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Green Financing for Sustainable Development in Saudi Arabia

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Abstract: In my paper, I explore the critical role of green financing in promoting sustainable development within Saudi Arabia. I begin by defining green financing and its significance in facilitating investments in projects that yield environmental benefits while driving economic growth. The paper highlights how green financing aligns with Saudi Arabia's Vision 2030 agenda, essential for the nation's economic diversification and ecological sustainability. I present a comprehensive analysis of the historical context and evolution of green financing, followed by an examination of its economic and environmental implications, including its capacity to create jobs and reduce carbon emissions. Case studies of successful initiatives, such as the Sakaka Solar Power Project and the Red Sea Project, illustrate the practical benefits of green financing in achieving sustainable development goals. Ultimately, I conclude that green financing is indispensable for Saudi Arabia's future, advocating for enhanced collaboration between the public and private sectors to foster a sustainable and economically viable future.

Keywords: green financing; sustainable development; Saudi Arabia; Vision 2030; renewable energy.

JEL Classification: G20; O44; Q42; Q58; O53; R11.

Introduction

In the rapidly changing landscape of global economies, the concept of green financing has emerged as a vital component in the quest for sustainable development. This paper examines the role of green financing in promoting sustainable development in Saudi Arabia, a country that is renowned for its vast oil reserves and traditional reliance on fossil fuels. However, as the world grapples with the pressing challenges of climate change and environmental degradation, Saudi Arabia finds itself at a crossroads. This paper seeks to explore how the infusion of green financing can catalyze a transformation towards a more sustainable economic model, one that not only prioritizes environmental benefits but also stimulates economic growth.

Green financing refers to the allocation of financial resources to projects that yield positive environmental impacts. This can encompass a broad range of initiatives, including investments in renewable energy, energy efficiency improvements, sustainable agriculture, and other eco-friendly ventures. The significance of this topic is profound, as it holds the potential to drive Saudi Arabia's economic diversification and environmental sustainability, which are critical objectives outlined in the Kingdom's Vision 2030 agenda. Vision 2030 is a comprehensive framework that seeks to reduce the country's dependence on oil, diversify its economy, and promote sustainable development across various sectors. By embracing green financing, Saudi Arabia can align its economic objectives with the urgent need for environmental stewardship, thereby fostering a more resilient and sustainable future for its citizens.

The thesis statement of this paper posits that green financing is essential for Saudi Arabia to achieve sustainable development. This study contributes significantly to the existing literature by providing a timely and comprehensive analysis of green financing's role specifically within Saudi Arabia's rapidly evolving sustainable development landscape. Its novelty lies in synthesizing the most recent policy frameworks, including the 2024 Green Financing Framework and subsequent initiatives, with empirical evidence from key projects like Sakaka Solar and the Red Sea Project, and assessing their combined economic and environmental implications. The

importance of this research stems from its focus on a major energy-exporting nation navigating a critical transition towards sustainability under the ambitious Vision 2030 agenda, offering crucial insights for policymakers, investors, and researchers engaged in green transitions within resource-dependent economies. This assertion is supported by its capacity to foster environmentally sustainable economic growth (Abro *et al.* 2023) and mitigate climate change through sustainable urban planning (Abubakar & Dano, 2020), both critical for the Kingdom's future. Firstly, green financing facilitates investments in renewable energy, which is crucial for reducing the Kingdom's carbon emissions and transitioning away from fossil fuels. As the effects of climate change become increasingly evident, the need for a sustainable energy transition is more urgent than ever. Secondly, green financing plays a pivotal role in promoting eco-friendly innovations, which can lead to the development of new technologies and practices that enhance resource efficiency and reduce environmental impact. By fostering a culture of innovation, Saudi Arabia can position itself as a leader in sustainable technologies and practices, thus enhancing its global competitiveness.

Moreover, the importance of green financing extends beyond environmental benefits; it also encompasses significant economic implications. The transition to a green economy can create new job opportunities, stimulate foreign direct investment, and foster technological advancements. As the world shifts towards sustainable practices, countries that prioritize green financing will be better positioned to attract investment and talent. This is particularly relevant for Saudi Arabia, which is seeking to diversify its economy and create a more vibrant job market for its growing population.

Additionally, the paper will explore the historical context of green financing in Saudi Arabia, tracing its evolution from fossil-fuel-based investments to sustainable practices, supported by institutional frameworks at Saudi universities (Abubakar *et al.* 2020) and efforts to overcome investment barriers to sustainability (Alshubiri, 2021). The shift towards green financing is not merely a response to external pressures; it is also a reflection of a changing mindset within the Kingdom. As awareness of environmental issues grows, so too does the recognition of the need for a diversified and sustainable economy. This historical perspective will provide valuable insights into the challenges and opportunities that lie ahead for Saudi Arabia in its pursuit of sustainable development.

The exploration of green financing in Saudi Arabia is of paramount importance in the context of sustainable development. This paper aims to provide a comprehensive analysis of the role of green financing in promoting environmental sustainability and economic diversification within the Kingdom. Through a detailed examination of historical trends, economic and environmental implications, and successful case studies, the paper will demonstrate the transformative potential of green financing in shaping a sustainable future for Saudi Arabia. Ultimately, this research seeks to contribute to a deeper understanding of how green financing can serve as a cornerstone for achieving the ambitious goals outlined in Vision 2030 and fostering a more sustainable and prosperous society for generations to come.

1. Methodology

This study employs a mixed-method approach to assess green financing's impact in Saudi Arabia:

1. Literature Review: A systematic review of peer-reviewed articles, government reports, and organizational data (*e.g.*, IRENA, SAMA) was conducted to establish the theoretical and empirical foundation. Sources were selected based on relevance to green financing, renewable energy, and Saudi Arabia's sustainability goals.

2. Case Study Analysis: Two projects—the Sakaka Solar Power Project and the Red Sea Project—were analyzed using primary data from the Saudi Ministry of Energy (n.d.), Red Sea Global (n.d.), and supporting documents (*e.g.*, ACWA Power reports). Metrics like capacity, emissions reductions, and socioeconomic benefits were extracted.

