

Green Finance: A New Paradigm for Sustainable Banking

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Abstract

Green finance has emerged as a critical instrument in transforming traditional banking practices toward sustainability in response to escalating environmental challenges and climate change risks. This paper examines the evolving concept of green finance and its role in advancing sustainable banking, with a focus on the Indian context within emerging Asian economies. It highlights how financial institutions are increasingly integrating environmental, social, and governance (ESG) considerations into lending and investment decisions, while also supporting environmentally responsible economic activities. Using a descriptive and exploratory research design, the study analyzes secondary data from policy reports, institutional publications, and academic literature to assess the current status and impact of green finance initiatives. The findings indicate that green finance enhances environmental performance, institutional credibility, and long-term financial resilience, while also facilitating access to capital for sustainable enterprises, including small and medium enterprises (SMEs). However, its implementation is constrained by challenges such as regulatory ambiguity, high transition costs, limited technical expertise, and low awareness, particularly among smaller firms. The study underscores the role of banking institutions as key enablers of sustainable development and emphasizes the need for policy support, capacity building, and innovative financial instruments. It concludes that strengthening green finance frameworks can significantly contribute to sustainable economic growth and responsible financial intermediation in emerging economies.

Keywords: Green Finance; Sustainable Banking; Sustainable Entrepreneurship; Small and Medium Enterprises (SME)s; Emerging Economies

1. Introduction

The need to achieve sustainable development has become a world agenda following the increasing environmental concerns and the rising issues on climate change. The need to have environmentally responsible economic systems has been compounded by rising global temperatures, extreme weather events, loss of biodiversity, and rising levels of pollution. This does not only apply to ecological spheres but these environmental threats have started playing a major role in economic stability, societal well-being and long-term development trends (Brunetti et al., 2021). Here, financial institutions, especially banks, are highly instrumental in the development of sustainable outcomes because they allocate capital within sectors, influence where investment is made, and the course of economic growth. The capacity of banking systems to integrate sustainability in making financial decisions has thus become a fundamental issue in combating environmental issues globally.

Historically, the old banking system has been focused on profitability, efficiency and returns to shareholders and in most cases they never considered the impact of their lending and investment practices on the environment. Massive industrial growth, the reliance on fossil fuel, and the infrastructure that relies on resources in terms of size and structure have historically been heavily

funded without systematic evaluation of their environmental dangers. This has been a way of degrading the environment as well as exposing the financial systems to the long term risks such as stranded assets and disruptions in regulations. With the spread of knowledge about these risks, the understanding that financial systems need to become more than just oriented towards short-term profits has grown, with an increasing awareness that financial systems need to be designed to be more sustainably oriented. This change has given rise to the birth of green finance as a revolutionary method of financial intermediation (Hu & Gan, 2025; Dhayal et al., 2025).

Green finance is a paradigm shift in the operations of the financial system, as it incorporates the environmental, social, and governance (ESG) factors in making decisions related to finances. It covers a broad spectrum of financial resources, policies and plans aimed at realizing a green growth. They encompass green bonds, sustainability-linked loans, investment funds that focus on climate aspects, and ESG-based risk assessment models (Rahman et al., 2022; Yameen et al., 2024). Green finance can ensure that economic growth is in line with the environmental sustainability by channeling financial resources to renewable energy, clean technology, energy efficiency, sustainable agriculture, green infrastructure, and climate-resilient development. It also pushes financial institutions to have

responsible lending practices and integrate climate-related risks into their business models, therefore increasing their environmental and financial resilience (Ojha, 2025; Dewi et al., 2024).

