التمويل الأخضر ودوره في إعادة الإعمار ومكافحة التغير المناخي في سوريا: دراسة اقتصادية تحليلية مع دمج الوقف في آليات التمويل الأخضر

Green Finance and Its Role in Reconstruction and Combating Climate Change in Syria: An Economic Analysis with the Integration of Waqf in Green Financing

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الملخص:

تبحث هذه الدراسة في كيفية توظيف الوقف الأخضر لتعزيز النمو المستدام في سوريا، لا سيما في مرحلة إعادة الإعمار بعد الحرب، من خلال مناقشة سبل دمج مقاصد الشريعة الإسلامية المرتبطة بحماية البيئة مع الاحتياجات الاقتصادية والاجتماعية لعملية إعادة البناء. وتشير إلى إمكانية إنشاء مؤسسة وقف أخضر تتولى إدارة أصول الأوقاف واستثمارها في مشاريع مستدامة، مثل الطاقة المتجددة، وإعادة التشجير، وإدارة الموارد المائية، والزراعة العضوية، مع بيان دور هيئات الرقابة الشرعية في ضمان التزام هذه الاستثمارات بالمبادئ الشرعية. كما تكشف الدراسة عن التحديات السياسية والاقتصادية والاجتماعية التي قد تعيق تطبيق هذا النموذج، وتقترح حلولًا عملية تتمثل في سنّ تشريعات داعمة، وتعزيز الشفافية، وإطلاق مبادرات لإعادة بناء الثقة المجتمعية. وتخلص الدراسة إلى أن الوقف الأخضر يمكن أن يشكل أداة استراتيجية لإعادة إعمار البنية التحتية في سوريا بطريقة مستدامة بيئيًا واقتصاديًا، عبر دعم التنمية المحلية وتحقيق العدالة الاجتماعية.

الكلمات المفتاحية: الوقف الأخضر، التمويل الإسلامي، التنمية، إعادة الإعمار، الطاقة المتجددة، سوريا.

Abstract:

This paper explores the potential role of green waqf in fostering sustainable growth in Syria, particularly during the post-war reconstruction phase, by examining how the environmental objectives of Islamic Shariah can be integrated with the economic and social imperatives of national recovery. It proposes the establishment of a green waqf institution to manage endowed assets and channel investments into sustainable projects such as renewable energy, reforestation, water resource management, and organic agriculture, while highlighting the role of Shariah supervisory boards in ensuring compliance with Islamic principles. The study identifies the political, economic, and social challenges that may affect the implementation of this model and suggests practical solutions, including supportive legislation, enhanced transparency, and awareness initiatives aimed at rebuilding public trust. It concludes that green waqf can serve as a strategic instrument for reconstructing Syria's infrastructure in an environmentally and economically sustainable manner, while promoting local development and social equity.

Keywords: Green Waqf, Islamic Finance, Development, Reconstruction, Renewable Energy, Syria.

1. Introduction

Syria has been experiencing a multi-layered disaster during the last decade and a half which has entailed the devastation of infrastructure, socio-economic and social collapse, and hastened environmental imbalance caused by overs exploitation of the natural resources besides lack of proper systems that can manage the resources. It is against this background that reconstruction is no longer just a process of accessing damaged infrastructure but a process that is more multidimensional, existence of environmental and social consideration combined with economic priorities are to be incorporated in order to have a balance between the immediate demands and future sustainability (Alhasan et al., 2023). Green finance, begins to appear as the prospective factor that can assist the current stage and allow transferring investments into the projects of renewable energy, reforestation, regulation of water resources, and waste treatment all of which help provide sustainable development and restrain the effects of climate change. With the tendency of the global community focusing more and putting more emphasis on the practical implementation of green growth strategies as another economic concept, Syria can now redefine its choice of reconstruction strategies using a novel and extensive approach to take into consideration the changes in the environment and implement them through the use of financial tools (Alhasan et al., 2023). Nevertheless, to adopt such models, it will be essential to consider making appropriate adjustments to the contextual reality of Syria, which is determined by the extent of destruction, financial problems, and the inefficiency of institutions (Al-Attar, 2024).

One of the most persistent and significant modes of financing in the history of Islam is the Islamic waqf (endowment) that contributed to assisting economic and social progress of the time, it encompasses education and health care, infrastructure and social welfare. As the modern economic thought developed, the notion of green waqf has come to the scene as the new device that combines the aspiration of the Shariah term to promote justice and sustainability in the environment and resources together with the demands of a sustainable and economic and environmental progress (Alhasan et al., 2023).

The study proceeds with the following objectives; To analyze the concept of green finance, its economic objectives, and its role in supporting sustainable development. To examine the post-war reality of Syria, identifying the economic and environmental challenges hindering

reconstruction. To identify the opportunities to integrate green finance into reconstruction projects in key sectors such as energy, agriculture, and waste management. To highlight the role of Islamic waqf as an innovative financing mechanism for green projects in Syria.