3. Data Synthesis: Quantitative data (*e.g.*, MW capacity, CO_2 reductions) were cross-verified with official announcements and secondary sources (*e.g.*, Saudi Press Agency), while qualitative insights on policy and innovation were drawn from Vision 2030 and SGI frameworks.

4. Limitations: The study relies on publicly available data, potentially underrepresenting internal financial or operational details.

2. Findings

2.1 Historical Context and Evolution of Green Financing

Green financing is a critical component in the global effort to achieve sustainable development. It encompasses the allocation of financial resources to projects and initiatives that provide environmental benefits, such as investments in renewable energy, energy efficiency, and other sustainable practices. In Saudi Arabia, the concept

of green financing has evolved significantly over the years, reflecting a broader shift in national priorities towards sustainability and economic diversification, particularly as articulated in the Vision 2030 agenda. This comprehensive framework envisions a future where the Saudi economy is not only resilient and diversified but also environmentally sustainable (AlArjani, Modibbo, Ali, & Sarkar, 2021).

Green financing refers to the funding of projects that yield environmental benefits, such as reduced carbon emissions, enhanced energy efficiency, and increased use of renewable energy sources. The main components of green financing include investments in renewable energy projects, energy-efficient technologies, and sustainable infrastructure development (Anser *et al.* 2020). These components not only aim to mitigate environmental impacts but also drive economic growth by fostering technological innovations and creating new job opportunities (Ronaldo & Suryanto, 2022). In Saudi Arabia, green financing is increasingly recognized as a vital tool for achieving the nation's sustainable development goals, as it supports the transition from a fossil-fuel-dependent economy to one that embraces sustainable practices.

Historically, Saudi Arabia's economy has depended heavily on fossil fuels, with oil and gas as its economic foundation, intensifying energy consumption (Mahalik *et al.* 2017) and exposing the Kingdom to stranded asset risks amid global shifts to greener economies (Ansari & Holz, 2020). However, this reliance posed significant challenges, including environmental degradation and vulnerability to global oil market fluctuations (Kahia *et al.* 2020). In response to these challenges, Saudi Arabia has embarked on a journey towards economic diversification and sustainability, with green financing playing a pivotal role in this transition.

The evolution of green financing in Saudi Arabia can be traced back to the early 2000s when the Kingdom began to explore alternative energy sources and sustainable practices. Initial efforts focused on research and development in renewable energy technologies, as well as pilot projects in solar and wind energy (Saleem, Khan, & Mahdavian, 2022). Over time, these efforts have expanded to include large-scale investments in renewable energy infrastructure, supported by both public and private sector initiatives.

One of the key milestones in the evolution of green financing in Saudi Arabia was the launch of Vision 2030 in 2016. This ambitious strategic framework aims to transform the Saudi economy by reducing its dependence on oil, diversifying its economic activities, and promoting environmental sustainability (Alshuwaikhat & Mohammed, 2017). Vision 2030 explicitly emphasizes the importance of green financing in achieving these goals, calling for increased investment in renewable energy, energy efficiency, and other sustainable projects.

Vision 2030 has been instrumental in driving the evolution of green financing in Saudi Arabia. The framework outlines specific targets for renewable energy capacity, energy efficiency improvements, and carbon emissions reductions, all of which require substantial financial investments (AlArjani *et al.* 2021). To meet these targets, the Saudi government has introduced a range of policies and initiatives designed to attract both domestic and international investment in green projects.

One of the key initiatives under Vision 2030 is the National Renewable Energy Program (NREP), which aims to increase the share of renewable energy in the Kingdom's energy mix. The NREP has set ambitious targets for the deployment of solar, wind, and other renewable energy sources, with green financing serving as a critical enabler of these projects (Islam & Ali, 2024). By providing financial incentives and support for renewable energy projects, the NREP has helped to catalyze the growth of the green finance sector in Saudi Arabia.

In addition to the NREP, Vision 2030 has also spurred the development of new financial instruments and mechanisms to support green projects. These include green bonds, green sukuk, and other forms of sustainable finance that facilitate investment in environmentally beneficial projects (Khalil *et al.* 2023). By expanding the range of financing options available for green initiatives, Vision 2030 has helped to create a more conducive environment for the growth of green financing in Saudi Arabia.

Despite the progress made in promoting green financing in Saudi Arabia, several challenges remain. One of the primary obstacles is the need to overcome the entrenched reliance on fossil fuels and traditional energy sources. This requires not only significant financial investments but also a cultural and institutional shift towards embracing sustainable practices (Sharif *et al.* 2022). Additionally, the development of green financing mechanisms and instruments is still in its early stages, necessitating further innovation and capacity-building efforts.

However, these challenges also present opportunities for growth and development. By leveraging its vast natural resources, such as solar and wind energy, Saudi Arabia has the potential to become a global leader in renewable energy production (Kahia *et al.* 2024). Green financing can play a crucial role in realizing this potential by attracting investment, fostering technological innovation, and creating new economic opportunities.

Furthermore, the growth of green financing in Saudi Arabia benefits from a supportive policy environment and firm government commitment to sustainability, reinforced by regional renewable energy policies (Malik *et al.*

2019) and the adoption of green sukuk inspired by models like Malaysia's (Liu & Lai, 2021). The Kingdom's strategic initiatives under Vision 2030 provide a clear roadmap for the development of the green finance sector, with specific targets and measures designed to promote investment in sustainable projects (Alshuwaikhat & Mohammed, 2017). In 2025, Saudi Arabia launched a green financing initiative worth SR1 billion (US$266.6 million) to boost private investment in sustainable ventures focusing on renewable energy, circular economy practices, and green technologies (Middle East Breifing 2025). This commitment is further reinforced by the increasing recognition of the economic and environmental benefits of green financing, both within Saudi Arabia and globally.

Green financing has the potential to significantly impact Saudi Arabia's economic diversification and sustainability efforts. By channeling financial resources towards renewable energy projects, energy efficiency improvements, and sustainable infrastructure development, green financing can help to reduce the Kingdom's dependence on oil and foster the growth of new economic sectors (Anser *et al.* 2020). This diversification is essential for ensuring long-term economic resilience and stability, particularly in the face of global energy market volatility.