In the emerging economies like India, the applicability of green finance is more especially since there is a dual challenge of attaining economic growth and at the same time environmental sustainability. India is becoming more vulnerable to the environment with rising temperatures, water shortage, air pollution, and climate-related disruptions, at the same time, undergoing a booming industrialization and urbanization. The increasing energy demands and infrastructural demands in the country further enhance the necessity to have sustainable financing mechanisms. India has in turn ensured international commitments to green finance initiatives through the United Nations Sustainable Development Goals (SDGs), the Paris Agreement, which has hastened the uptake of green finance initiatives (Chandran & Chandran, 2024; Judijanto et al., 2024). This shift towards sustainable finance has been enhanced by regulatory trends and international institutions (Citaristi, 2022).

Meanwhile, one should not exclude the role of small and medium enterprises (SMEs) and start-ups in developing economies. These are important economic development, job-creating, and innovation-driven enterprises. SMEs can work in sectors that can implement sustainable and environmentally friendly methods, like renewable energy, waste management, sustainable agriculture, and green manufacturing. Yet, irrespective of their significance, SMEs often have significant obstacles to obtaining finance particularly on projects that incorporate green technologies or sustainable business approaches. Their inability to raise funds through conventional banking mechanisms is usually limited by high upfront costs of investment, risk perception, limited collateral, and technical know-how (Aliano et al., 2024; Mustafa et al., 2025). Green finance in this regard offers a solution to the issue of the disconnect between financial institutions and sustainable businesses through the provision of access to capital by environmentally-sound projects.

Green finance introduction into the banking systems thus goes beyond the considerations of the environment and includes wider economic and entrepreneurial development. Financial institutions can be useful in encouraging innovation, competitiveness, and inclusive growth by enabling sustainable business models. In addition, the transition to green finance can enhance the financial stability of financial institutions in the long term by decreasing the risks associated with climate change and aligning investment holdings with future regulatory and market trends (Nagina, 2025).

Although these benefits may exist, the adoption of green finance has not been even with issues of regulatory uncertainty, absence of standardized frameworks, insufficient awareness and high transition costs still being problems that impact the adoption of green finance.

It is against this background that there is an increasing necessity of systematic studies that assess the functions of green finance in changing the banking practices and helping sustainability in the emerging economies. Although the conceptual and policy aspects of green finance have been discussed in the literature, the practical implications of the concept have not been examined, especially in the banking systems and in the entrepreneurial ecosystems. This paper attempts to fill this gap by assessing the role of green finance in transforming banking practices in India and its success in achieving sustainable banking coupled with embracing economic growth.

2. Research Methodology

2.1 Research Design

The proposed research design is descriptive and exploratory research design that will explore the changing role of green finance in the promotion of sustainable banking in India. The former is the descriptive method that allows presenting the up-to-date state, tendencies, and institutional changes connected to green finance in a logical way, and the latter allows gaining a better insight into the new trends, issues, and opportunities in the banking sector. This integrated design is especially appropriate as the field of green finance is changing, with only theoretical frameworks and practical application still being developed. The research will produce information on the ways in which financial institutions are incorporating environmental, social, and governance (ESG) factors in their operations and decision making processes.

2.2 Sample Design and Selection

This paper will be founded on a purposive sample consisting of 50 banking institutions in India, comprising of both public and private sector banks. The choice of banks was informed by their engagements in sustainability practices, existence of ESG disclosures, and access to green financial instruments like green bonds and sustainable lending practices. This sample is a good reflection of the Indian banking industry and the sample includes the differences on scale, ownership structure and strategic orientation. The incorporation of both government and commercial sector banks presents the opportunity to have a comparative insight into the ways in which various institutional structures affect the adoption and implementation of green finance practices.

2.3 Sources of Data Collection

The research uses solely secondary research, which is suitable in this context, as the research is rather broad in terms of its institutional scope and policy focus. Various sources of information that are reliable and authoritative in nature were consulted to achieve reliability and completeness in collecting data. These are official documents of the reserves bank of India (RBI) and the Securities and Exchange Board of India (SEBI) that deal with guidelines of regulations, policy frameworks and financial information concerning the green finance. Moreover, annual reports, and sustainability reports of some chosen banks were examined in order to evaluate institutional practices, ESG disclosures, and green financing initiatives.