2. Literature Review

A review of the literature reveals the scarcity of research addressing green finance in the context of Syria's reconstruction, as well as the absence of studies linking Islamic waqf mechanisms with green finance in conflict-affected environments (Al-Attar, 2024). Most of the available studies have focused either on the general aspects of green finance in achieving global sustainable development or on the role of Islamic waqf in supporting traditional sectors such as education, healthcare, and social services (Brown, Martinsson, & Thomann, 2022). However, integrating these two concepts to provide a comprehensive framework for sustainable reconstruction in Syria remains an underexplored area that requires in-depth investigation (Alhasan et al., 2023). This research seeks to fill this gap by presenting a scientific and practical vision that supports balanced development and fosters economic, social, and environmental stability.

Green Finance and Its Role in Financing Green Projects in Algeria – Reality and Hopes

This study aimed to highlight the importance of green finance as an innovative mechanism to support the transition toward a green economy in Algeria, with a particular focus on the role of modern financial instruments such as green bonds in financing environmentally friendly projects and sustainable development initiatives (Brown et al., 2022). The findings indicated that renewable energy represents a strategic alternative to fossil fuels due to its availability and environmental friendliness. However, the lack of applied research and limitations in practical implementation hinder the development of this sector. The study recommended fostering joint research initiatives to support environmental financial innovations, updating the banking system to integrate green financial products, raising awareness of green sukuk, and establishing green investment funds. The relevance of this study to the current research lies in its presentation of a regional model for the use of green finance tools in environmentally friendly projects, which can be adapted to the Syrian context.

Options for Financing Reconstruction in Syria

This thesis analyzed the reality of financing the reconstruction phase in Syria, focusing on diagnosing the internal economic and financial situation and identifying the challenges hindering the financing of reconstruction projects. It also reviewed international experiences, including those of Iraq, Lebanon, Kosovo, and Japan, to draw lessons from their approaches to financial resource management and post-crisis reconstruction (Brown et al., 2022). The results found that the Syrian financial system in its pure form is inadequate to serve the purposes of reconstruction and it is important that venturing into external sources of finances and restructuring domestic financing mechanism to suit phase requirements are sought (Daiyoub, Gelabert, Saura-Mas, & Vega-Garcia, 2023). The importance of this study is highlighted in the fact that it critically monitors the actuality and the reality of finance in Syria and findings presented in it can be used with reference to the use of both green finance and the wakf Islamic systems in the national rebuilding policies.

Economic Objectives of Green Finance

Green finance is one of the new instruments which encompass both economic and environmental aspects. It is not an exclusive financial tool of project funding but also a strategic tool of attaining sustainable development. It is important as it will lead it to environmental-friendly investments, which guarantee an excellent level of balance between economic growth on the one hand and the protection of the environment and climate resistance to risks on the other hand (Daiyoub et al., 2023). In this view international organizations and global economic entities have pinned down various objectives in the economy which green finance seeks to accomplish. Some of these goals include augmentation of the financial flows to environmental and developmental priorities (Daiyoub et al., 2023). The objective is one of the mainstays of the concept of green finance because it aims at mobilizing the common and private resources and channeling them towards projects and sectors that would bring about sustainable development in both economic, social, and the environmental front (Fauzi, 2021).

Reports by the United Nations Environment Programme (UNEP, 2017) explain that, upgrading financial flows into these priorities expresses the necessity to complement fiscal and economic policies with the international Sustainable Development Goals (SDGs) program (Fauzi, 2021). The encouragement of the investment in clean and sustainable energy is one of the most outstanding goals of green finance. In such a way, green banks

would aim to channel funds in this essential sector to make it more efficient and efficient, offering the cost of energy as low as possible and more reliable and help open the path to a low-carbon economy, thus narrowing harmful emissions and creating a long-term sustainable development.

This does not limit the role of green finance since besides funding of these projects, it also stimulates innovation in existing energy technologies that minimise waste and maximise efficiency like solar energy, wind energy and energy recycling projects (Hammoud, 2024). As observed by reports prepared by Organisation for Economic Co-operation and Development (OECD), green finance mechanisms to invest in clean energy have real economic benefits: long-term investments in green energy saves the cost of its operations, results in the employment of new jobs, and increases the competitiveness of the markets in the sustainable energy industry (Fauzi, 2021). The promotion of clean energy infrastructure can allow a country, particularly developing individuals, adapts to a new climate and reduce the level of environmental risks (Hammoud, 2024). This can be seen in the case of Malaysia and India where green financial policy and specialised banks have facilitated the creation of huge investment funds in solar energy that has added to the renewable energy production capacity and de-escalated dependency on fossil fuel. In its twelfth Malaysia plan (2021–2025), Malaysia set a target of attaining carbon neutrality by 2050 and the planned investment in the renewable energy industry was 1.2 to 1.3 trillion Malaysian ringgits (Hasan & Wigati, 2024).

Instruments of Green Finance

The effectiveness of a green finance system lies in the presence of viable and efficient financial instruments, which will help in its execution in practice. Despite the fact that the externality caused environmental challenges have to some extent been mitigated by the incentives accorded by the governments, regulatory frameworks, and the carbon pricing, these too fail to help attain the sustainable levels desired (Hammoud, 2024). To the other market failures, the market players need the innovative financial mechanisms that would help them deal with other market failures, manage the riskiness inherent in green projects, and deal with issues such as long repayment periods (Hasan & Wigati, 2024). This form of credit depends on the financial innovation in order to utilize the most advantage of emission rights and enhance the effectiveness of energy (Hasan & Wigati, 2024). It asserts the past method of lending (based on actual collateral) into loans

whose patterns are determined by anticipated returns of the green projects in the future. Green credit could include financing arrangements under Clean Development Mechanism (CDM), energy management contracts, financing of emission cutting technology, credit facilities in case a buyer is looking to purchase energy-conserving devices (Hammoud, 2024).