Moreover, green financing contributes to environmental sustainability by supporting projects that reduce carbon emissions, enhance energy efficiency, and promote the use of renewable energy sources (Ronaldo & Suryanto, 2022). These efforts are critical for addressing the environmental challenges facing Saudi Arabia, such as air pollution, water scarcity, and climate change. By investing in sustainable projects, green financing can help to mitigate these challenges and create a more sustainable and livable environment for future generations.

In conclusion, the historical context and evolution of green financing in Saudi Arabia reflect a broader shift towards sustainability and economic diversification, driven by the Vision 2030 agenda. While challenges remain, the progress made in developing green financing mechanisms and promoting investment in sustainable projects is a testament to the Kingdom's commitment to achieving its sustainable development goals. As Saudi Arabia continues to evolve its green finance sector, it has the potential to become a global leader in sustainable development, setting an example for other nations to follow.

2.2. Economic and Environmental Implications

This section examines the economic and environmental impacts of green financing in Saudi Arabia, which is pivotal in transforming the nation's approach to development. Green financing, which refers to funding directed toward projects that have positive environmental impacts, plays a crucial role in the broader context of sustainable development. The Kingdom of Saudi Arabia, heavily reliant on its oil-based economy, is recognizing the need to diversify its economic base while simultaneously addressing environmental concerns. This dual focus is essential as the world shifts towards more sustainable practices and as climate change becomes an increasingly pressing issue.

A key economic implication of green financing is its capacity to generate jobs, supported by Vision 2030-aligned sustainable growth strategies (Sarwar, 2022) and amplified by international trade's role in sustainable development (Belloumi & Alshehry, 2020). The renewable energy sector, for instance, is labor-intensive and requires a variety of skills, from engineering and construction to project management and maintenance. According to the International Renewable Energy Agency (IRENA), the global renewable energy sector had created approximately 11 million jobs by 2018, with continued growth projected, and in Saudi Arabia, similar job growth is anticipated as the nation invests in renewable energy projects like solar and wind farms (International Renewable Energy Agency, 2019). The government's goal to generate 58.7 GW of renewable energy by 2030 is expected to create thousands of jobs across various sectors (Islam & Ali, 2024).

Moreover, green financing can attract foreign investments, which are crucial for economic growth. Investors are increasingly looking for sustainable investment opportunities as environmental, social, and governance (ESG) criteria become more important in investment decisions. The Saudi government has recognized this shift and is actively seeking to position the country as a leader in green investments. For instance, the launch of the Saudi Green Initiative signals the Kingdom's commitment to attracting both local and foreign investments in sustainable projects.

Data from the Saudi Arabian Monetary Authority (SAMA) indicates that the total value of green bonds issued by Saudi entities has been steadily rising, with Saudi Arabia issuing its first green bond in 2020, raising $1.5 billion to fund renewable energy projects (Saudi Arabian Monetary Authority, 2021). The renewable energy sector, particularly solar and wind energy, requires ongoing advancements in technology to increase efficiency and reduce costs. Companies involved in green financing often engage in research and development (R&D) to innovate new technologies that can be employed in sustainable projects. For instance, the King Abdulaziz City for

Science and Technology (KACST) is playing a pivotal role in developing solar energy technologies in Saudi Arabia. By investing in R&D, Saudi Arabia can not only improve its energy efficiency but also create a competitive edge in the global market.

From an environmental perspective, green financing is vital for reducing carbon emissions in Saudi Arabia, crucial for meeting international climate commitments, with renewable energy and financial innovation playing key roles (Ben Belgacem *et al.* 2023) alongside efforts to adopt low-carbon technologies and reform fossil fuel subsidies (Matsuo & Schmidt, 2017). he Kingdom has pledged to reduce its carbon emissions by 130 million tons annually by 2030 under the Paris Agreement (Kingdom of Saudi Arabia, 2021). Achieving this goal requires significant investments in renewable energy sources and other sustainable practices.

Green financing can facilitate the transition from fossil fuels to renewable energy. This shift is vital, given that Saudi Arabia has one of the highest per capita rates of carbon emissions in the world, largely due to its heavy reliance on oil. By investing in renewable energy projects, Saudi Arabia can significantly decrease its carbon footprint. For example, the Sakaka Solar Power Plant, which has a capacity of 300 MW, is expected to reduce carbon emissions by approximately 430,000 tons annually (Saudi Ministry of Energy, n.d.). This project exemplifies how green financing can lead to tangible environmental benefits while also aligning with the nation's economic goals.

In addition to promoting renewable energy, green financing also supports sustainable resource management. This is particularly important in a country like Saudi Arabia, where water scarcity is a pressing issue. Investments in technologies for efficient water management, such as desalination and wastewater treatment, can help conserve water resources. For instance, the National Water Company has implemented several projects funded through green financing to improve water treatment and distribution systems across the Kingdom. These projects not only ensure sustainable water management but also contribute to the overall environmental goals of the country.

Furthermore, green financing can promote biodiversity and ecosystem conservation. The Red Sea Project, which aims to create a luxury tourism destination while preserving the natural environment, is an example of how sustainable projects can be funded through green financing. By integrating environmental considerations into economic development, Saudi Arabia can promote a more sustainable approach that balances economic growth with ecological preservation.

Sustainable resource management is integral to economic and environmental sustainability, advanced by circular economy principles (Almulhim & Al-Saidi, 2023) and energy efficiency gains in buildings that cut consumption significantly (Al-Tamimi, 2017). Green financing can support various initiatives aimed at resource conservation and efficiency. For example, investments in energy efficiency improvements in buildings and industries can significantly reduce energy consumption and lower operating costs. According to the Saudi Energy Efficiency Program, improving energy efficiency in buildings could reduce energy consumption by up to 30% by 2030. This not only translates to cost savings but also contributes to lower carbon emissions, helping the Kingdom achieve its sustainability goals.

Moreover, green financing can facilitate the development of sustainable agricultural practices, which are essential in a country where agriculture is a vital sector. Investments in technologies such as precision agriculture, which utilizes data and technology to optimize farming practices, can lead to more efficient resource use and reduced environmental impact. Green financing initiatives that support sustainable farming can help increase food security while minimizing the ecological footprint of agricultural activities.

