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Bibliometric Analysis of Green Finance and Sustainable Investment Strategies

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ABSTRACT

Green finance and sustainable investment strategies have gained significant attention as key mechanisms to address global environmental challenges and drive sustainable development. This study employs bibliometric analysis to explore the thematic, geographical, and temporal trends in research on green finance and sustainable investments, using data from the Scopus database. The findings reveal that central themes, such as "sustainability," "green economy," and "investments," dominate scholarly discourse, with growing emphasis on emerging topics like "green technology innovation" and "decentralized finance." China, the United Kingdom, and European nations are identified as leading contributors to research in this field, with notable collaborations across regions. However, disparities in regional representation and challenges such as inconsistent ESG frameworks and perceived financial risks hinder the adoption of green finance globally. The study highlights opportunities for harmonizing global standards, leveraging technological innovations, and expanding research in underrepresented regions. These insights provide valuable guidance for policymakers, financial institutions, and researchers aiming to enhance the effectiveness of green finance and sustainable investments.

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1. INTRODUCTION

The increasing recognition of climate change and environmental degradation has spurred significant transformations in global financial systems. Green finance, which integrates environmental considerations into financial decision-making, has become a pivotal strategy to address pressing environmental challenges. Green bonds, sustainable investment funds, and climate financing are examples of instruments that have emerged to channel capital toward projects and initiatives aligned with sustainability goals [1]. The United Nations' Sustainable Development Goals (SDGs), particularly those related to climate action, clean energy, and sustainable cities, emphasize the critical role of financial systems in achieving global sustainability objectives

[2]. As the urgency to mitigate climate risks intensifies, the focus on green finance has transitioned from a niche concern to a mainstream priority across economies.

Sustainable investment strategies are closely tied to the principles of green finance. These strategies aim to incorporate environmental, social, and governance (ESG) criteria into investment decisions, ensuring that financial gains align with ethical and ecological responsibilities. Investors are increasingly prioritizing portfolios that not only deliver returns but also contribute to the betterment of society and the environment [3]. This shift is evident in the growing adoption of ESG metrics by corporations, institutional investors, and policymakers. As a result, green finance and sustainable investments are no longer viewed solely as instruments for environmental stewardship but also as pathways for economic growth and resilience [4].

Despite the promising outlook, challenges remain in advancing green finance and sustainable investment strategies. Limited access to green finance for small and medium enterprises (SMEs), lack of standardized ESG reporting frameworks, and discrepancies in regulatory approaches hinder the global adoption of these practices [5]. Moreover, the concept of greenwashing, where firms exaggerate their environmental commitments, poses a significant threat to the credibility of green finance [6]. Addressing these barriers requires robust research to understand the dynamics and impact of green finance and sustainable investment strategies across regions and sectors.

Bibliometric analysis offers a valuable approach to exploring the evolution of research in green finance and sustainable investments. By examining the scholarly landscape, this method enables researchers to identify publication trends, influential studies, key thematic areas, and collaborative networks [7]. This analytical tool is particularly crucial for identifying knowledge gaps, facilitating evidence-based policymaking, and fostering collaboration between academics and practitioners. In the context of green finance, bibliometric analysis provides a comprehensive overview of the research ecosystem, uncovering the trajectories and intersections of sustainability and finance.

Despite the growing prominence of green finance and sustainable investment strategies, there is limited consolidated knowledge regarding the evolution of research in this domain. The literature is dispersed across multiple disciplines, including economics, environmental science, and finance, making it challenging to synthesize findings and discern overarching trends. Moreover, regional variations in research outputs, methodologies, and thematic focuses contribute to the fragmented understanding of how green finance is shaping global financial landscapes. The absence of a systematic and quantitative analysis of the research trajectory hinders stakeholders, including policymakers, investors, and academics, from leveraging the insights needed to advance green finance initiatives effectively. This gap underscores the need for a comprehensive bibliometric analysis to map the current state and future potential of this critical field. This study aims to conduct a bibliometric analysis of green finance and sustainable investment strategies to provide a structured and quantitative overview of research trends, influential works, and thematic developments.

2. LITERATURE REVIEW

2.1 Conceptual Framework of Green Finance

Green finance has emerged as a multidimensional concept that encompasses financial instruments, policies, and strategies designed to support sustainable development and mitigate environmental challenges. At its core, green finance integrates environmental considerations into traditional financial systems by redirecting capital flows toward green

projects, including renewable energy, sustainable infrastructure, and climate resilience [3]. Scholars emphasize that green finance is a critical enabler for achieving global sustainability goals, as it aligns economic growth with environmental preservation [8]. Additionally, green bonds, carbon trading schemes, and green loans have gained traction as key mechanisms within the green finance ecosystem, fostering the transition to low-carbon economies.

Several studies highlight the role of financial institutions and governments in promoting green finance. For instance, the establishment of regulatory frameworks, such as the EU Green Taxonomy, has provided clarity on what constitutes a green activity, thereby encouraging investments in sustainable projects [9]. Similarly, financial institutions play a pivotal role by adopting risk assessment tools that incorporate climate risks and by offering preferential financing terms for environmentally friendly projects [6]. These measures have paved the way for the mainstreaming of green finance, yet challenges such as limited awareness, data availability, and market maturity remain significant barriers.

2.2 Evolution of Sustainable Investment Strategies

Sustainable investment strategies have undergone significant evolution over the past few decades. Initially, such strategies were largely driven by ethical considerations, where investors excluded industries or companies associated with negative social or environmental impacts, such as tobacco, firearms, or fossil fuels [10]. However, the focus has shifted toward a more comprehensive integration of environmental, social, and governance (ESG) factors into investment decision-making. ESG integration reflects a proactive approach where investors evaluate the potential financial and non-financial performance of companies based on their sustainability practices [11].