Green insurance is employed to open up to environmental risk management in terms of making the implicit costs understandable (Kamil, Bakhor, De Luna-Martinez, Zhang, & Aziz, 2019). Environmental liability insurance is the most prevalent form within China and entails the medical, legal and financial costs related to such factories. Such insurance makes high-risk investments less attractive, promotes active risk management, offers emergency reactions to disasters, and long-term risk management in the area of natural calamities and climatic change (Hasan & Wigati, 2024). The investor funds pump investments into small and medium sized firms (SMEs), which have initiated green projects but are yet to attain market listing. Cyclical Direct investment Once these companies mature, funds divest, and reinvest the capital in alternative new green projects, which undergo further routine investment increases at another cycle of sustainable investment (Kamil et al., 2019).

The Relationship Between Green Finance and Sustainable Development

(Kamil et al., 2019) examined the role of environmental policies in directing investments toward research and development in polluting sectors, highlighting that incentive-based tax policies can encourage innovation in clean production technologies. Their findings emphasize the importance of combining environmental taxes with research support to foster innovation in cleaner technologies, thereby reducing pollutants and achieving both environmental and economic sustainability. The study by Brown, Martenson, and Thoman explored the impact of environmental policies particularly emission-related taxes on stimulating technological change in industrial companies (Ari & Koc, 2021). Their results demonstrated that stricter environmental taxes on emissions drive companies to increase their investments in research and development (R&D) activities, especially in sectors where innovations are difficult to monopolize and where technological knowledge easily diffuses among economic actors (Ari & Koc, 2021). Moreover, the study clarified that the primary objective of increased R&D spending is not always to create entirely new technologies but to enhance firms' absorptive capacity their ability to leverage external

knowledge and integrate it into production and technological processes. This highlights that environmental tax policies not only reduce emissions but also generate internal incentives for innovation and the strengthening of technical capacities, supporting the transition toward an innovation-driven and sustainable green economy.

Affordable and Clean Energy (SDG 7) Green finance provides the financial resources and support for renewable energy initiatives, such as green banks and sustainable investment funds, thereby increasing access to clean energy and making it more affordable (Ari & Koc, 2021). Industry, Innovation, and Infrastructure (SDG 9) Green finance encourages investment in sustainable infrastructure and innovation, helping to stimulate economic growth while considering environmental dimensions, and strengthening national economic growth to deliver shared benefits across countries (Mahardika & Tanweer, 2025). Sustainable Cities and Communities (SDG 11) Green finance serves as an innovative financial mechanism to support sustainable urban development, promoting smart infrastructure projects and improving the resilience and quality of life in cities. Climate Action (SDG 13) Green finance funds climate initiatives and projects aimed at reducing greenhouse gas emissions and supporting environmental sustainability goals, aligning with adaptation and mitigation strategies for climate change (Ari & Koc, 2021).

It is evident from the above that green finance serves as a pivotal tool for achieving sustainable development, as it bridges economic growth with environmental preservation. Previous studies have consistently shown that enhancing innovation, supporting clean energy, and financing sustainable infrastructure are all areas where green finance makes a clear and significant contribution (Mahardika & Tanweer, 2025). Syria has witnessed widespread devastation across economic, social, and environmental sectors because of a 14-year-long war. The country's infrastructure has been severely damaged, and productive sectors have significantly declined (Al-Attar, 2024). Adding to these challenges, climate change has emerged as a factor that further complicates the reconstruction process, particularly in critical sectors such as agriculture, water, and energy (Mahardika & Tanweer, 2025).

Overview of the Impact of War on the Environment and Infrastructure in Syria

There has been a significant use of weapons in Syria that has led to massive contamination of the vast territories with explosives ranges such as landmines, improvised explosive devices (IEDs) and other explosive remnants of war. Military activities have also caused the spread of toxic substances and heavy metals in the soil. Studies have found that concentrations of nickel (133.30 ± 72.12 mg/kg) and chromium (122.14 ± 52.25 mg/kg) exceed the European guideline limits for agricultural soils in all samples analyzed from northwestern Syria (Al-Attar, 2024). Additionally, the collapse of the wastewater infrastructure since 2011 has led to the extensive and continuous discharge of untreated wastewater into groundwater sources, which are later used for irrigation (MAHLI, 2025). This has exacerbated the accumulation of potentially toxic elements in agricultural soils.

Degradation of Vegetative Cover and Forests: Syria has witnessed a significant decline in forest cover of approximately 19.3%, equivalent to 63,700 hectares, between 2010 and 2019, particularly in the northwestern region. Several factors have contributed to this degradation, including:

Illegal logging activities: Firewood has become a primary source of energy in Syria. Residents and internally displaced persons (IDPs) living near forests have resorted to cutting down trees for fuel and raw materials due to poverty, the high cost of energy, and the severe cold in northern Syria (MAHLI, 2025). Forest fires: Forest fires accounted for 23.4% of the total forest cover loss, often associated with bombardment and shelling during the conflict (Al-Attar, 2024). The displacement of more than 6 million people internally, particularly in Idlib and northern Aleppo, has placed enormous pressure on local ecosystems. Many IDPs living in camps have cut down trees for construction, heating, and cooking, driven by poverty and the rising costs of energy and building materials (MAHLI, 2025).