In conclusion, the economic and environmental implications of green financing in Saudi Arabia are profound and multifaceted. By investing in renewable energy projects, the Kingdom can create jobs, attract foreign investments, and foster technological innovations, all of which contribute to economic growth. Simultaneously, green financing plays a crucial role in reducing carbon emissions, promoting sustainable resource management, and supporting biodiversity.

As Saudi Arabia continues its journey toward a more sustainable future, green financing will be integral to achieving the dual goals of economic prosperity and environmental sustainability. The Kingdom's commitment to green financing not only aligns with its Vision 2030 agenda but also positions it as a leader in the global transition towards a more sustainable economy. As the world increasingly prioritizes sustainability, Saudi Arabia's proactive approach to green financing will be essential in ensuring its long-term economic resilience and environmental health.

To further enhance the impact of green financing in Saudi Arabia, it is vital for the government to foster collaboration between public and private sectors, encourage innovation, and support research initiatives. By

creating an enabling environment for green financing, the Kingdom can unlock the full potential of sustainable development, paving the way for a prosperous and environmentally responsible future.

3. Case Studies of Green Financing Initiatives

In recent years, Saudi Arabia has embarked on a transformative journey towards sustainable development, with green financing serving as a crucial catalyst in this endeavor. This section delves into specific case studies of successful green financing projects within the kingdom, highlighting their contributions to increasing renewable energy capacity, reducing carbon footprints, and benefitting local communities. The case studies selected for analysis are the Sakaka Solar Power Project and the Red Sea Project. These projects not only reflect the commitment of Saudi Arabia towards a greener future but also demonstrate the potential of green financing to achieve sustainable development goals in the region.

The Sakaka Solar Power Project stands out as a major renewable energy initiative in Saudi Arabia, reflecting Vision 2030's renewable energy prospects (Amran *et al.* 2020) and showcasing green entrepreneurship's role in sustainable development (Alwakid *et al.* 2021). Launched in 2019, this project is a key component of the National Renewable Energy Program, which aims to diversify the energy mix of the kingdom and reduce its dependence on fossil fuels. The project was developed by a consortium that included the Saudi public investment fund and international partners, showcasing the collaborative efforts between the government and private sector in promoting green financing.

The Sakaka Solar Power Project has a total capacity of 300 megawatts (MW), generating an estimated 500,000 megawatt-hours (MWh) of electricity annually, sufficient to power approximately 45,000 homes and significantly contributing to the energy needs of local communities (Saudi Ministry of Energy, n.d.).The project has been designed to utilize advanced photovoltaic technology, which increases efficiency and reduces the overall cost of electricity production. This is particularly relevant in the context of Saudi Arabia, where the cost of electricity generation from solar sources has plummeted in recent years, making it a more attractive option compared to traditional fossil fuels.

From an environmental perspective, the Sakaka Solar Power Project plays a vital role in reducing carbon emissions. According to estimates, the project is expected to displace around 400,000 tons of carbon dioxide (CO2) emissions annually. This reduction is crucial, especially considering the kingdom's commitment to the Paris Agreement and its efforts to combat climate change. By investing in solar energy, Saudi Arabia is taking meaningful steps towards achieving its greenhouse gas reduction targets and promoting a more sustainable energy future.

Furthermore, the Sakaka project has generated numerous job opportunities for local residents. During the construction phase, it was reported that more than 1,000 jobs were created, contributing to the local economy and providing training and skill development for the workforce. The project also includes provisions for local content, ensuring that a significant portion of the materials and services required for the project is sourced from local suppliers. This approach not only fosters economic growth but also empowers local communities by enhancing their capacity to participate in the renewable energy sector.

In terms of financing, the Sakaka Solar Power Project was made possible through a mix of equity and debt financing, with a significant portion of the funds coming from green bonds. These bonds are specifically designed to finance projects that have positive environmental impacts, and they have become increasingly popular among investors looking to support sustainable initiatives. The success of the Sakaka project serves as a model for future green financing endeavors in Saudi Arabia, demonstrating how financial instruments can be leveraged to support the transition to renewable energy.

Red Sea Project exemplifies another pioneering green financing initiative in Saudi Arabia, creating a luxury tourism destination with a focus on environmental sustainability, backed by policies promoting climate action and diversification (Al-Sarihi, 2019) and advanced by green sukuk's role in Vision 2030 (Shalhoob, 2023). The project is part of the country's broader Vision 2030 strategy, which seeks to diversify the economy and promote tourism as a key sector for growth. The Red Sea Project encompasses a vast area of pristine coastline, islands, and marine ecosystems, making it a prime location for eco-tourism.

One of the standout features of the Red Sea Project is its commitment to sustainability and conservation, with the project aiming to be powered entirely by renewable energy and targeting a 100% reliance on clean energy sources for its operations (Red Sea Global, n.d.).This ambitious goal is expected to be achieved through a combination of solar, wind, and other renewable energy technologies. By utilizing advanced energy management systems, the project will minimize energy consumption and maximize efficiency, setting a new standard for sustainable tourism developments worldwide.

The Red Sea Project has also integrated environmental conservation into its design and planning processes. A significant portion of the project area is designated as protected marine and terrestrial environments, ensuring that biodiversity is preserved and natural habitats are safeguarded. Moreover, the project incorporates sustainable practices in construction and operation, including waste management, water conservation, and sustainable sourcing of materials. This holistic approach to sustainability not only enhances the project's appeal to eco-conscious travelers but also reinforces Saudi Arabia's commitment to environmental stewardship.

Economically, the Red Sea Project is expected to create thousands of jobs and attract significant foreign investment. The development is projected to generate approximately 70,000 jobs, providing employment opportunities for local residents and contributing to the overall economic growth of the region (Red Sea Global, n.d.). The project aims to draw international tourists, which will further boost the local economy through spending on services, hospitality, and recreational activities. By fostering a sustainable tourism sector, the Red Sea Project aligns with the kingdom's vision of diversifying its economy away from oil dependency.

In terms of financing, the Red Sea Project has attracted substantial investments from both local and international sources. The project has issued green bonds to raise capital, signaling a strong commitment to environmental responsibility. These bonds have garnered interest from socially conscious investors seeking to support projects that promote sustainability. The financing model employed by the Red Sea Project exemplifies how green financing can be effectively utilized to fund large-scale developments with positive environmental impacts.

