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Green Finance for Promoting Sustainable Economic Growth: Pathways and Challenges

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Abstract

In emerging nations, green financing has become a crucial mechanism for facilitating the transition toward sustainable development while ensuring continued economic growth. Green growth emphasizes expanding production capacity and resources while adopting green technologies and expertise to mitigate environmental degradation. This narrative review aims to examine the challenges and potential pathways of green financing in fostering sustainable economic growth by allocating financial resources to environmentally appropriate initiatives and identifying mechanisms to address key obstacles. Drawing on global practices and lessons from developing economies, the findings indicate that green finance significantly contributes to sustainable growth but is hindered by market imperfections, inadequate risk pricing, insufficient capital flows, and limited public awareness. The study highlights that policies, governmental regulations, and financial market interventions are critical in overcoming these challenges. Ultimately, leveraging technological advancements and innovative policy frameworks can strengthen the inclusiveness, efficiency, and transparency of green finance ecosystems, thereby supporting long-term sustainability.

Keywords: Economic growth, Environmental suitability, Green finance, Market imperfections

تمویل سبز برای ترویج رشد اقتصادی پایدار: راهکارها و چالش‌ها

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خلاصه

در کشورهای در حال ظهور، تمویل سبز به‌عنوان یک سازوکار اساسی برای تسهیل گذار به سوی انکشاف پایدار در عین حفظ رشد اقتصادی مطرح گردیده است. رشد سبز بر گسترش ظرفیت تولید و منابع همراه با به کارگیری تخنیک‌ها و تخصص‌های سبز برای کاهش تخریب محیط زیست تأکید می‌ورزد. این مرور روایتی به هدف بررسی چالش‌ها و راهکارهای نوین تمویل سبز در تقویت رشد اقتصادی پایدار انجام شده است، به ویژه از طریق تخصیص منابع مالی به ابتکارات سازگار با محیط زیست و شناسایی سازوکارهای برای مقابله با موانع عمده. با استفاده از تجارب جهانی و آموزه‌های به دست‌آمده از اقتصادهای در حال انکشاف، یافته‌ها نشان می‌دهد که تمویل سبز سهم قابل توجهی در رشد پایدار دارد، اما با مشکلاتی چون نارسایی‌های بازار، نبود قیمت‌گذاری درست ریسک، کمبود سرمایه و سطح پایین آگاهی عامه مواجه است. نتایج تحقیق نشان می‌دهد که پالیسی‌ها، مقررات دولتی و مداخلات بازارهای مالی در رفع این چالش‌ها نقش محوری دارند. در نهایت، استفاده از

پیشرفت‌های تکنالوژیکی و ابتکارات پالیسی می‌تواند شمولیت، کارایی و شفافیت نظام‌های تمویل سبز را تقویت نموده و از پایداری درازمدت حمایت نماید.

کلیمات کلیدی: رشد اقتصاد، پایداری محیط زیست، تمویل سبز، نقص های بازار

Introduction

As developing economies strive to achieve a balance between economic expansion and sustainable development, green finance has emerged as a pivotal instrument in facilitating this transition. The principle of green growth is to continuously improve manufacturing capacity, reduce environmental pollution by utilizing green technology and knowledge, and expand energy and resource efficiency. With environmental concerns receiving increasing global attention, sustainable development has become a central objective for economic transformation. In this context, green finance has gained significant attention as a crucial tool for achieving sustainable development objectives (Zhu, 2024).

The concept of a green economy presents an al-ternative development pathway that aims to improve living standards while adhering to sustainability ideals. This approach promotes a triple-bottom-line strategy prioritizing economic, environmental, and social welfare simultaneously. The urgency of adopting green finance is rooted in the growing calls over the past decade to ensure fair management of natural resources, slow their depletion, and prevent catastrophic consequences for future gener-ations. Tracking progress toward the 2030 Sustainable Development Goals further reveals that achieving several targets depends significantly on Goal 12 concerning sustainable consumption and production (Kumar et al., 2024).

Historically, nations have emphasized economic growth and wealth accumulation, often at the expense of environmental sustainability. One of the defining challenges of the twenty-first century is therefore maintaining planetary habitability while balancing economic expansion. By lowering carbon emissions, using resources responsibly, and fostering technological innovation, the green growth paradigm aims to reconcile economic growth with environmental sustainability. As a result, this notion is being embedded into both domestic and international policy frameworks as a fundamental component of Sustainable Development Goals

Green growth unites two seemingly opposing ideas: the need to reduce the adverse environmental impacts of production and the necessity of economic expansion to alleviate poverty. Unlike conventional growth models, green growth seeks to minimize pollution, address environmental risks, and promote eco-friendly enterprises, products, and business models that enhance quality of life. Jacobs et al., (2013) distinguishes between “normal” and “vigorous” green growth. The conventional interpretation posits that environmental preservation yields long-term economic benefits, suggesting that eco-friendly policies eventually boost economic performance. The vigorous interpretation, however, argues that environmental policy itself can directly stimulate economic growth.