Decline of the Agricultural Sector: Syria's agricultural GDP has dropped by approximately 50% compared to 2010. Both crop and livestock production fell at similar rates of 49% and 51%, respectively. Wheat production, for example, declined dramatically from 3.08 million tons in 2010 to around 1.23 million tons in 2018, representing a 61% decrease (MAHLI, 2025). The number of sheep declined from 18 million heads in

2011 to an estimated 8 million heads in 2018. Other livestock and poultry sectors were similarly affected, resulting in a significant loss of this vital resource (MAHLI, 2025). The Food Security Index recorded a sharp decline of approximately 34% between 2010 and 2014. The "availability" dimension referring to households' access to food experienced the steepest drop, at 48%, due to blockades, forced displacement, movement restrictions, and declining purchasing power .(Zone, 2019)

In terms of industrial and environmental pollution, the collapse of the economy and infrastructure led to the proliferation of unregulated industries, such as informal oil refining, metal plating, and leather tanning, in addition to the use of low-quality agricultural fertilizers and the burning of lead fossil fuels (Zone, 2019). A significant increase in makeshift oil refineries has been documented, particularly in Deir ez-Zor, with tens of thousands of such facilities operating across at least 37 locations in northeastern Syria, causing widespread contamination of agricultural lands and local water sources (Zone, 2019).

Economic Challenges Facing the Reconstruction Phase

The commodities to overcome in Syria after the revolution reconstruction period are immense because the process of reconstruction will have to utilize huge amounts of money and it faces various-dimensional challenges (Mourad & Berndtsson, 2011). The subsequent part is based on the extensive survey of scholarly materials and diplomacy reports that allow pointing out the fundamental problems in the economy that threaten the successful and efficient outcome of the reconstruction process in Syria. According to the international estimates, the process of rebuilding Syria will demand tremendous financial resources. UN academic estimates industry (Mourad & Berndtsson, 2011). The rebuilding of the infrastructure suffers has cost so far; a study commissioned by the UN estimated that the reconstruction ought to cost more than 250 billion USD while other economic analysts propose the rebuilding cost should fall between 250-400 billion USD (Mourad & Berndtsson, 2011). This extreme price is due to the comprehensive ruining of roads and power grids, water systems, hospitals and schools in various provinces, such as Aleppo, Raqqa, Homs and Eastern Ghouta in Damascus, among others (Othman, Yusuff, & Hussain, 2025).

The Syrian economy has gone through a steep macroeconomic decline that causes extremely poor economic contraction. Since 2010, the economy

has reduced by about 83 per cent and has been estimated to have a value of just 21 billion USD at present. The exports reduced to 8.8 billion USD in 2010 down to 1 billion USD in 2023, and the imports dropped to 17.5 billion USD to just 3.2 billion USD and caused a huge trade deficit (Othman et al., 2025). This decline triggered rampant inflation, causing the Syrian pound to lose more than 99% of its value between 2011 and 2023, with hyperinflation driving a devaluation of around 141% against the US dollar. Among the key financial barriers are the international economic sanctions that significantly hinder the reconstruction process (Othman et al., 2025). US sanctions under the Caesar Act and other measures have obstructed reconstruction efforts. Even though some sanctions were reportedly eased, lifting designations under the Caesar Act requires Congressional approval, making the process slow and politically complex. This severely limits the flow of funds from organizations into Syria (Othman et al., 2025).

Additionally, there are significant banking access restrictions. Correspondent banks refuse to process transactions with Syria due to sanctions imposed on the Syrian Central Bank, making it nearly impossible to import US dollars or conduct other essential financial transactions (Mizanur Rahman & Nurul Islam Sohel, 2019). Oil production collapsed, dropping from 383,000 barrels per day in 2010 to only 90,000 barrels per day in 2023. The electricity infrastructure also requires massive investments for rehabilitation (Mizanur Rahman & Nurul Islam Sohel, 2019). As part of addressing this crisis, the World Bank approved a $146 million loan to repair the electricity grid. Agriculture suffered from widespread destruction of irrigation systems and the displacement of rural populations. Additionally, industrial areas around Damascus, Aleppo, and Homs were devastated, leading to a flight of capital and a sharp decline in productive activities (Mizanur Rahman & Nurul Islam Sohel, 2019). Widespread poverty and food insecurity persist, with 90% of Syrians living below the poverty line and 25% in extreme poverty. More than half of the population suffers from food insecurity (Syahputra, Kamal, & Ilyas, 2024).