Both the Sakaka Solar Power Project and the Red Sea Project serve as prime examples of how green financing can drive sustainable development in Saudi Arabia. These case studies highlight the multifaceted benefits of investing in renewable energy and environmentally friendly initiatives. By enhancing renewable energy capacity, reducing carbon footprints, and supporting local communities, these projects contribute significantly to the kingdom's sustainability goals.

The success of these initiatives also underscores the importance of collaboration between the public and private sectors in advancing green financing. Government support, in the form of favorable policies and regulations, plays a crucial role in creating an enabling environment for green investments. Additionally, partnerships with private companies and financial institutions help to leverage resources and expertise, ensuring the successful implementation of sustainable projects.

Moreover, these case studies illustrate the potential for green financing to attract foreign investment and stimulate economic growth. As the global demand for sustainable solutions continues to rise, investors are increasingly looking to support projects that align with their environmental, social, and governance (ESG) criteria. By positioning itself as a leader in green financing, Saudi Arabia can capitalize on this trend and enhance its attractiveness as an investment destination.

In conclusion, the Sakaka Solar Power Project and the Red Sea Project exemplify the transformative potential of green financing in promoting sustainable development in Saudi Arabia. By enhancing renewable energy capacity, reducing carbon emissions, and supporting local communities, these initiatives contribute to the kingdom's broader sustainability agenda. As Saudi Arabia continues its journey towards a more sustainable future, the lessons learned from these case studies can inform future green financing efforts and guide the development of innovative financing mechanisms that support sustainable projects across the region. Through continued investment in green initiatives, Saudi Arabia can pave the way for a cleaner, more sustainable future while achieving its economic diversification goals outlined in Vision 2030.

Conclusion

In conclusion, this paper has articulated the essential role that green financing plays in the pursuit of sustainable development in Saudi Arabia. Throughout the discussion, we have explored various facets of green financing, demonstrating how it underpins not only economic growth but also environmental preservation. The core thesis has been clearly established: green financing is critical for Saudi Arabia's transition toward sustainable development, particularly in the context of the Vision 2030 agenda. This conclusion will encapsulate the key points raised in the paper, including the historical evolution of green financing, its economic and environmental implications, and the case studies that exemplify its success in the region.

The historical context of green financing in Saudi Arabia shows a marked shift in investment strategies over recent decades, propelled by rising environmental awareness (Khayat *et al.* 2023) and reflected in the Kingdom’s advancing green economy (Chaaben *et al.* 2024). Initially, the Saudi economy relied heavily on fossil fuels, with investments directed towards traditional energy sources. However, as global awareness of climate

change and environmental degradation increased, there was a palpable shift in focus toward renewable energy and sustainability. This evolution reflects not only a response to international pressure but also a recognition of the finite nature of fossil fuels and the necessity for a diversified economy. The Vision 2030 initiative has been a pivotal driver in this transition, promoting the idea that sustainability is not merely an environmental concern but a fundamental component of economic resilience and growth. As a result, green financing has emerged as a strategic tool to support this vision, facilitating investments in projects that yield both economic returns and environmental benefits.

Analysis of green financing's economic implications reveals its role in fostering job creation, attracting foreign investment, and driving technological innovation, bolstered by FinTech's impact on energy efficiency in the region (Al-Kasasbeh *et al.* 2024) and sustained by education and training (Singh *et al.* 2022). For instance, the renewable energy sector has the potential to create thousands of jobs across various skill levels, from skilled labor in solar panel installation to research and development roles in innovative technologies. According to the International Renewable Energy Agency (IRENA), the renewable energy sector employed approximately 11 million people globally in 2018, with significant growth anticipated as more countries, including Saudi Arabia, embrace green initiatives. In Saudi Arabia, the National Renewable Energy Program (NREP) aims to generate 9.5 GW of renewable energy by 2030, which is projected to create thousands of jobs and attract substantial foreign direct investment (FDI) into the country. This aligns perfectly with the goals outlined in Vision 2030, which seeks to diversify the economy and reduce dependence on oil revenues.

Environmentally, green financing is crucial for cutting carbon emissions and advancing sustainable resource management, enhanced by initiatives like the Green Middle East Initiative (Ghanem & Alamri, 2023) and supported by finance's role in aligning policies for carbon control (Shi *et al.* 2023). Projects funded through green financing typically focus on renewable energy, energy efficiency, and sustainable land use practices. For example, the implementation of solar energy projects not only contributes to energy diversification but also significantly reduces greenhouse gas emissions. According to a report by the Saudi Ministry of Energy, the Sakaka Solar Power Project alone is expected to displace approximately 300,000 tons of carbon dioxide annually, demonstrating the tangible environmental benefits that can arise from such investments. Furthermore, green financing encourages responsible resource management, ensuring that natural resources are utilized in a manner that does not compromise future generations' ability to meet their own needs.

The successful case studies presented in this paper further illustrate the effectiveness of green financing initiatives in advancing Saudi Arabia's sustainability agenda. The Sakaka Solar Power Project, for instance, has set a precedent for large-scale renewable energy projects in the country. This project not only enhances the renewable energy capacity of Saudi Arabia but also showcases the potential for public-private partnerships in financing sustainable initiatives. Additionally, the Red Sea Project represents another significant milestone, emphasizing eco-tourism and sustainable development while preserving the region's unique biodiversity. These case studies highlight that through strategic investments in green projects, Saudi Arabia can achieve its sustainability goals while simultaneously promoting economic growth and social development.

Reflecting on the significance of green financing in supporting Vision 2030, it is clear that achieving the ambitious targets set forth in this strategic plan requires a concerted effort from all stakeholders involved. Green financing is not just a financial mechanism; it represents a holistic approach to development that integrates economic, environmental, and social considerations. As Saudi Arabia seeks to transform its economy, it must prioritize green financing as a cornerstone of its development strategy. This necessitates fostering an environment where innovative financing mechanisms can flourish, enabling access to capital for sustainable projects across various sectors.