Building on this perspective, Mahmood et al., (2024) stresses that strong policies in G-20 nations—such as green financing, environmental taxes, strict regulations, strategic investments, renewable energy, and education—are essential to accelerate green growth by ensuring both economic expansion and environmental sustainability. Aligned with these perspectives, green finance emphasizes integrating financial resources and business operations with environmentally sustainable practices (Qing et al., 2024). It promotes eco-friendly initiatives such as purchasing sustainable products and services or investing in green infrastructure.

Shinde and Kumar (2023) identifies five main types of green finance: Green Mortgages, Green Loans, Green Credit Cards, Green Banks, and Green Bonds. Moreover, green financing is considered a Corporate Social Responsibility (CSR) activity of financial institutions such as banks, mutual funds, and stock companies (Koo, 2010). This implies that even if green finance is not yet fully viable, financial firms should implement it as part of their CSR agendas. Conceptually, green financing is a targeted mechanism that directs capital through public interventions to pursue economic growth, environmental improvement, and the advancement of the financial sector simultaneously.

The rationale of this study lies in its potential to address pressing challenges of sustainability while promoting inclusive economic development. Specifically, it seeks to explore the challenges and emerging pathways of green financing and to analyze its role in promoting sustainable economic growth by drawing upon global practices and lessons from developing economies. The main objectives are: (1) to encourage sustainable economic growth through the allocation of funds to ecologically appropriate initiatives, and (2) to tackle the primary obstacles in green financing by creating efficient mechanisms. By uncovering the potential of green financing, this research offers valuable implications for policymakers, financial institutions, and stakeholders, enabling them to design strategies that channel resources toward projects contributing to environmental protection, social equity, and long-term economic advancement.

Methodology

For this narrative review, a comprehensive search of multiple reputable databases was conducted, including PubMed, Scopus, Embase, ScienceDirect, Google Scholar, as well as relevant institutional and organizational reports. The literature search employed a wide range of keywords such as Sustainable Development Goals, Environmental Sustainability, Climate Change Risk, Importance of Green Finance, and Principles of Green Finance. To ensure consistency, only publications available in the English language were included. A broad spectrum of study designs—comprising prospective cohort studies, retrospective studies, review articles, and policy reports—published up to 2025 were considered eligible. The inclusion of diverse sources was intended to capture both empirical evidence and conceptual discussions relevant to the theme of green finance. Each selected publication was evaluated for its scientific rigor, its contribution to advancing sustainable development discourse, and its role in strengthening emerging pathways of green financing. This methodological approach ensured a comprehensive synthesis of the most relevant and credible literature available, thereby providing a solid foundation for the analysis presented in this review.

Results and discussion

Table 1 displays a summary of previous studies that have examined different facets of green finance and its ramifications. These studies cover a wide range of subjects, from assessing how green finance has developed in certain areas to investigating the obstacles and opportunities of green finance for promoting sustainable economic growth. Additionally, they look into how green finance might support sustainability, its impact on environmental performance, and its connection to economic growth. In addition, these studies evaluate how various nations have advanced the field of green finance. Every study adds distinct perspectives and discoveries that advance our knowledge of green finance and its complex effects on environmental and economic dynamics.

Table 1. Summary of Authors, and Key Results

No	Author	Key Results
1	(Trukhachev & Dzhikiya, 2023)	This study has theoretical significance because it highlights the unique feature of green finance in the artificial intelligence (AI) era, which is that it can only fully develop by depending on intelligent technology. Additionally, the increasing use of smart technology will increase the competitiveness of green finance and accelerate.
2	(Yan et al., 2022)	The results show that green finance and green innovation, which also have a significant positive influence on sustainability performance, completely mediate the adoption of FinTech and the sustainability performance of banking institutions.
3	(Yousaf & Fazal, 2022)	The results show that economic growth, the use of green finance, and the production and consumption of renewable energy all have positive environmental sustainability ES.

4	(Zhu, 2024)	The article concludes by emphasizing that green finance is a key force leading the transformation of the global economy. It not only plays a role in the environmental field but also serves a vital role in promoting the green transformation of enterprises and promoting the upgrading of economic structure.
5	(Mahmood et al., 2023)	The findings indicate that green finance significantly influences sustainable infrastructure development, as hypothesized. This suggests that increased investments in GF can lead to substantial improvements in infrastructure that support sustainability goals. Furthermore, the study confirms the positive impact of GF on GTI, highlighting the essential role of financial mechanisms in driving technological advancements that promote environmental sustainability. The mediating role of sustainable infrastructure between GF and the three dimensions of SDGs social, economic, and environmental sustainability was also supported by our results. This indicates that sustainable infrastructure serves as a crucial conduit through which GF can realize broader sustainability outcomes.
6	(Alhejaili, 2024)	Key findings from this research indicate that while Saudi Arabia has made commendable strides in establishing a foundational framework for green finance, there remain inherent challenges in fully operationalizing these initiatives. These include the need for standardized metrics for evaluating environmental impacts, the complexity of aligning diverse stakeholder interests, and the imperative for cultural shifts within financial institutions towards sustainability. Despite these challenges, Saudi's commitment to enhancing transparency, fostering technological innovation, and integrating Environmental, Social, and Governance (ESG) criteria into financial practices signals a promising future for green finance in Saudi Arabia.
7	(Chen et al., 2023)	1). China's manufacturing sector is undergoing a considerable green transition thanks to the use of green finance. 2). The impact of only state-owned industries is heavily promoting green finance for the manufacturing sector's green transformation; 3). The impact of green finance on the manufacturing sectors green transformation efficiency (with a better information environment) is greater than that of manufacturing sectors with a worse information environment. 4) The manufacturing sector's green transformation is significantly impacted by green finance promotion in low-competition industries but not in high-competition ones.
8	(Khan et al., 2021)	The current research results demonstrate that the ecological footprint is considerably harmed by mitigation funding. The diagnostic problems related to Since FE parameters are important; we consider Driscoll-Kraay and PCSE as substitute robustness standards, which provide comparable outcomes. An alternative way to assess the ecological footprint is through CO2 emissions, which likewise produces findings that are in line with mitigation finance. Since they cover a shorter period, the commitment-based measure that took effect on January 1, 2017, is not included in the study's statistics on climate mitigation funding (approval-based). Future studies will examine climate financing commitment-based metrics and Asian subregions with recipients.
9	(Bakry et al., 2023)	The findings demonstrate the integration of carbon (CO2) emissions with urbanization, renewable energy, green financing, and real gross domestic product.