Institutional and Governance Challenges:

The weakness and collapse of state institutions over many years of authoritarian rule have severely eroded public sector capacity. One stark example of this deterioration is the collapse of public sector wages, with doctors earning as little as $30 per month under the former regime. This institutional failure and dysfunction have led to high levels of risk in the

investment and the environment of Syria has become complex and high-risk in private sector participation. It is evident that economic challenges that do not allow Sybians to reconstruct the country are not divided into the financial and institutional parts but also the political and geographical one. When the government does not have full control over all the territories of Syria, this is one of the greatest hindrances to any majestic organization in the process of reconstruction (Syahputra et al., 2024).

Opportunities for Integrating Green Finance into Reconstruction Projects in Syria

Incorporating green finance in the rebuilding of Syria is a valuable chance to develop another sustainable and robust economy that will be able to address challenges associated with climate change. In addition to rebuilding physical infrastructures, this working strategy gives Syria an opportunity to shift to development, which would be economically exciting and environmentally friendly (Rajguru & Kautish, 2023). This is due to the fact that creative Islamic financial products such as waqf and green sukuk provides an opportunity to mobilize local, regional, and international sources and grant their adherence to moral and socially valuable values. By targeting these mechanisms in the reconstruction plan, Syria will be able to solve the immediate needs and at the same time develop a potential sustainable long-term basis of reconstruction planning (Rajguru & Kautish, 2023).

Such projects have the potential of developing the local economies through timber production and forest related industries as well as sequestration tourist enterprises which can bring tourists to their regions, bringing in more revenue to their economies (Syahputra et al., 2024). It can be financed through mobilizing the local population, the diaspora and the international donors through financing proposals like the green endowment where additional funds can be contributed by carbon markets that reward the sequestration efforts of greenhouse gases (Rajguru & Kautish, 2023). In the effort to boost reconstruction, Syria is able to draw on blended finance models. All these programs combine international grants, concessional lending by development banks and provision of contributions by the private sector and in this way, risks are mitigated and by implication broad based participation is facilitated. Green bonds of municipalities can also be a worthy tool, especially when used to finance large-scale waste management plants and the infrastructure required to serving these plants (Lee, 2017).

However, such strategy depends on availability of an enabling environment in order to be successful. A dynamic regulatory framework should be also implemented to be able to endorse new executive concentrations, and the anonymous nature of the natural resources is the key to the accumulation of public confidence (Lee, 2017). The state, private sector and civil society will also need to collaborate in not only ensuring the projects are inclusive, but also effective. Such institutional forms are essential so that even more innovative financing models would not attain the desired results (Wang, Zhao, Jiang, & Li, 2022). A fractured political landscape impacts greatly in Syria. Lack of unified firm government control on all the territories negates harmony in the implementation of policies. These divisions render it apparent that the success of green finance cannot be achieved without the support of reforms that would cover governance, stability, and fair economic management (Wang et al., 2022)`.

3. Methodology

3.1 Research Design

The current study will be through descriptive-analytical review and analysis of the current literature on the investigation of green finance alongside Islamic waqf. It also uses inductive approach to come up with general indicators on the international experiences and apply it to the strife in Syria. Moreover, a comparative method is used to analyze the similarities and differences between effective models throughout the world and local realities based on which, the possible framework of practical and unified actions adapted to the reconstruction requirements of Syria is formulated. The research paper adheres to the descriptive-analytical method, which is the most fitting in the research of newer effects of complexities like the convergence of the interests of green finance and Islamic waqf within the framework of the post-war reconstruction. The descriptions factor is applied to indicate the economic, environmental, and institutional reality on Syria in a systematic manner and shows the degree to which the infrastructure is ruined, productive sectors disintegrate and the threat with growing danger is due to climate impacts. The analytical section is followed by descriptive analysis to the critical analysis of the applicability of the global instruments of green finance and weight of waqf-based, measuring its complementary, limiting, and transformational nature. When adopting this design, the study acknowledges that quantitative data is limited due to conflict environment

and consequently employs interpretational, comparative and evaluative reasoning to derive practical inferences on a Syrian green waqf model.

3.2 Methodological Orientation

The central element of the descriptive strand lies in covering both the facts of economic breakdown in Syria and the destruction of the environment, along with the development of technologies of green finance and the usage of waqf on a global scale. It is analytical strand that allows the critical evaluation of the correspondence or lack of the correspondence of these world practices to Syrian realities, thus revealing opportunities and threats. The inductive thread is utilized to generalize best practices and conceptual pointer amongst successful international case studies as in the case of Indonesia waqf forests or Malaysian green sukuk projects, and transfer such lessons into the Syrian context. These orientations together make the study proceed more toward what you can do than what exists to come up with an evidence-based and a context-driven study.

3.3 Data Collection

Because of the current war and the situation of instability in Syria, the research is based on secondary and not primary data. Peer-reviewed academic literature on the topics of green finance, Islamic finance, and reconstruction economics are considered the main sources of the theoretical background and scholarly confirmation. The international organizations include World Bank, OECD, UNEP and the Islamic Development Bank, and policy reports and publications of its activities are also consulted to clients to capture global mainstreams and operating system. Such case studies as the country-specific ones, especially those of Indonesia, Malaysia and Kuwait, offer some practical model of green waqf that one can emulate. Grey literature, expert and NGO reports on the reconstruction of Syria and the environmental issues can also be used as sources of information that provides context-specific information that is absent in researched publications. All these sources make the results of the research more credible and certain that they are cross-validated with multiple points of view.