Additionally, theoretical developments, empirical findings and world best practices in green finance and sustainable banking were comprehended through peer-reviewed academic journals. National and international policy documents and reports were also studied to put the Indian experience in terms of global sustainability models. The application of various secondary sources makes the study more in-depth and credible as it gives quantitative indicators as well as qualitative information.

2.4 Data Analysis Techniques

A blend of qualitative content analysis and descriptive analysis was used to analyze the data collected. The descriptive analysis has been used to determine trends, patterns, and growth indicators of green finance initiative, including growth of green bonds, adoption of ESG, and allocation of funds to the sector. Policy documents, sustainability reports and institutional disclosures were interpreted using qualitative content analysis to gain insight into how

banks are strategically oriented and how they operate towards green finance.

This methodology allowed identifying the main themes, such as the impact on the environment, institutional advantages, regulatory issues, and barriers to implementation. The analysis helps to gain a clear picture of the present situation in the field of green finance in India and the potential of sustainable banking by synthesizing information on several sources.

2.5 Limitations of the Methodology

Although the research is an informative piece, it has some methodological weaknesses. The use of secondary data limits the possibility to get real-time viewpoints and experience of banking professionals and stakeholders. Moreover, the differences in reporting criteria and ESG reporting among institutions can influence the comparability of data. Nevertheless, the limitations do not critically undermine the methodology of attaining the objectives of the study since the methodology relies on credible and generally accepted sources of data.

3. Results

3.1 Growing Adoption of Green Finance

The review of literature shows that there has been a substantial and strong growth in the use of green finance practices in India. According to the RBI reports and SEBI disclosures and institutional publications, the cumulative green bond issuances have been in the range of USD 20-25 billion that depicts the increasing interest and involvement of investors. This trend is well depicted in Figure 1 where it is evident that the green bond issuances have been on an upward trend between 2020 and 2025.

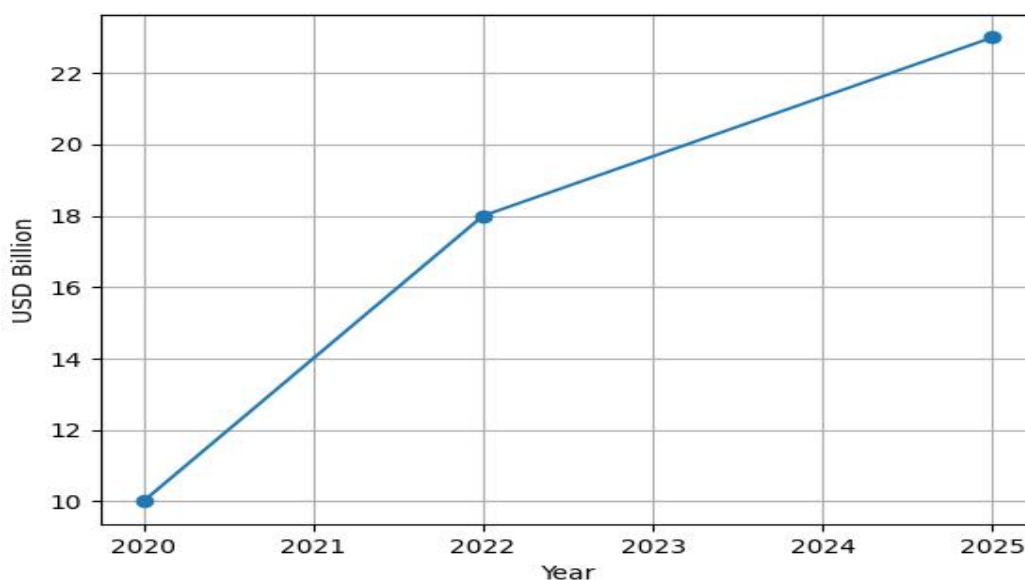


Figure 1. Trend of Green Bond Issuance in India

In addition, major banks report on sustainability shows a growing tendency to align themselves with international frameworks, including the Task Force on Climate-related Financial Disclosures (TCFD). Table 1 illustrates that all the key indicators,

including ESG adoption, the renewable energy capacity, and the growth of the ESG funds, show a strong upward trend. The results indicate that the Indian banks are increasingly incorporating ESG factors in their activities which is a shift towards sustainable and climate-friendly banking.