One of the most widely studied areas of sustainable investment is the relationship between ESG performance and financial returns. Research indicates that companies with strong ESG credentials often exhibit lower volatility, enhanced risk management, and long-term profitability [12]. Moreover, institutional investors such as pension funds and mutual funds are increasingly incorporating ESG criteria into their portfolios, driven by the dual objectives of financial performance and positive societal impact. Despite this progress, inconsistencies in ESG metrics and the lack of universal reporting standards continue to pose challenges for investors seeking reliable data for decision-making [13].

2.3 Linkages Between Green Finance and Sustainable Investments

The interdependence between green finance and sustainable investment strategies is a recurring theme in academic and policy literature. Both concepts aim to create financial systems that support sustainability while addressing climate risks and promoting

resource efficiency. Green finance provides the foundational infrastructure, such as financial products and regulatory policies, that enable sustainable investments to thrive [14]. Conversely, sustainable investments generate demand for green financial instruments, creating a mutually reinforcing dynamic that accelerates progress toward sustainability goals.

Empirical studies demonstrate that green finance initiatives, such as green bonds, often attract sustainable investors who prioritize ESG-aligned portfolios. For example, the issuance of green bonds has grown exponentially, with countries like China, the United States, and the European Union leading the way [15]. Such instruments provide transparency and accountability, offering investors confidence in the environmental impact of their investments. Similarly, sustainable investment funds and impact investing have emerged as powerful tools for channeling private capital into projects that deliver both financial returns and measurable social or environmental benefits [16].

2.4 *Barriers to the Adoption of Green Finance and Sustainable Investments*

Despite the growing interest in green finance and sustainable investments, several barriers hinder their widespread adoption. One significant challenge is the lack of harmonized standards and definitions across countries and regions. For instance, what qualifies as a "green" investment in one jurisdiction may not meet the criteria in another, creating confusion and inefficiencies in global markets. Similarly, variations in ESG reporting frameworks make it difficult for investors to compare and evaluate sustainability performance across companies and sectors [17].

Another critical barrier is the perception of higher financial risks associated with green investments. While studies indicate that sustainable investments often deliver competitive returns, there remains skepticism among traditional investors regarding the profitability and scalability of green projects [10]. Furthermore, the underdevelopment of green finance markets in emerging economies limits access to capital for small and medium enterprises (SMEs), which are vital drivers of innovation and sustainability.

2.5 *Bibliometric Trends in Green Finance and Sustainable Investment Research*

Bibliometric analyses provide valuable insights into the trends, patterns, and emerging areas of research in green finance and sustainable investments. Recent bibliometric studies reveal a significant increase in academic publications on these topics, reflecting their growing importance in scholarly discourse [18]. Key research themes include the integration of ESG factors into financial decision-making, the impact of green finance policies on economic growth, and the role of sustainable investments in achieving climate goals.

Additionally, bibliometric analyses highlight the geographic concentration of research outputs, with developed countries such as the United States, China, and European nations contributing the majority of publications. This trend underscores the need for more research efforts from developing regions, which often face unique challenges in implementing green finance and sustainable investment strategies [19]. Co-citation and keyword analyses further reveal the interdisciplinary nature of this field, with connections to economics, environmental science, and policy studies.

3. METHODS

This study employs a bibliometric analysis approach to systematically examine the scholarly landscape of green finance and sustainable investment strategies. Data for the analysis were collected from the Scopus database, ensuring comprehensive coverage of peer-reviewed publications from 2008 to 2024. Search queries utilized keywords such as "green finance," "sustainable investment," "ESG criteria," and "climate finance" to identify relevant articles. The data were analyzed using bibliometric tool such as VOSviewer to map co-authorship networks, citation trends, keyword co-occurrences, and thematic evolution over time. Additionally, descriptive statistics were used to analyze publication trends, prominent authors, journals, and geographic distribution of research outputs.

4. RESULTS AND DISCUSSION

4.1 Descriptive Analysis

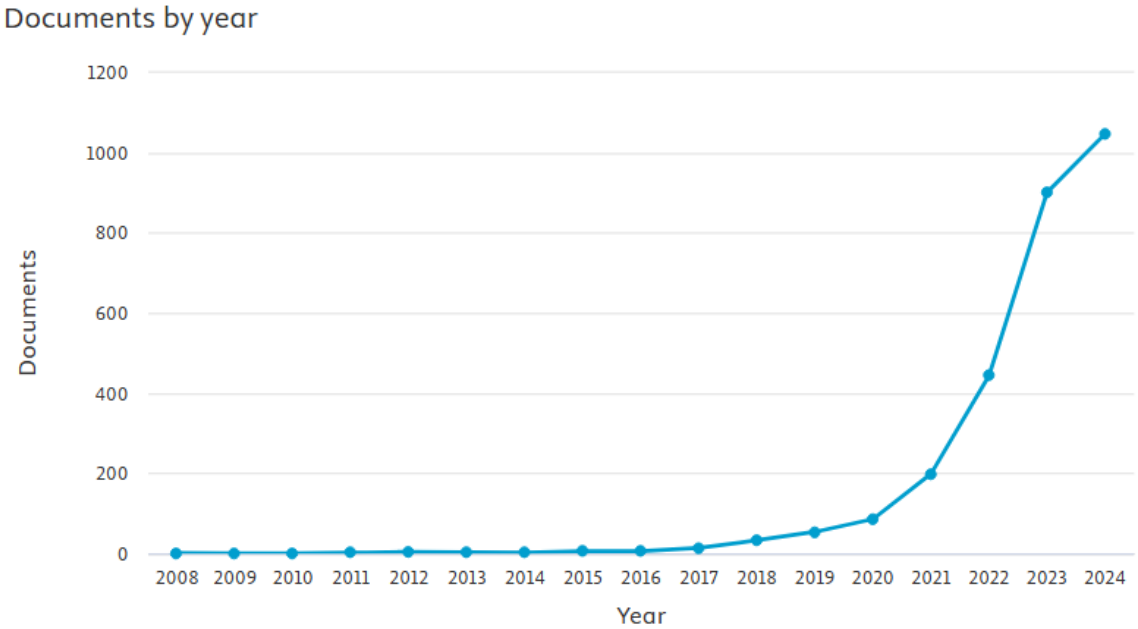

Figure 1. Documents by Year

Source: Scopus, 2024

The chart illustrates the exponential growth in the number of documents published annually on green finance and sustainable investment strategies from 2008 to 2024. For over a decade, from 2008 to 2018, the number of publications remained relatively low, with minimal growth. However, from 2019 onwards, a sharp upward trend is