3.4 Data Analysis

The use of the comparative approach that allows drawing significant derives between international practice and local realities is one of the key points of methodology used in this research. It is a comparative study on different dimensions. First, there is a discursiveness from the one side to the

other: on the one hand, this is the divergence between proper international green waqf plans and, on the one hand, the crisis of institutional context in Syria, where the question of power and implementation within the community is debated. It compares the traditional green finance instruments like bonds and credit instruments with Islamic waqf mechanisms to bring out a wave of complementarities in terms of their ethical, social and environmental goals. Third, it compares the comparative practicability of the top-down approach to state-based initiatives to the bottom-up communal-based funding models in the disintegrated Mandatory framework in Syria. The comparative means of strategy does not expect a simplistic implementation of models but rather it and even tries out their versatility in the form of contextual critique. The research deploys a qualitative method to process and generalize the data that will be reviewed. Literature and reports are coded systematically through content analysis and the divisions of patterns and themes pertaining to green finance and waqf were identified. A comparative thematic synthesis is then used to combine the results of the study involving case studies and transferable lessons can then be elicited.

3.5 Ethical Consideration

Although this study does not entail human subjects, it also requires interaction with the sensitive contexts and, therefore, a clear ethical framework. Accuracy, cultural sensitivity and normative neutrality are the focal point of ethical considerations. The truthfulness is ensured through a cross-checking of information in order not to misrepresent the realities in Syria. The cultural sensitivity is noted by retaining the main influence of the Islamic practices on the development of the community perception regarding waqf and finance. The presentation of the recommendations as context-sensitive frameworks instead of universal solution can provide normative neutrality, and they are flexible and inclusive.

4. Findings

4.1 Berbagi Listrik Energy Projects

The Berbagi Listrik (Sharing Electricity) initiative, launched by the Nusantara Energy Waqf Foundation, serves as a successful example of providing electricity to remote areas through Islamic social financing, particularly waqf (Wang et al., 2022). These projects integrate waqf mechanisms with community development, creating economic, social, and environmental benefits. They also align with Sustainable Development Goal

7 (Affordable and Clean Energy) by deploying solar panel installations that deliver clean, reliable, and affordable energy to underserved communities (Wang et al., 2022). The Kuwait Public Waqf Foundation established an environmental fund in 1995 with the aim of protecting and preserving the environment. Moreover, the foundation had established a special environmental services firm that treated the wastewater at its point of origin in mosques to be reused in irrigation of vegetation and greening mosque courtyards, and the example is how waqf can be effectively applied in environmentally friendly services (Yadav, Pathania, & Kaushik, 2024).

4.2 Proposed Green Waqf Projects in Syria

The proposed green waqf plans are intended to draw on waqf resources to improve the development of the society and environment in Syria, especially at the post-conflict reconstruction stage (Yadav et al., 2024). The innovative type of solar power plants under Waqf is the possible way of reconstruction of the electricity sector in Syria. The lands owned by Waqf and the lands that have been acquired using waqf funds may be used to create solar power plants (Karagiannis, 2015). The plants are capable of producing energy that can be sold to the general grids or communities in the area and the earnings channeled to other societal and environmental projects. The Indonesian case has already demonstrated the usefulness of the methodology, and the Nusantara Waqf Energy Foundation has initialized the project to roll out the Nusantara generating the Berbagi Listrik program and supply electricity to poor district through Waqf PLTS (Solar Power Stations). Likewise, the Istiqlal Mosque in Jakarta embraced a waqf system in which it can fund the solar panels and fund its activities through solar energy (Karagiannis, 2015). The specified model can be modified to meet the increasing needs in the energy sector in Syria mostly rural regions as well as war-torn regions to support sustainable development and improve social and economic stability (Mourad & Berndtsson, 2011).

4.3 Reforestation and Waqf Forest Projects

Environmental statistics show that between 2010 and 2019, Syria lost a large chunk of its forest cover; its total loss of forest cover amounted to 19.3 or 63.7 hectares (MAHLI, 2025). The maximum loss took place in 2010-2015 at rate of 11.5 at certain regions of the country especially the North West part. Against this environment problem, considering the positive experience of the Waqf Forest in the context of Indonesia, these measures

can be applied in the context of the Syrian market. This method would presuppose buying's degraded or war-torn lands, which are subjected to waqf funds, and rehabilitating them through planting of drought resistance trees and fructose. Another aim of the model is the resources of creating nature reserves in order to preserve biodiversity and increase ecological balance (Othman et al., 2025). Besides, it also preconditions the development of the ecotourism process to ensure another income for the local population and raise environmental awareness, and active community engagement on the protection of resources and land restoration. As a guarantee of operational sustainability process, these facilities may have access to low-cost technologies that run on solar energy. Re-treated water may be reutilized to water green areas, productive trees in waqf made gardens, or nonprofit agricultural initiatives, as part of reconstruction efforts, but weighing ecological, social and economic aspects in a holistic perspective of green finance in Syria. As they seek to improve water security and build adequate sustainable reconstructions, rainwater harvesting programs, especially in Syria in rural regions have potentials (Ari & Koc, 2021).