Table 1. Growth of Green Finance Indicators in India

Indicator	2020	2022	2024-25 (Approx.)	Trend
Green Bond Issuance (USD Billion)	10	18	20-25	Increasing
ESG Adoption (Top Companies %)	30%	65%	90%+ (BRSR)	Rapid Growth
Renewable Energy Capacity (GW)	90	150	180-200	Strong Growth
ESG Funds (₹ Billion)	25	70	100+	Increasing

3.2 Environmental Impact and Sectoral Contribution

Policy-level policy documents and reports on the sector reveal a content analysis that reveals that green finance has been instrumental in ensuring environmentally sustainable sectors. Green financing mechanisms have enabled investments in the development of renewable energy capacity in

India that is already close to 180-200 GW with a target of 500 GW by 2030.

Figure 2 shows the sector-wise representation of green finance, which shows that the highest number of sectors (about 50%) comprise renewable energy, then infrastructure (25%), agriculture (12%), water and waste management (8%) and other sectors (5%).

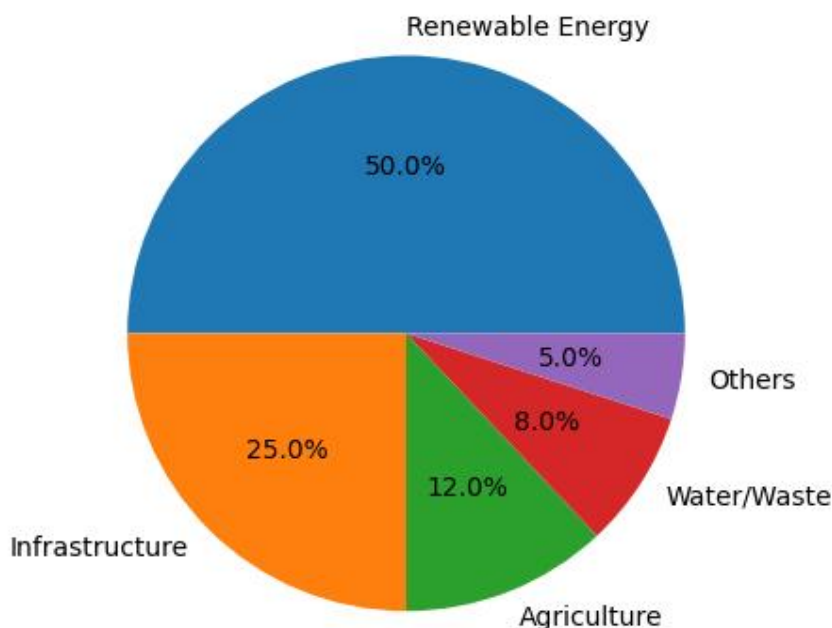


Figure 2. Sector-wise Distribution of Green Finance

Table 2, which gives a breakdown sectoral distribution, also supports this distribution. The results show that renewable energy is the leading industry, and the strategic significance of investments in clean energy in the sustainability of India is highlighted.

Table 2. Sectoral Allocation of Green Finance in India

Sector	Share (%)	Key Activities
Renewable Energy	45-50%	Solar, Wind Projects
Infrastructure	20-25%	Green buildings, transport
Agriculture	10-15%	Sustainable farming
Water & Waste Management	8-10%	Recycling, water treatment
Others	5-10%	Clean tech, ESG funds

3.3 Institutional Benefits and Financial Performance

In analyzing the topic, the study establishes that there are various institutional benefits of green finance practices by banks. The sustainability reports and scholarly research indicate that banks that integrate ESG systems have an enhanced brand image and enjoy enhanced investor trust, especially among investors who are ESG oriented.