observed, with the number of documents significantly increasing each year. The steepest rise occurred between 2021 and 2024, reflecting a surge in academic and policy interest in these topics. This rapid growth aligns with heightened global attention to climate change, sustainability goals, and the integration of environmental considerations into financial systems, driven by initiatives like the United Nations' Sustainable Development Goals and increased regulatory focus on ESG (Environmental, Social, and Governance) factors. The trend indicates that green finance has transitioned from a niche area to a central topic in academic and policymaking circles.

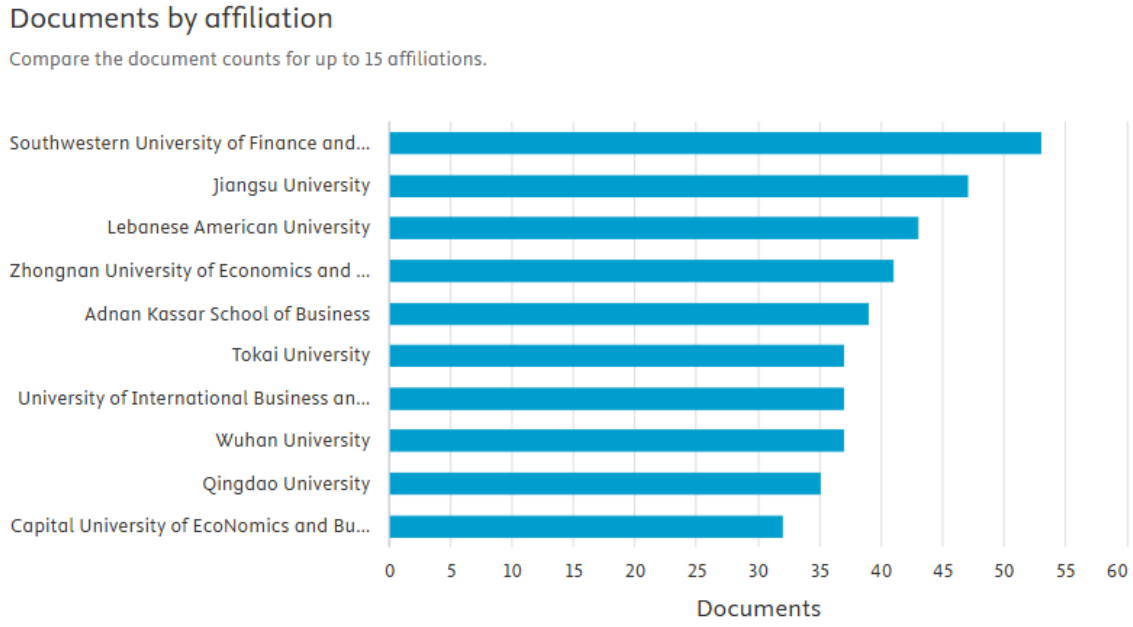

Figure 2. Documents by Affiliation
Source: Scopus, 2024

The bar chart highlights the top affiliations contributing to research on green finance and sustainable investments. Southwestern University of Finance and Economics leads with the highest number of published documents, followed closely by Jiangsu University and Lebanese American University. Other notable institutions include Zhongnan University of Economics and Law, Adnan Kassar School of Business, and Tokai University. This distribution reflects a strong contribution from Chinese universities, emphasizing China's dominant role in advancing research on green finance. The presence of institutions from diverse regions, including Lebanon and Japan, indicates the global nature of research in this domain. The chart underscores the significant involvement of academic institutions specializing in finance, economics, and business, reflecting their critical role in shaping scholarly discourse and policy frameworks for green finance and sustainability. This trend also highlights opportunities for collaboration across institutions to foster innovation and address regional and global challenges in green finance

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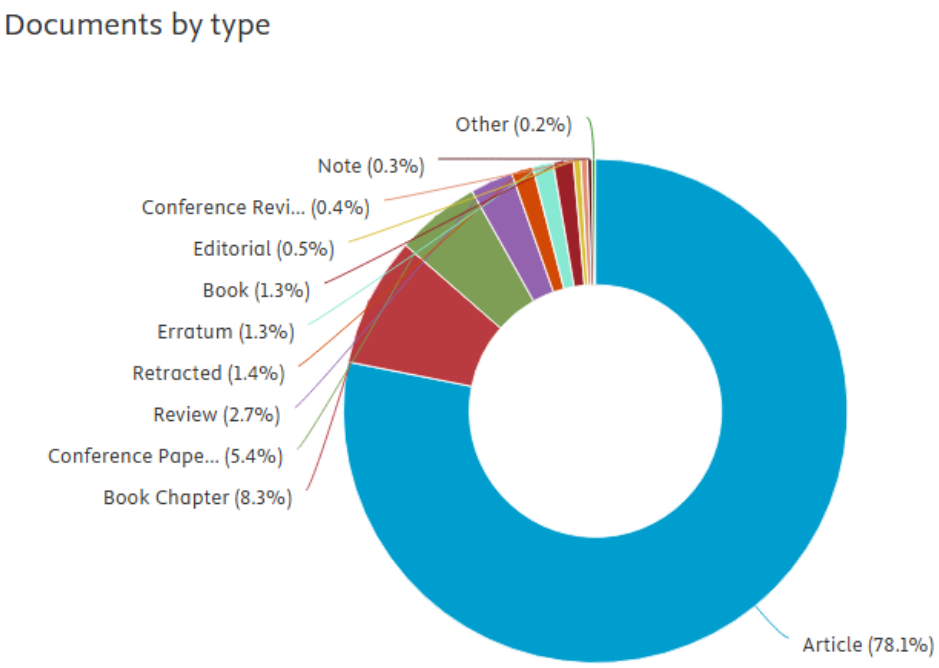

