regional leader in sustainable finance.

Qatar's regulatory and institutional framework for green finance is considered among the most advanced in the region, with clear mandates for banks, capital market participants, and insurers to integrate sustainability into their operations. The coordinated efforts of the QCB, QFCRA, Ministry of Finance, and the financial industry have established a solid foundation for continued growth and innovation in sustainable finance. These developments position Qatar to attract green investment, support economic diversification, and contribute to global sustainability goals.

Appendix 4. Policy Recommendations and Responsible Stakeholders

Policy Area	Key Actions	Responsible Stakeholders
Integrate Climate in Islamic Finance Policy	Align Islamic finance with NAP/NECCS; mandate climate risk disclosure	Ministry of Finance, QCB, MECC, IFIs
Develop Green Islamic Products	Promote Green Sukuk, Takaful for climate risks, green funds/microfinance	QCB, QFCRA, Islamic banks, Takaful operators, QFC
Enhance Regulatory Frameworks	Preferential capital for green assets, mandatory climate risk assessment, national taxonomy	QCB, QFCRA, Ministry of Finance
Foster Partnerships & Collaboration	Create co-financing platforms, joint research and innovation hubs	MECC, Ministry of Finance, QCB, IFIs, private sector, academia
Fiscal & Prudential Incentives	Tax breaks, government guarantees, lower reserve requirements, micro-incentives for SMEs/households	Ministry of Finance, QCB, QFCRA
Build Capacity & Awareness	Professional training, public campaigns	QCB, QFCRA, QFC, industry associations, MECC
Monitor, Evaluate & Report	Impact tracking, transparent reporting by IFIs	QCB, QFCRA, MECC, IFIs

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