4.4 Sustainable Agriculture Projects

The vision of model waqf farms is to adopt a new approach towards farming, using organic methods to grow nutritious and quality crops to be relied upon by the local community (Brown et al., 2022). The other interests of these farms are to train farmers on the best sustainable agriculture methods to boost their productivity, eliminate dependence on the traditional farming methods, and improve the food security of specific localities (Daiyoub et al., 2023). Waqf-based beekeeping ventures are a new paradigm model, which entails a blend of a monetary and environmental consequence. The goals of such efforts are to create waqf-financed apiaries to make high-quality natural honey, concurrently aid in the pollination of plants and raised agricultural output in rural communities of Syria. Effective foreign experiences teach a lot. As an example, a beekeeping initiative in Kenya, run by Islamic Relief, was aimed at equipping people in the local societies to accommodate impacts of climatic changes through offering them training in contemporary bee keeping techniques, honey generation and market selling (Fauzi, 2021).

The same model was also applied to the Syrian refugees whereby the organization gave them bee colonies and equipment and trained them to produce honey in a sustainable production in order to increase their income

level and to fulfill their basic needs in a sustainable and eco-friendly way (Hammoud, 2024).

Waqf is denoted by discernment in the long perspective of its adaptability and its dependence on provision of multiple projects that are responsive to the requirements of the society of the Syrian community in the reconstruction phase (Hasan & Wigati, 2024). Presenting a synthesis and fusion of these two mechanisms brings about the innovative type of financing, which finances renewable energy and reforestation projects, as well as sustainable agriculture and waste management, which in turn builds more resilience of the Syrian economy during the crisis (Kamil et al., 2019). The application of green waqf in Syria is limited by legal, regulatory, financial and social barriers, namely, no explicit legislation, institutional deficiency, and insufficient qualification of professionals, and limited community knowledge (Ari & Koc, 2021).

4.5 Investment Mechanisms

This strategy relates to the direct capital and investment in the environmental projects that are sustainable and the complete management and functioning of these projects is highly supervised by the waqf institution (Brown et al., 2022). This model serves the aim of having the same frequency of that the financial returns are produced and are then used to sponsor other forms of societal and developmental projects thus the economic and social sustainability of such investments in the long run (Daiyoub et al., 2023). It consists in the involvement in green funds that are dedicated to the sustainable projects and investing in stocks of the partners that are involved in environmental technologies. Tight diversification of the investment portfolio is also emphasized in an effort to ensure financial stability and balanced returns that can facilitate sustainability of the waqf-funded projects. Green waqf is used as a planning instrument on attaining a combined growth, engagements of environmental, economic, and social components. It model can help restore infrastructure and improve quality of life in Syria, by investing waqf funds to long-term sustainable projects, as well as producing long-term positive effects both on the environment, economy and society at large (Fauzi, 2021).

5. Discussion

The introduction of green waqf in Syria is not helped by the lack of a clear legal framework existing to control this form of endowment, which makes establishing and scaling it difficult. Also, the fragility of the oversight and accountability structures in waqf institutions makes the pursuance of transparency and efficiency in running such projects difficult. In addition, these administrative and registration hurdles to establish and administer waqf properties contribute to these regulatory totals (Hammoud, 2024). One of the biggest challenges facing the expansion of green waqf is lack of funding to initiate massive projects. This has been augmented by poor infrastructural technical and technological infrastructure in Syria that curtails the ability to undertake modern environmental projects (Hasan & Wigati, 2024).

Green waqf has a disadvantage in that not many people are aware of its significance and the possible benefits, thus, there is little participation and assistance. Fraudulent hesitation occurs also due to traditional groupings that experience doubtfulness to new strategies of managing the waqf. Moreover,(Kamil et al., 2019) being suspicious about new institutions constitutes a hindrance in accepting and using this model in the developmental and environmental projects. In order to address the loopholes, it is advised that special legislation governing green waqf should be put in place that not only spells the framework and regulations of the same, but also the duty of the concerned authorities. Digital technologies are also supposed to be used in the development of modern oversight systems that can provide accuracy and transparency related to controlling the waqf assets. Moreover, streamlining the instructions to register and manage green waqf properties would attract people and organizations to use this model and develop it further (Ari & Koc, 2021). There is also need to exploit global sources of funds and grants offered by institutions which facilitates programs related to the environment and development (Brown et al., 2022). The establishment of strategic collaborations with universities and research centers will contribute to the creation of the localized technologies that would be better suited to the conditions and needs of the Syrian market.

Socially and culturally, the social experiences as well as the cultural experience front of both examples of Indonesia indicate that the climate awareness is a major setback towards channeling the waqf funds towards the environmental and climate-related objectives (Daiyoub et al., 2023). A study by the Yale Program on Climate Change Communication revealed that 71%

of respondents in Indonesia knew little or nothing about climate change, only 16% believed that climate change was mainly caused by human activities, while 45% expressed the need for more information on the issue (Fauzi, 2021).