Figure 3. Documents by Type
Source: Scopus, 2024

The pie chart illustrates the distribution of document types related to research on green finance and sustainable investments. The majority of the publications, 78.1%, are research articles, emphasizing the centrality of peer-reviewed journal articles in advancing scholarly discourse in this field. Book chapters account for 8.3% of the total, reflecting contributions to broader edited volumes. Conference papers (5.4%) also play a role in disseminating early-stage findings and fostering academic dialogue. Reviews constitute 2.7%, indicating a growing effort to synthesize existing knowledge. Other categories, such as books (1.3%), editorials (0.5%), and notes (0.3%), contribute minimally but highlight the diversity of publication formats. The relatively low presence of retracted articles (1.4%) and errata (1.3%) indicates a general reliability in the research outputs. Overall, the dominance of journal articles underscores the reliance on rigorous, peer-reviewed studies to explore and expand the knowledge base on green finance and sustainability.

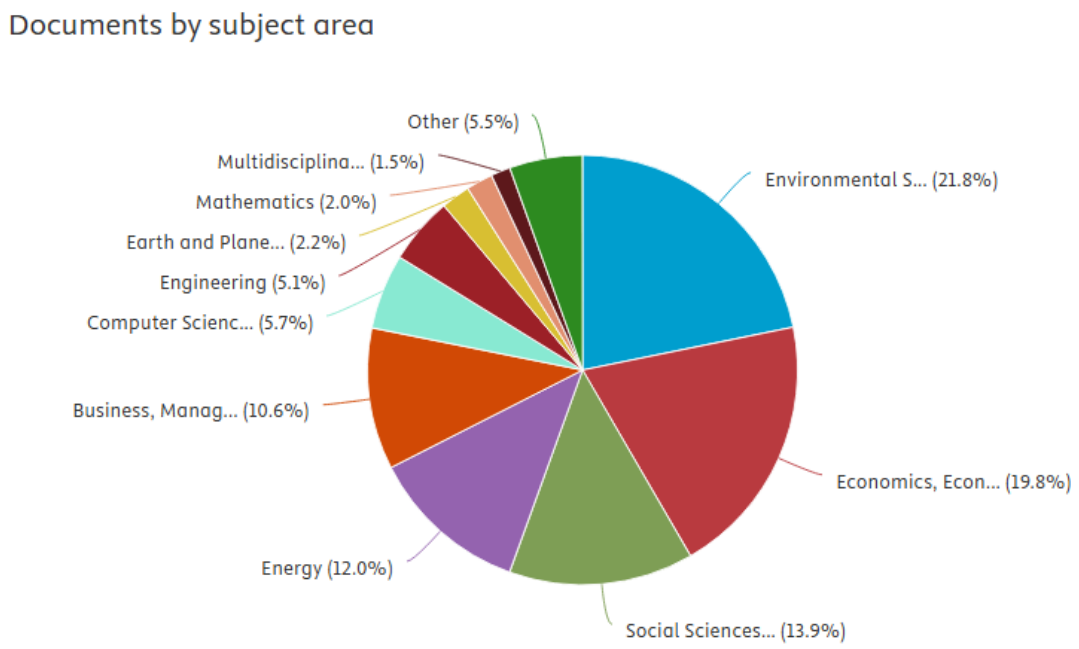

Figure 4. Documents by Subject Area
Source: Scopus, 2024

The pie chart presents the distribution of documents related to green finance and sustainable investments across various subject areas. Environmental sciences dominate the research landscape, accounting for 21.8% of the total, reflecting the central role of environmental considerations in green finance. Economics follows closely at 19.8%, highlighting the financial and policy aspects critical to this field. Social sciences (13.9%) and energy (12.0%) also contribute significantly, indicating the interdisciplinary nature of the research, which spans societal impacts and energy transitions. Business and management (10.6%) emphasizes the application of green finance in corporate strategies. Engineering (5.1%) and computer science (5.7%) point to the growing importance of technological innovations in advancing sustainability goals. Smaller contributions from mathematics (2.0%) and multidisciplinary studies (1.5%) underscore the diverse analytical methods employed. Overall, the chart demonstrates the integration of environmental, economic, and technological perspectives, highlighting the need for continued interdisciplinary research in this dynamic field.

4.2 Citation Analysis

Table 1. Top Cited Research

Citations	Authors and year	Title
487	[20]	The way to induce private participation in green finance and investment
411	[21]	Influence mechanism between green finance and green innovation: Exploring regional policy intervention effects in China
408	[22]	Beyond carbon pricing: The role of banking and monetary policy in financing the transition to a low-carbon economy
357	[23]	Fostering green development with green finance: An empirical study on the environmental effect of green credit policy in China
355	[24]	Role of green finance in improving energy efficiency and renewable energy development

Citations	Authors and year	Title
329	[25]	Does green finance development goals affects renewable energy in China
313	[26]	Sustainable solutions for green financing and investment in renewable energy projects
301	[27]	The green advantage: Exploring the convenience of issuing green bonds
222	[28]	A step forward on sustainability: The nexus of environmental responsibility, green technology, clean energy and green finance
194	[29]	A review of studies on green finance of banks, research gaps and future directions