In summary, green finance leads to environmental, financial, and institutional returns, as summarized in Table 3, such as improved risk management and long-term profitability. Incorporation of climate risk into banking business minimizes the exposure to bad assets and dead investments. The results suggest that not only does sustainable banking uphold environmental ambitions but also enhances financial stability and institutional resilience.

Table 3. Key Benefits and Challenges of Green Finance

Dimension	Benefits	Challenges
Environmental	Reduced emissions, climate resilience	Lack of green taxonomy
Financial	Long-term profitability, risk reduction	High transition cost
Institutional	Brand value, investor trust	Limited ESG expertise
Regulatory	Policy support (RBI, SEBI)	Fragmentation, unclear guidelines

3.4 Implementation Challenges and Constraints

Though the implementation of green finance has increased, there are a number of challenges that still obstruct the effective implementation of green finance in India. Policy report and academic literature analysis show that no standard green taxonomy exists and as a result, there are variations in the classification and reporting. The issue of regulatory fragmentation and the changing compliance requirements also adds uncertainty to financial institutions.

Moreover, transition costs that may be incurred in switching to green technologies and the lack of technical competence in ESG evaluation can be considered a significant obstacle especially to smaller institutions. Table 3 also demonstrates these challenges as it identifies important constraints and benefits. These problems need to be dealt with to make green finance scalable and to be effectively implemented in the Indian banking industry.

3.5 Implications for Sustainable Development

The results indicate that green finance is highly promising in facilitating sustainable development through harmonizing financial flows and environmental goals. The growing trend toward the use of ESG practices, growth of green investments, and diversification of sectors are positive indications of the transition to sustainable banking.

Nevertheless, to ensure the success of green finance, it is essential to empower regulatory frameworks, the capacity of institutions, and access to finance among sectors. As a solution to these issues, green finance can be a game-changer to attain the sustainable economic growth and responsible financial intermediation in emerging economies.

4. Discussion

This research report reveals the increasing importance of green finance in changing the banking practice and facilitating sustainability in the Indian setting. The rising pattern of green bonds issue, as

depicted in Figure 1, is a reflection of a wider pattern in the financial sector in relation to environmentally friendly strategies in investment. This tendency is consistent with the international experience indicating the growing importance of green finance to meet the objectives of sustainable development and enhance energy security (Sachs et al., 2019; Taghizadeh-Hesary and Yoshino, 2019). The growth of green financial products, especially green bonds, shows that regulatory encouragement as well as investor demand is pushing the change towards sustainable banking practices (Flammer, 2021).

The sectoral allocation of green finance as shown in Figure 2 and in Table 2 shows a strong focus in the investments made in renewable energy. The discovery aligns with the previous studies emphasizing the role of green finance in facilitating clean energy transitions and decreasing carbon emissions (Ng and Tao, 2016; Zhang et al., 2021). The preponderance of renewable energy investments is associated with the interests of the countries in terms of climate commitments and energy security. Nonetheless, the comparatively less investment in other industries like agriculture and water management points to the necessity of a more balanced strategy to guarantee a holistic environmental sustainability (Zhou et al., 2020).

Table 3 has also identified institutional benefits that further support the strategic significance of the green finance to the banking institutions. Better brand reputation, confidence of investors and better risk management ability are some signs that sustainability is becoming a fundamental part of financial strategy. The results are consistent with the available literature, which shows that green finance also leads to financial stability by decreasing risk exposure to climate-related risks and increasing the long-term profitability (Campiglio, 2016; D'Orazio and Popoyan, 2019). Besides, the idea of ESG considerations as an element of banking business is in tandem with universal principles of

responsible banking and sustainable financial practices (UNEP, 2019).