Moreover, the conclusion highlights the urgent need for research into innovative financing mechanisms, such as financial inclusion and green innovation, to strengthen green financing in Saudi Arabia (Singh *et al.* 2023), necessitating a shift in public financing from fossil fuels (Skovgaard *et al.* 2023). While significant progress has been made, there remain challenges that must be addressed to fully realize the potential of green financing. This includes exploring new financial instruments such as green bonds, which have gained popularity in international markets as a means to raise capital for environmentally beneficial projects. The introduction of such instruments in Saudi Arabia could provide additional funding sources for renewable energy projects and other sustainable initiatives. Moreover, understanding the intricacies of risk management and developing appropriate regulatory frameworks will be crucial in attracting private sector investments in green financing.

Achieving a sustainable future for Saudi Arabia requires robust public-private collaboration, leveraging energy and green factors to lower carbon intensity (Waheed, 2022) and utilizing public spending to foster green economic growth (Zhang *et al.* 2021). The government must play a proactive role in creating a conducive

environment for green investments, including establishing clear policies, offering incentives, and fostering partnerships with private entities. On the other hand, the private sector should actively engage in sustainable practices and seek out opportunities for innovation within the realm of green financing. By working together, these stakeholders can leverage their respective strengths to expand the reach of green financing, ultimately contributing to the achievement of Saudi Arabia's sustainable development goals.

To sum up, green financing offers a critical pathway for Saudi Arabia to address sustainable development challenges, underscored by empirical evidence on energy and green factors (Waheed *et al.* 2023) and strengthened by improved energy efficiency via green finance (Yu *et al.* 2022). It offers a promising framework for aligning economic growth with environmental stewardship, supporting the nation's efforts to diversify its economy while addressing pressing environmental concerns. As we move forward, it is imperative that Saudi Arabia continues to embrace green financing as a strategic priority, fostering an integrated approach that encompasses economic, social, and environmental dimensions of sustainability. By doing so, the Kingdom can pave the way for a resilient and sustainable future, fulfilling its aspirations under Vision 2030 and establishing itself as a leader in sustainable development in the region and beyond.

Declaration of Use of Generative AI and AI-Assisted Technologies

The author declares that he has not used generative AI and AI-assisted technologies during the preparation of this work.

References

[1] Abro, A. A., Alam, N., Murshed, M., Mahmood, H., Musah, M., & Rahman, A. A. (2023). Drivers of green growth in the Kingdom of Saudi Arabia: can financial development promote environmentally sustainable economic growth?. *Environmental Science and Pollution Research, 30*(9): 23764-23780. DOI:https://doi.org/10.1007/s11356-022-23764-9

[2] Abubakar, I. R., & Dano, U. L. (2020). Sustainable urban planning strategies for mitigating climate change in Saudi Arabia. *Environment, Development and Sustainability, 22*(6): 5129-5152. DOI:https://doi.org/10.1007/s10668-019-00423-5

[3] Abubakar, I. R., Aina, Y. A., & Alshuwaikhat, H. M. (2020). Sustainable development at Saudi Arabian universities: An overview of institutional frameworks. *Sustainability, 12*(19): 8008. DOI:https://doi.org/10.3390/su12198008

[4] Al-Kasasbeh, O., Al-Khazaleh, S. M., & Alsheikh, G. (2024). The dynamic impact of environmental sustainability, green finance, and FinTech on energy efficiency in Middle Eastern economies. *International Journal of Energy Economics and Policy, 14*(4): 574-579. DOI: https://doi.org/10.32479/ijeep.15691

[5] Al-Sarihi, A. (2019). Climate change and economic diversification in Saudi Arabia: Integrity, challenges, and opportunities. *Policy Paper, 1*(2019): 11-12.

[6] Al-Tamimi, N. (2017). A state-of-the-art review of the sustainability and energy efficiency of buildings in Saudi Arabia. *Energy Efficiency, 10*(5): 1129-1141. DOI: 10.1007/s12053-017-9507-6

[7] AlArjani, A., Modibbo, U. M., Ali, I., & Sarkar, B. (2021). A new framework for the sustainable development goals of Saudi Arabia. *Journal of King Saud University-Science, 33*(6): 101477. DOI:https://doi.org/10.1016/j.jksus.2021.101477

[8] Almulhim, A. I., & Al-Saidi, M. (2023). Circular economy and the resource nexus: Realignment and progress towards sustainable development in Saudi Arabia. *Environmental Development*, 46, 100851. DOI:https://doi.org/10.1016/j.envdev.2023.100851

[9] Alshubiri, F. (2021). Investment obstacles to sustainable development and competitiveness index. *Marketing Intelligence & Planning, 39*(2): 234-248. DOI: 10.1108/MIP-02-2019-0118

[10] Alshuwaikhat, H. M., & Mohammed, I. (2017). Sustainability matters in national development visions—Evidence from Saudi Arabia's Vision for 2030. *Sustainability, 9*(3): 408. DOI:https://doi.org/10.3390/su9030408

[11] Alwakid, W., Aparicio, S., & Urbano, D. (2021). The influence of green entrepreneurship on sustainable development in Saudi Arabia: The role of formal institutions. *International journal of environmental research and public health, 18*(10): 5433. DOI: https://doi.org/10.3390/ijerph18105433

[12] Amran, Y. A., Amran, Y. M., Alyousef, R., & Alabduljabbar, H. (2020). Renewable and sustainable energy production in Saudi Arabia according to Saudi Vision 2030; Current status and future prospects. *Journal of Cleaner Production*, 247: 119602. DOI: https://doi.org/10.1016/j.jclepro.2019.119602

[13] Ansari, D., & Holz, F. (2020). Between stranded assets and green transformation: Fossil-fuel-producing developing countries towards 2055. *World Development*, 130: 104947. DOI:https://doi.org/10.1016/j.worlddev.2020.104947.

[14] Anser, M. K., *et al.* (2020). Determination of resource curse hypothesis in mediation of financial development and clean energy sources: Go-for-green resource policies. *Resources Policy*, 66: 101640. DOI:https://doi.org/10.1016/j.resourpol.2020.101640

[15] Belloumi, M., & Alshehry, A. (2020). The impact of international trade on sustainable development in Saudi Arabia. *Sustainability, 12*(13): 5421.