Source: Scopus, 2024

4.3 Keyword Co-Occurrence Network Analysis

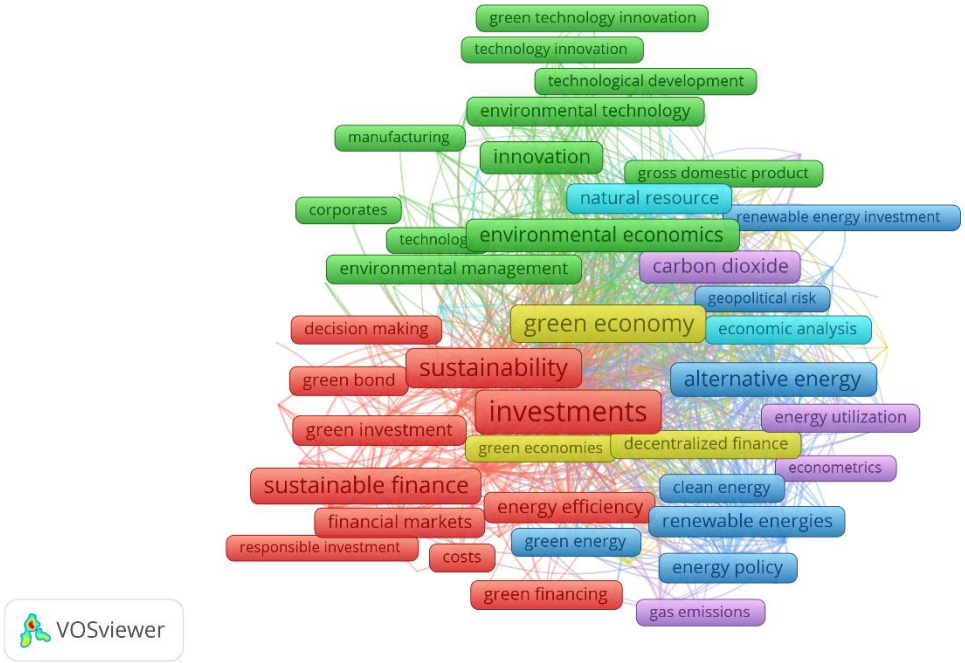

Figure 5. Network Visualization
Source: Data Analysis Result, 2024

The visualization highlights key research themes and their interconnections within the fields of green finance and sustainable investment. The most prominent nodes, such as "sustainability," "green economy," "investments," and "sustainable finance," indicate central topics that dominate the scholarly discourse. These themes are densely connected, reflecting their interdependence in promoting environmentally and socially responsible financial systems. The network structure suggests that sustainability serves as a focal point, bridging discussions on investments, energy policies, and technological innovation. The network is segmented into distinct clusters, represented by different colors, which indicate thematic groupings. For example, the red cluster revolves around "sustainable finance," "investments," and "financial markets," emphasizing the role of financial instruments and markets in fostering sustainability. The green cluster focuses on "technology innovation," "environmental technology," and "natural resource," highlighting the intersection of innovation and resource management in green finance. The blue cluster captures themes related to

"alternative energy," "renewable energies," and "energy policy," reflecting the emphasis on transitioning to cleaner energy sources. The interconnections between nodes indicate that research in this domain is highly interdisciplinary. For instance, "green economy" links to topics such as "environmental management," "carbon dioxide," and "green energy," illustrating the integration of economic and environmental considerations. Similarly, "energy efficiency" and "renewable energies" are strongly connected to "green financing," demonstrating the financial sector's critical role in supporting clean energy projects. This interconnectedness highlights the collaborative nature of green finance, where multiple disciplines, including economics, environmental science, and technology, converge. The visualization also sheds light on emerging trends and potential research gaps. Nodes such as "geopolitical risk," "decentralized finance," and "technological development" suggest growing areas of interest in the context of green finance and sustainable investments. These emerging themes underscore the need for more research on the impact of global risks and technological advancements on green financial systems. Additionally, the relatively smaller size of nodes such as "gas emissions" and "clean energy" indicates areas where further exploration and integration into the broader discourse may be valuable for advancing the field.

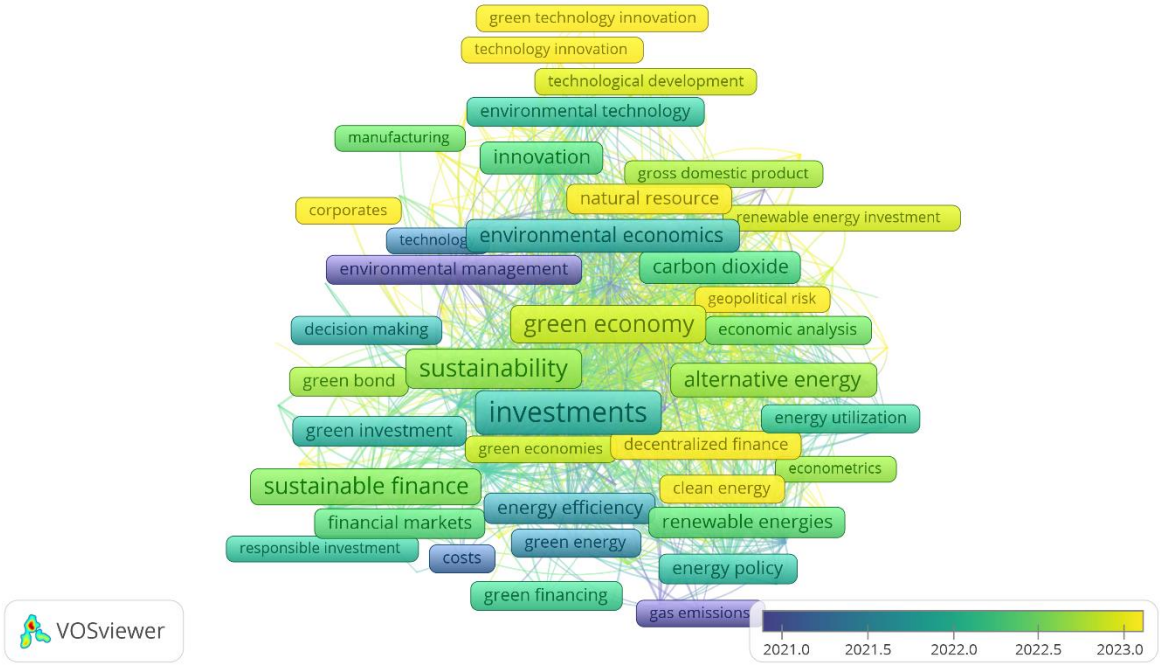

Figure 6. Overlay Visualization
Source: Data Analysis Result, 2024

The visualization illustrates the thematic distribution and temporal progression of research topics in green finance and sustainable investments, as represented by the color gradient. Topics such as "green technology innovation," "technological development," and "environmental technology" (highlighted in yellow) indicate emerging areas of interest, primarily concentrated in the years 2022 to 2023. This reflects a growing focus on technological advancements as enablers of sustainability, emphasizing the role of innovation in addressing environmental challenges. Conversely, foundational themes such as "sustainability," "investments," and "green