Source: (Tabulated by Author)

The narrative review of the selected studies highlights two main themes, Challenges to Green Finance and Pathways for Green Finance.

(i) Challenges to Green Finance:

Green finance faces multiple challenges that limit its effectiveness in promoting sustainable economic growth, particularly in developing and emerging economies. Competitive constraints at both country and sector levels reduce the attractiveness of private investments. Mispricing or lack of pricing of risks, including those associated with emerging technologies and unstable policy environments, further impedes capital mobilization. Market distortions, such as continued subsidies for fossil fuels, along with competing objectives among governments, private investors, and host-country policymakers, create additional conflicts. Limited access to capital, low awareness among firms, insufficient expertise in integrating environmental and financial knowledge, and regulatory gaps, including inadequate technical and monitoring frameworks, further restricted participation, especially for small and medium-sized enterprises. These challenges collectively reflect systemic limitations that slow the adoption of sustainable practices and complicate the integration of economic, environmental, and social objectives in green finance initiatives (Sundararajan & Vivek, 2014).

(ii) Pathways to Green Finance:

Despite these challenges, several strategies have been identified to strengthen and expand green finance initiatives. Information-building policies, transparency, and verification mechanisms help investors and stakeholders recognize green finance as an opportunity rather than a risk, thereby enhancing market participation. Environmental regulations, such as the removal of harmful subsidies, pollution control standards, and improvements in sector governance, create supportive institutional frameworks. The development of structured green markets, including carbon trading schemes, and public financing mechanisms, such as subsidies for renewable energy and sustainable infrastructure, attract private capital by reducing initial investment risks. Strengthening regulatory frameworks, establishing monitoring and performance evaluation systems, and promoting research, development, and innovation through grants, subsidies, and tax incentives are essential pathways to foster an inclusive, efficient, and sustainable green finance ecosystem. By systematically implementing these strategies, policymakers and financial institutions can enhance investment flows, balance economic growth with environmental protection, and create a resilient and inclusive green finance environment capable of achieving long-term sustainability objectives (Sundararajan & Vivek, 2014; Mahmood et al., 2024; Zhu and Yu, 2024).

Conclusion

This narrative review demonstrates that green finance is a vital mechanism for promoting sustainable economic growth while addressing environmental and social objectives. The findings indicate that green finance has significant potential to drive economic development, support sustainability, and improve social well-being. However, its implementation faces multiple challenges, including limited access to capital, low awareness and expertise among firms and stakeholders, mispricing or inadequate assessment of investment risks, market distortions due to subsidies for non-sustainable practices, competing objectives among governments, private investors, and host-country policymakers, as well as gaps in regulatory frameworks and technical infrastructure. Overcoming these barriers is essential to fully leverage green finance for achieving long-term economic growth, environmental protection, and social equity. The review underscores that with appropriate policies, clear standards, and strategic interventions, green finance can become an inclusive, resilient, and effective tool for sustainable development.

Recommendations

To enhance the effectiveness of green finance, several strategic measures are recommended. Policymakers should strengthen regulatory frameworks and establish clear standards for green technologies, sustainable infrastructure, and financing mechanisms to reduce uncertainty and attract investment. Raising awareness and transparency among investors, businesses, and consumers is critical to ensure informed decision-making and active participation in green finance initiatives. Public-private collaboration, including grants, subsidies, and tax incentives, can bridge funding gaps and encourage investment in environmentally sustainable projects. Developing structured markets for green financial products, such as carbon trading schemes and green bonds, will facilitate efficient capital allocation and risk-sharing. Additionally, investing in research, development, and innovation in green technologies, as well as capacity-building and professional training, will accelerate the transition to a low-carbon economy.

Finally, monitoring and evaluation mechanisms should be implemented to track progress, assess outcomes, and adapt strategies to maximize the impact of green finance initiatives on economic, environmental, and social objectives.

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