Although these are encouraging trends, the research finds that there are a number of challenges which restrict the success of green finance programs. The absence of a standardized green taxonomy and fragmentation in regulations poses ambiguities in defining and execution of green financial activities. The same issues are raised in the literature on sustainable finance on the international level, where the consistency of the policy framework and uniform reporting processes are underscored (G20 Sustainable Finance Study Group, 2018; Hafner et al., 2020). The adoption of green finance is also constrained by high transition costs and a lack of technical know-how, especially in the developing economies where the institutional capacities can be restricted (Volz, 2018).

The other key implication of the findings is also associated with the contribution of green finance to the overall economic development. The findings indicate that green finance does not only help in making the environment sustainable but also may play an important role in ensuring sustainable economic growth. It complies with the previous research that indicates a beneficial correlation between green finance and economic growth, especially in the emerging economies (Soundarrajan & Vivek, 2016). Green finance helps to protect the environment and enhance economic stability by making investments in sustainable infrastructure and clean technologies.

On the whole, this discussion suggests that green finance can serve as a paradigm shifting tool to streamline financial systems to be sustainability-oriented. Although the fact that green financial instruments are increasingly being adopted is a positive development, there is still a need to meet structural and regulatory issues to maximize its effectiveness. Ensuring the successful implementation of green finance initiatives will be essential through strengthening institutional frameworks, better coordination of policies, and technical capabilities.

Finally, the results and their discussion support the idea that green finance is an important factor that can facilitate sustainable banking practices in India. The evidence proves the thesis that the involvement of environmental considerations in financial systems can increase economic and environmental performance, which leads to the sustainable long-term development.

5. Conclusion

Green finance has emerged as a transformative approach in redefining traditional banking practices by integrating environmental sustainability with financial decision-making. This study examined the role of green finance in promoting sustainable

banking in India and found that its adoption is steadily increasing, supported by regulatory initiatives, growing investor awareness, and expanding financial instruments such as green bonds. The findings confirm that green finance contributes significantly to environmental sustainability by channeling investments into renewable energy, green infrastructure, and climate-resilient sectors. Additionally, it enhances institutional performance by improving risk management, strengthening financial stability, and increasing investor confidence through ESG integration. However, the study also identifies several challenges, including the lack of a standardized green taxonomy, regulatory fragmentation, high transition costs, and limited technical expertise, which hinder its widespread implementation. Despite these constraints, the long-term benefits of green finance outweigh the associated challenges, making it a crucial tool for achieving sustainable economic development. The study supports the alternative hypothesis, indicating that green finance has a significant positive impact on sustainable banking practices. It further highlights the need for stronger policy frameworks, capacity-building initiatives, and improved accessibility of green financial instruments to ensure inclusive growth. Overall, green finance holds substantial potential to align financial systems with sustainability goals, enabling the Indian banking sector to contribute effectively to environmental protection, economic resilience, and long-term sustainable development.

References

1. Aliano, M., Cestari, G., & Madonna, S. (2024). Sustainable finance for SMEs. *SUSTAINABLE FINANCE*.
2. Brunetti, C., Dennis, B., Gates, D., Hancock, D., Ignell, D., Kiser, E. K., & Tabor, N. K. (2021). Climate change and financial stability.
3. Campiglio, E. (2016). Beyond carbon pricing: The role of banking and monetary policy in financing the transition to a low-carbon economy. *Ecological economics*, 121, 220-230.
4. Chandran, R., & Chandran MC, S. (2024). Green finance and sustainability: mapping research development through bibliometric analysis. *Discover Sustainability*, 5(1), 339.
5. Citaristi, I. (2022). Organisation For Economic Co-Operation And Development—OECD. In *The Europa Directory of International Organizations 2022* (pp. 694-701). Routledge.
6. D'Orazio, P., & Popoyan, L. (2019). Fostering green investments and tackling climate-related financial risks: Which role for macroprudential policies?. *Ecological Economics*, 160, 25-37.
7. Dewi, N. S., Gunawan, V. C., & Indriani, F. (2024). Advancing Sustainable Economies Through