economy" (represented in green and blue hues) suggest consistent attention from earlier periods. The network highlights a strong interconnection between technology and financial strategies. Nodes like "green financing," "energy efficiency," and "renewable energies" showcase the interplay between financial instruments and energy transitions, while newer nodes such as "decentralized finance" point to the integration of innovative financial technologies. Additionally, "geopolitical risk" and "carbon dioxide" connect with "green economy" and "environmental management," demonstrating how contemporary challenges are influencing financial and investment strategies. The temporal distribution indicates that these linkages have gained momentum more recently, reflecting evolving priorities in global sustainability discourse. Emerging topics such as "green technology innovation," "renewable energy investment," and "economic analysis" present opportunities for further exploration. The prominence of yellow-highlighted nodes suggests that recent studies have shifted toward integrating economic and technological frameworks in green finance. However, smaller nodes like "gas emissions" and "geopolitical risk" indicate research gaps that warrant deeper investigation. The visualization underscores the growing importance of multi-disciplinary approaches, combining environmental science, economics, and technology, to advance the field of sustainable investments and green finance.

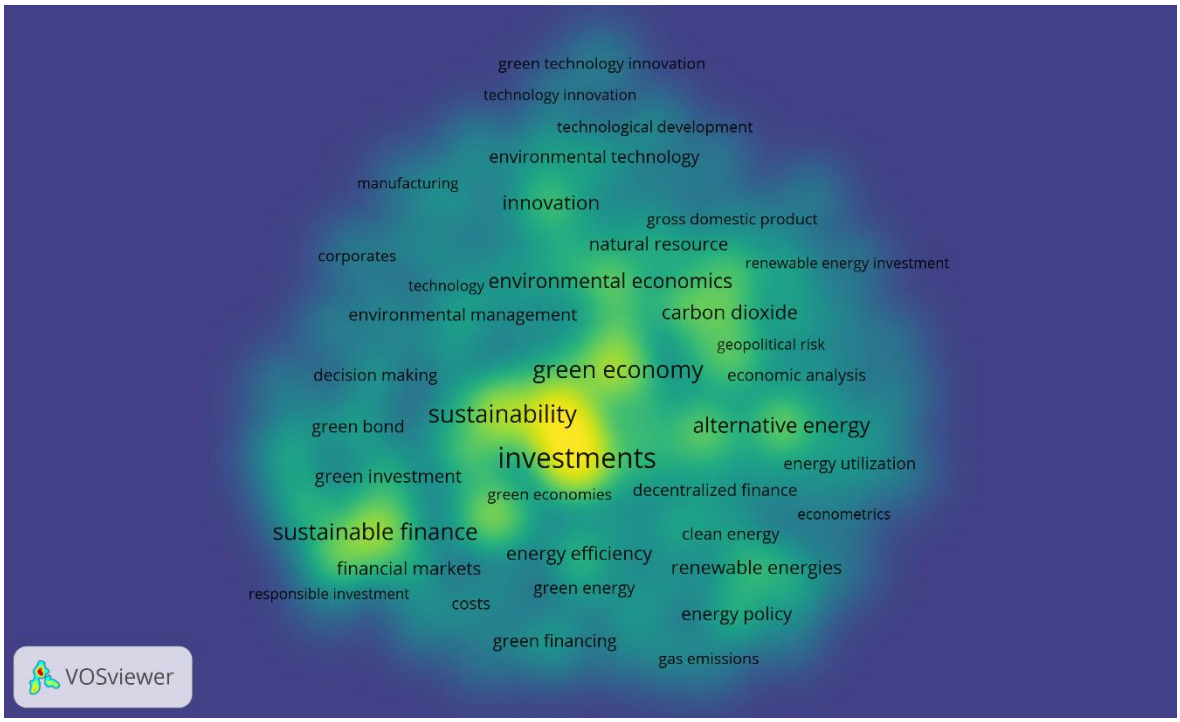

Figure 7. Density Visualization

Source: Data Analysis, 2024

The heatmap visualization illustrates the intensity of research focus within the fields of green finance and sustainable investment. Central themes like "sustainability," "investments," and "green economy" exhibit the highest density, as indicated by the bright yellow regions. These terms represent foundational areas in the discourse, reflecting their critical importance in academic and policy-oriented research. The proximity of related nodes such as "sustainable finance," "energy efficiency," and "renewable energies" indicates a strong interconnection among key topics, emphasizing their relevance in advancing financial systems aligned with environmental

and social goals. Moving outward from the central themes, nodes such as "technological innovation," "geopolitical risk," and "carbon dioxide" appear in less dense regions, marked by cooler colors. These areas represent emerging or specialized topics that are gaining traction but have not yet reached the central focus of the broader discourse. For example, "green technology innovation" and "decentralized finance" suggest increasing interest in the role of advanced technologies and novel financial mechanisms in promoting sustainability. This visualization highlights both well-established research priorities and potential opportunities for further exploration, particularly in underrepresented or emerging areas.