[16] Ben Belgacem, S., Khatoon, G., & Alzuman, A. (2023). Role of renewable energy and financial innovation in environmental protection: empirical evidence from UAE and Saudi Arabia. *Sustainability, 15*(11): 8684. DOI:https://doi.org/10.3390/su12135421

[17] Chaaben, N., Elleuch, Z., Hamdi, B., & Kahouli, B. (2024). Green economy performance and sustainable development achievement: empirical evidence from Saudi Arabia. *Environment, Development and Sustainability, 26*(1): 549-564. DOI: https://doi.org/10.1007/s10668-022-02649-8

[18] Ghanem, A. M., & Alamri, Y. A. (2023). The impact of the green Middle East initiative on sustainable development in the Kingdom of Saudi Arabia. *Journal of the Saudi Society of Agricultural Sciences, 22*(1): 35-46. DOI: https://doi.org/10.1016/j.jssas.2022.06.001

[19] Islam, M. T., & Ali, A. (2024). Sustainable green energy transition in Saudi Arabia: Characterizing policy framework, interrelations and future research directions. *Next Energy*, 5: 100161. DOI:https://doi.org/10.1016/j.nxener.2024.100161

[20] Kahia, M., Jarraya, B., Kahouli, B., & Omri, A. (2024). The role of environmental innovation and green energy deployment in environmental protection: Evidence from Saudi Arabia. *Journal of the Knowledge Economy,* 15(1): 337-363. DOI: https://doi.org/10.1007/s13132-023-01337-5

[21] Kahia, M., Omri, A., & Jarraya, B. (2020). Does green energy complement economic growth for achieving environmental sustainability? evidence from Saudi Arabia. *Sustainability, 13*(1): 180. DOI:https://doi.org/10.1007/s13132-023-01337-5

[22] Khalil, R. G., Damrah, S., Bajaher, M., & Shawtari, F. A. (2023). Unveiling the relationship of ESG, fintech, green finance, innovation and sustainability: case of Gulf countries. *Environmental Science & Pollution Research,* 30(54). DOI: https://doi.org/10.1007/s11356-023-30554-2

[23] Khayat, R. O., Felemban, D. N., Altowairqi, T. K., & Aljahdali, M. O. (2023). Measurement of Saudi society environmental awareness in relation to 2030 Saudi vision and the Saudi green initiative. *Arab Journal for Scientific Publishing* (AJSP) ISSN, 2663, 5798.

[24] Liu, F. H., & Lai, K. P. (2021). Ecologies of green finance: Green sukuk and development of green Islamic finance in Malaysia. *Environment and Planning A: Economy and Space, 53*(8): 1896-1914. DOI:https://doi.org/10.1177/0308518X211038349

[25] Mahalik, M. K., Babu, M. S., Loganathan, N., & Shahbaz, M. (2017). Does financial development intensify energy consumption in Saudi Arabia?. *Renewable and Sustainable Energy Reviews*, 75: 1022-1034. DOI:https://doi.org/10.1016/j.rser.2016.11.097

[26] Matsuo, T., & Schmidt, T. S. (2017). Hybridizing low-carbon technology deployment policy and fossil fuel subsidy reform: a climate finance perspective. *Environmental Research Letters, 12*(1): 014002. DOI:http://dx.doi.org/10.1088/1748-9326/aa5384

[27] Rahman, K., Khondaker, S.M., Abubakar, A.N., Aina, Y. A., & Hasan, M. A. (2019). Renewable energy utilization to promote sustainability in GCC countries: policies, drivers, and barriers. *Environmental Science and Pollution Research*, 26. DOI: https://link.springer.com/article/10.1007/s11356-019-05337-1

[28] Ronaldo, R., & Suryanto, T. (2022). Green finance and sustainability development goals in Indonesian Fund Village. *Resources Policy*, 78: 102839. DOI: https://doi.org/10.1016/j.resourpol.2022.102839

[29] Saleem, H., Khan, M. B., & Mahdavian, S. M. (2022). The role of green growth, green financing, and eco-friendly technology in achieving environmental quality: evidence from selected Asian economies. *Environmental Science and Pollution Research, 29*(38): 57720-57739. DOI: 10.1007/s11356-022-19799-3

[30] Sarwar, S. (2022). Impact of energy intensity, green economy and blue economy to achieve sustainable economic growth in GCC countries: Does Saudi Vision 2030 matters to GCC countries. *Renewable energy*, 191: 30-46. DOI: https://doi.org/10.1016/j.renene.2022.03.121

[31] Shalhoob, H. (2023). Green sukuk in Saudi Arabia: Challenges and potentials of sustainability in the light of Saudi vision 2030. *Journal of Governance and Regulation/Volume, 12*(4). DOI:https://doi.org/10.22495/jgrv12i4siart15

[32] Sharif, A., Saqib, N., Dong, K., & Khan, S. A. R. (2022). Nexus between green technology innovation, green financing, and CO2 emissions in the G7 countries: the moderating role of social globalisation. *Sustainable Development, 30*(6): 1934-1946. DOI: https://doi.org/10.1002/sd.2360

[33] Shi, L., *et al.* (2023). Mediating role of finance amidst resource and energy policies in carbon control: a sustainable development study of Saudi Arabia. *Resources Policy*, 82, 103521. DOI:https://doi.org/10.1016/j.resourpol.2023.103521

[34] Singh, A. K., Raza, S. A., Nakonieczny, J., & Shahzad, U. (2023). Role of financial inclusion, green innovation, and energy efficiency for environmental performance? Evidence from developed and emerging economies in the lens of sustainable development. *Structural Change and Economic Dynamics*, 64: 213-224. DOI: https://doi.org/10.1016/j.strueco.2022.12.008

[35] Singh, H. P., Singh, A., Alam, F., & Agrawal, V. (2022). Impact of sustainable development goals on economic growth in Saudi Arabia: Role of education and training. *Sustainability, 14*(21): 14119. DOI:https://doi.org/10.3390/su142114119

[36] Skovgaard, J., Finkill, G., Bauer, F., Åhman, M., & Nielsen, T. D. (2023). Finance for fossils–The role of public financing in expanding petrochemicals. *Global Environmental Change*, 80: 102657. DOI:https://doi.org/10.1016/j.gloenvcha.2023.102657/