- Green Banking: A Systematic Review. *Research Horizon*, 4(6), 117-126.
8. Dhayal, K. S., Shashwat, S., & Giri, A. K. (2025). Conceptualizing green finance: Findings from textual and network analysis. *Heliyon*, 11(4).
 9. Flammer, C. (2021). Corporate green bonds. *Journal of financial economics*, 142(2), 499-516.
 10. Hafner, S., Jones, A., Anger-Kraavi, A., & Pohl, J. (2020). Closing the green finance gap—A systems perspective. *Environmental Innovation and Societal Transitions*, 34, 26-60.
 11. Hu, D., & Gan, C. (2025). Green finance development and its origin, motives, and barriers: an exploratory study. *Environment, Development and Sustainability*, 1-25.
 12. Judijanto, L., Mokodenseho, S., Mokodompit, A. T., Mamonto, M., & Lantong, S. M. (2024). Trends in sustainable banking practices: A bibliometric review of green financial services and risk management strategies. *Jurnal Multidisiplin West Science*, 3(03), 305-313.
 13. Mustafa, N. H., Jaffar, R., Jusop, M., Fadhil, N. F. M., & Hashim, H. A. (2025, December). The Relationship between Green Finance Awareness and Sustainable Competitiveness of SMEs. In *Proceedings of the 4th International Conference on Economic, Business, and Accounting Studies (ICEBAST 2025)* (p. 197). Springer Nature.
 14. Nagina, R. (2025, May). Effectiveness of green financing activities and performance management on banking sector: An empirical study. In *Web Intelligence* (Vol. 23, No. 2, pp. 195-212). Sage UK: London, England: Sage Publications.
 15. Ng, T. H., & Tao, J. Y. (2016). Bond financing for renewable energy in Asia. *Energy Policy*, 95, 509-517.
 16. Ojha, D. (2025). Green Banking and Sustainability—A Systematic Literature Review. *Victoria Journal of Management*, 2(2), 56-79.
 17. Rahman, S., Moral, I. H., Hassan, M., Hossain, G. S., & Perveen, R. (2022). A systematic review of green finance in the banking industry: perspectives from a developing country. *Green Finance*, 4(3), 347.
 18. Sachs, J. D., Woo, W. T., Yoshino, N., & Taghizadeh-Hesary, F. (2019). Importance of green finance for achieving sustainable development goals and energy security. *Handbook of green finance*, 3, 1-10.
 19. Soundarrajan, P., & Vivek, N. (2016). Green finance for sustainable green economic growth in India. *Agricultural Economics/Zemědělská Ekonomika*, 62(1).
 20. Sustainable Finance Study Group. (2018). Sustainable finance synthesis report. New York: G20 Sustainable Finance Study Group.
 21. Taghizadeh-Hesary, F., & Yoshino, N. (2019). The way to induce private participation in green finance and investment. *Finance Research Letters*, 31, 98-103.
 22. UNEP, F. (2019). *Principles for responsible banking: Guidance document*.
 23. Volz, U. (2018). Fostering green finance for sustainable development in Asia. In *Routledge handbook of banking and finance in Asia* (pp. 488-504). Routledge.
 24. Yameen, J., Kijkasiwat, P., Hussain, A., Farooq, M. A., & Ajmal, T. (2024). Green finance in banking industry: A systematic literature review. *SN Business & Economics*, 4(8), 91.
 25. 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.
 26. Zhou, X., Tang, X., & Zhang, R. (2020). Impact of green finance on economic development and environmental quality: a study based on provincial panel data from China. *Environmental Science and Pollution Research*, 27(16), 19915-19932.