4.4 Co-Authorship Network Analysis

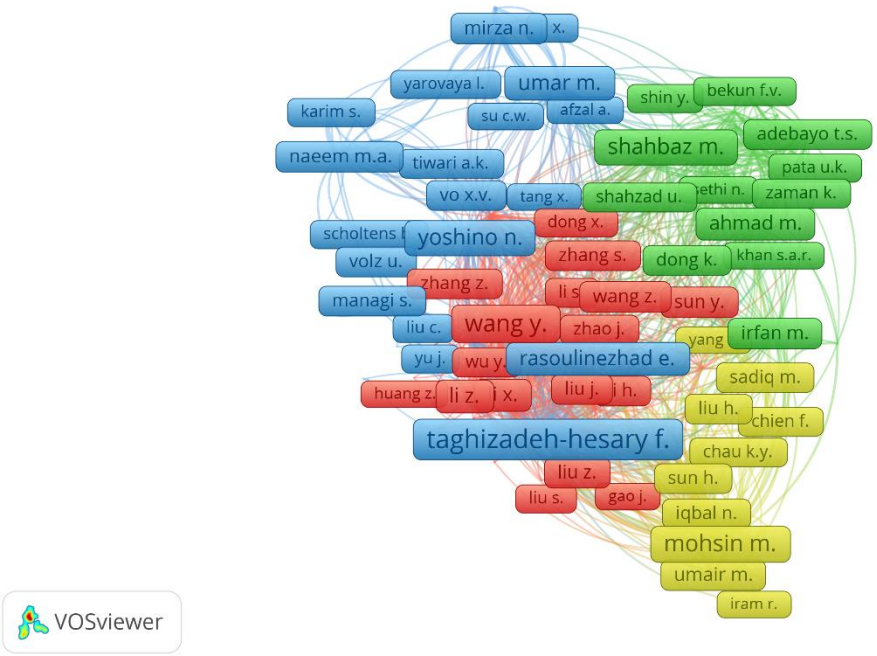

Figure 8. Author Collaboration Visualization
Source: Data Analysis, 2024

This co-authorship network visualization highlights the relationships among prominent authors in the field of green finance and sustainable investments. Distinct clusters, represented by different colors, indicate groups of authors who frequently collaborate. The red cluster, dominated by authors like Wang Y. and Taghizadeh-Hesary F., reflects a highly interconnected network of researchers focusing on key themes within the field. Similarly, the blue cluster, featuring Yoshino N. and Umar M., suggests another strong collaboration circle, potentially centered on specific subtopics like policy frameworks or economic impacts. The green cluster, led by Shahbaz M. and Mohsin M., indicates contributions likely tied to environmental economics and energy transition. The connections between clusters reflect cross-collaboration among these groups, emphasizing the interdisciplinary and global nature of the research. The visualization underscores key influencers in the domain and highlights opportunities for expanding collaborations across clusters to bridge research gaps.

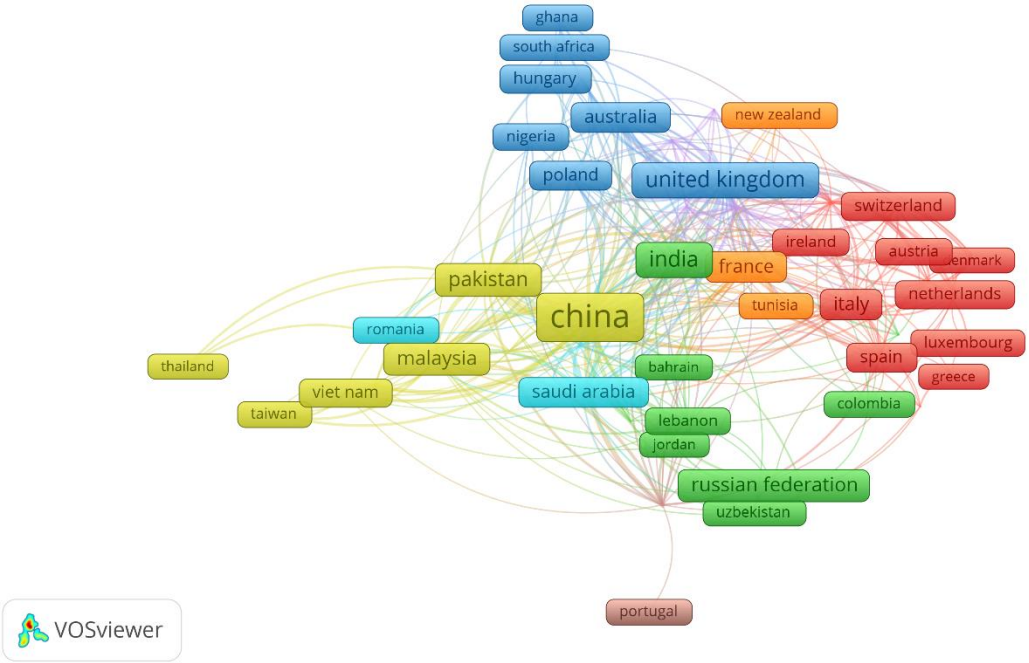

Figure 9. Country Collaboration Visualization
Source: Data Analysis, 2024

This visualization depicts the collaboration network among countries in research related to green finance and sustainable investments. China emerges as the central node with the highest degree of collaboration, connecting strongly to countries such as India, the United Kingdom, and the Russian Federation, indicating its leadership in this research domain. Other significant hubs include the United Kingdom and India, which form important bridges connecting Europe, Asia, and beyond. Distinct clusters, such as the red cluster comprising European countries like Italy, Switzerland, and the Netherlands, highlight regional collaboration within Europe. Similarly, the blue cluster groups countries like Australia, Nigeria, and South Africa, showcasing international partnerships outside of Europe and Asia. Smaller nodes like Colombia, Thailand, and Portugal suggest emerging contributors with growing participation in the global discourse. The visualization emphasizes the global nature of research in green finance while highlighting opportunities to strengthen collaboration with underrepresented regions.

Discussion

1. Key Insights from Bibliometric Analysis

The bibliometric analysis reveals significant insights into the evolving research landscape of green finance and sustainable investment strategies. A key finding is the prominence of interconnected themes such as "sustainability," "investments," and "green economy," which underscores the centrality of these concepts in academic discourse. The dense connections between these themes and other topics, such as "renewable energies" and "energy efficiency," suggest that the integration of financial strategies with sustainability and energy transitions remains a primary focus of research. This aligns with global priorities such as achieving the United Nations Sustainable Development Goals (SDGs) and addressing climate change through financial innovations.