Waqf donations are one of the primary sources of funding for green waqf projects. Regular fundraising activities may be initiated both within Syria and abroad, with special attention to contacting its Syrians in the diaspora (Hammoud, 2024). Contemporary digital mediums can be tapped to make the process of donating easier and to bring a sense of transparency in how such funds are spent, and directed on specific environmental and developmental initiatives. Waqf green sukuk are innovative financing instruments to fund the projects of large scale in regard to the green waqf. Such sukuk are sold with the adherence to the Islamic Sharia laws, and they are oriented to sustainable investments (Hasan & Wigati, 2024). Focusing on investors of Islamic finance and environment responsible investments, they ensure that the methods of international green finance are adhered to in order to advance the transparency and enable more investments of different investors worldwide (Kamil et al., 2019).

The establishment of renewable energy projects and restoration of urban biodiversity by the recovery of depleting ecosystems could reduce the emission of carbon into the air and persuade the populace against engaging in potential water, air, and water polluters to ensure a clean environment in Syria. Green waqf can be used to protect the environment. It is also conducive to fighting desertification and soil erosion by means of initiating reforestation and vegetation restoration projects (Ari & Koc, 2021). Green waqf may basis new working places motivated by green spheres that contribute to the development of the local economy, decrease the use of imported fossil fuels and distribute with the development of the local industries aimed at technologies which help to fulfil ecological needs (Brown et al., 2022). Such innovations would empower countries in regard to production and create more opportunities to bring in foreign capital in the green industry to fund the sustainable development agenda (Daiyoub et al., 2023). Green waqf is also used to boost social development by ameliorating the quality of living in the local communities by providing basic necessities like affordable power access and clean water. It also facilitates the ecological sensibility of the Syrian citizens, corresponding to the culture of community regarding power of sustainability and attention of natural resources.

6. Conclusion

This study represents a scientific attempt to highlight the importance of integrating green finance with waqf as an innovative mechanism to support the reconstruction process in Syria, particularly in light of the complex challenges posed by more than fourteen years of war and the accelerating impacts of climate change. The findings indicate that any reconstruction plan that fails to consider the environmental and social dimensions alongside the economic aspects will remain incomplete and ineffective in achieving comprehensive and sustainable development. The research addressed the theoretical framework of green finance, its concepts, and economic objectives, demonstrating its ability to channel investments toward eco-friendly projects such as renewable energy, waste management, reforestation, and improved water resource management. It also examined the post-war reality of Syria, shedding light on the extent of destruction in infrastructure, the collapse of productive sectors, and the subsequent crises in food security and natural resources, in addition to the economic, financial, and institutional challenges that hinder reconstruction efforts. Through analyzing international experiences, such as Malaysian, Indonesian, and Kuwaiti models of integrating green finance and waqf in developmental projects, the study revealed that green waqf provides a real opportunity to mobilize financial resources both locally and internationally, ensuring their sustainability and alignment with clear Sharia-compliant and ethical standards. The research proposed a comprehensive practical model for a Syrian green waqf, based on a clear organizational structure and leveraging a variety of investment tools, including direct cash waqf, hybrid waqf models, green sukuk, and waqf-owned financial intermediaries (WOFI), which have proven effective in similar contexts.

6.1 Recommendation:

Integrating green finance with Islamic waqf is not merely a theoretical option but a practical necessity to ensure comprehensive and sustainable reconstruction in Syria. The study recommends establishing strategic partnerships between the government, private sector, civil society, and waqf institutions, alongside collaboration with international financial organizations, to ensure that resources are allocated efficiently and transparently, maximizing their economic, social, and environmental impact.

6.2 Limitations:

Although including waqf and green finance into Syria's rebuilding offers promise, one must be mindful of a number of constraints. The most difficult aspect is the split political scene, whereby split control and security instability weaken the consistent adoption of financial models. Implementing hybrid financial instruments or waqf-based mechanisms runs against great obstacles without institutional coherence and central government. Moreover, the lack of a defined legal framework for green waqf compromises regulatory control and could be erratic, thereby dissuading large-scale investment. Restricting domestic market absorption of creative finance is economic fragility. Local communities' capacity to contribute financially or engage with sustainable projects is constrained by broad poverty, high inflation, and crumbling infrastructure. Moreover, the paucity of technical skills in environmental management and green banking within Syrian institutions obstructs the conversion of conceptual models into reality. Still low public awareness of climate related problems and the part of waqf in environmental protection slows community participation as well. Finally, the great dependence on foreign investment and overseas gifts exposes vulnerability to outside political influences, sanctions, and donor fatigue, therefore questioning the long run continuity and independent operation of these funding systems.

6.3 Future Implications:

Integrating green finance and green waqf into Syria's rebuilding has significant consequences for resilience and sustainable development. The development of mixed financial models that combine international grants, green sukuk, and waqf-based funds has the potential to draw varied capital flows, lessen dependency. on traditional debt, and create trust in ethical funding methods. Future growth of green waqf can empower local communities by connecting contemporary sustainability objectives with cultural and religious practices. This alignment raises social ownership of rebuilding projects, particularly in areas like renewable energy, afforestation, and trash management where local involvement is crucial. Institutionally, effective adoption of these models would place Syria as a pioneering example of green Islamic financing in post conflict reconstruction, therefore offering a replicable blueprint for other weak nations. These projects could foster economic stability by stimulating new green businesses, generating jobs, and advancing energy security in the longer term. Accepting these

techniques ultimately guarantees that reconstruction is also about protecting future generations against environmental and economic vulnerabilities in addition to recovering from conflict.

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