[37] Waheed, R. (2022). The significance of energy factors, green economic indicators, blue economic aspects towards carbon intensity: a study of Saudi vision 2030. *Sustainability, 14*(11): 6893. DOI:https://doi.org/10.3390/su14116893/

[38] Waheed, R., Sarwar, S., & Alsaggaf, M. I. (2023). Relevance of energy, green and blue factors to achieve sustainable economic growth: Empirical study of Saudi Arabia. *Technological Forecasting and Social Change*, 187: 122184. DOI: https://doi.org/10.1016/j.techfore.2022.122184

[39] Yu, M., Zhou, Q., Cheok, M. Y., Kubiczek, J., & Iqbal, N. (2022). Does green finance improve energy efficiency? New evidence from developing and developed economies. *Economic Change and Restructuring*, 1-25. DOI: https://doi.org/10.1007/s10644-021-09355-3

[40] Zhang, D., Mohsin, M., Rasheed, A. K., Chang, Y., & Taghizadeh-Hesary, F. (2021). Public spending and green economic growth in BRI region: mediating role of green finance. *Energy Policy*, 153: 112256. DOI:https://doi.org/10.1016/j.enpol.2021.112256

[41] International Renewable Energy Agency. (2019). Renewable energy and jobs – Annual review 2019. Available at: https://www.irena.org/publications/2019/May/Renewable-Energy-and-Jobs-Annual-Review-2019

[42] Kingdom of Saudi Arabia. (2021). Updated Nationally Determined Contribution under the Paris Agreement. Retrieved from https://unfccc.int/sites/default/files/NDC/2022-06/KSA%20NDC%202021%20-%20English.pdf

[43] Middle East Briefing. (2025, March 20). Saudi Arabia Unveils SR1 Billion Green Financing Initiative. Retrieved from https://www.middleeastbriefing.com/news/saudi-arabia-unveils-sr1-billion-green-financing-initiative/.

[44] Red Sea Global. (n.d.). Sustainability – The Red Sea Project. Retrieved from https://www.redseaglobal.com/en/our-commitments/sustainability

[45] Saudi Arabian Monetary Authority. (2021). Financial stability report 2021. Riyadh: Saudi Arabian Monetary Authority. Retrieved from https://www.sama.gov.sa/en-US/EconomicReports/Pages/FSR.aspx

[46] Saudi Ministry of Energy. (n.d.). National Renewable Energy Program – Sakaka Solar Project. Saudi Vision 2030. Retrieved from https://www.vision2030.gov.sa/en/programs/NREP.

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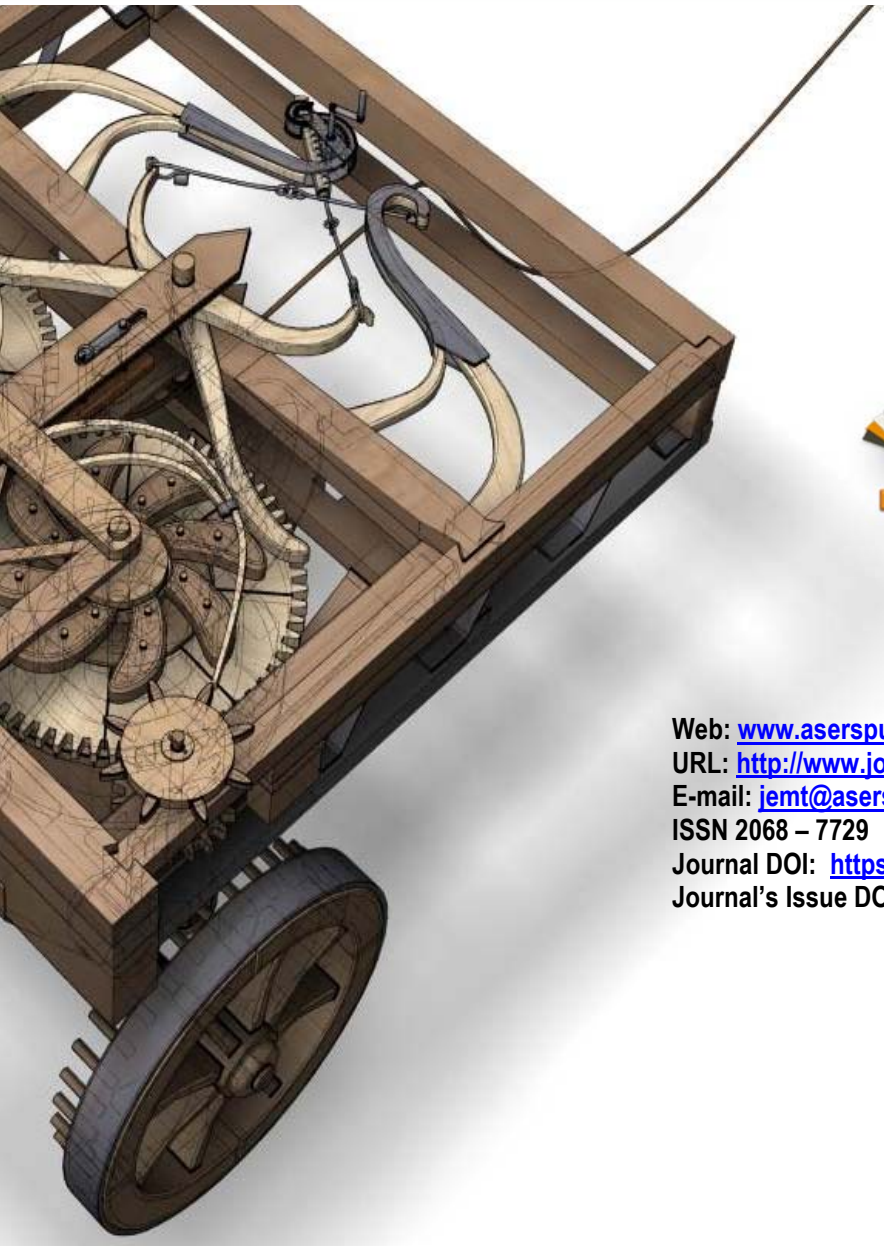

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