Additionally, the temporal analysis highlights a shift toward more technology-driven topics in recent years, such as "green technology innovation" and "decentralized finance." This suggests that the research community is increasingly exploring the role

of advanced technologies like blockchain and fintech in promoting transparency and efficiency in green financial systems. Such innovations have the potential to address long-standing barriers in green finance, including transparency, data availability, and scalability.

2. Geographical Distribution and Collaboration

The co-authorship and country collaboration analysis highlights China's leading role in research on green finance and sustainable investments, both in terms of volume and collaboration. As the largest emitter of greenhouse gases and a major global economy, China's emphasis on green finance reflects its commitment to balancing economic growth with environmental sustainability. Strong links between China and countries like India, the United Kingdom, and the Russian Federation further indicate a collaborative approach to addressing global sustainability challenges. European countries such as Italy, the Netherlands, and Switzerland also play significant roles in green finance research, with a distinct focus on policy frameworks and implementation strategies. The clustering of European nations in the network suggests a regional emphasis on collaborative policymaking and the development of standardized frameworks, such as the EU Green Taxonomy. Meanwhile, emerging economies such as Pakistan, Malaysia, and Saudi Arabia are also gaining traction, reflecting the increasing globalization of research in this field. However, regions like Africa and South America are less represented, indicating opportunities for greater inclusion and collaboration to address region-specific sustainability challenges.

3. Emerging Themes and Future Research Directions

The network visualization highlights several emerging themes that warrant further exploration. Topics such as "green technology innovation" and "decentralized finance" represent the intersection of technology and sustainability, offering new avenues for enhancing the effectiveness of green finance. Blockchain technology, for example, can improve transparency in green bond markets, while decentralized finance (DeFi) can democratize access to sustainable investments. Future research could focus on evaluating the practical applications of these technologies and their potential to scale green financial systems globally. Another emerging theme is the integration of geopolitical risks into green finance strategies. As climate change increasingly intersects with global political dynamics, understanding the implications of geopolitical instability on sustainable investments becomes crucial. For instance, how do conflicts and trade policies affect the flow of green investments across borders? Addressing such questions can provide valuable insights for policymakers and investors navigating the complexities of global finance.

5. Challenges and Barriers

Despite the growing interest in green finance and sustainable investments, several challenges persist. One major issue is the lack of standardized reporting frameworks for ESG criteria. While tools like the EU Green Taxonomy provide some guidance, variations across regions and sectors create inconsistencies that hinder comparability and decision-making (European Commission, 2020). For instance, what qualifies as a "green" investment in one region may not meet the criteria in another, leading to confusion and inefficiencies in global markets. Another barrier is the perception of higher financial risks associated with green investments. Although research has demonstrated the long-term financial benefits of ESG-aligned portfolios [10], skepticism among traditional investors remains. This is particularly true in emerging markets, where underdeveloped financial systems and limited access to data exacerbate these concerns. Addressing these challenges requires collaborative efforts between governments, financial institutions, and researchers to develop risk assessment tools

and market incentives that can reduce perceived risks and promote confidence in green finance.

6. Practical Implications

The findings from this study have several practical implications for stakeholders in green finance and sustainable investments. For policymakers, the results highlight the need for harmonized global standards that can facilitate cross-border investments and enhance the credibility of ESG reporting. The establishment of universally accepted criteria for green bonds, for instance, can attract more investors and scale the impact of green finance initiatives. For financial institutions, the growing focus on technology-driven themes underscores the importance of investing in digital tools that can enhance transparency and efficiency. Adopting blockchain-based solutions for tracking the environmental impact of investments or using artificial intelligence to assess ESG performance are examples of how technology can be leveraged to advance sustainability goals. Lastly, for researchers, the gaps identified in regions like Africa and South America point to opportunities for conducting localized studies that address region-specific challenges. Exploring the unique barriers and opportunities in these regions can enrich the global discourse on green finance and ensure a more inclusive approach to sustainability.

7. Contribution to the Literature

This study contributes to the literature by providing a comprehensive bibliometric analysis of green finance and sustainable investment strategies. By mapping the thematic, geographical, and temporal trends in this field, it offers valuable insights into the evolution and current state of research. The identification of emerging themes such as green technology innovation and geopolitical risks adds to the understanding of the dynamic nature of green finance. Moreover, the findings highlight the need for greater collaboration and standardization to overcome existing barriers and scale the impact of sustainable investments.

8. Limitations of the Study

While this study provides a broad overview of research trends, it has certain limitations. The reliance on a single database (Scopus) may exclude relevant publications indexed in other databases such as Web of Science or Google Scholar. Additionally, the focus on bibliometric analysis limits the ability to explore qualitative aspects of the research, such as the contextual nuances of policy implementations or stakeholder perspectives. Future studies could address these limitations by incorporating multiple databases and employing mixed-method approaches to gain a more holistic understanding of the field.

5. CONCLUSION

The bibliometric analysis underscores the critical role of green finance and sustainable investments in addressing global sustainability challenges. While significant progress has been made, particularly in areas like ESG integration and technology adoption, challenges such as the lack of standardized frameworks and perceived risks persist. By fostering greater collaboration, leveraging technological innovations, and addressing region-specific barriers, stakeholders can unlock the full potential of green finance as a catalyst for sustainable development. This study serves as a foundation for future research and practical initiatives aimed at advancing the global sustainability agenda.

REFERENCES

[1] A. Al-Roubaie and A. M. Sarea, "Green investment and sustainable development: The case of Islamic finance," *J. Islam. Bus. Manag.*, vol. 9, no. 1, 2019.

[2] H. Canton, "United nations conference on trade and development—unctad," in *The Europa directory of international organizations 2021*, Routledge, 2021, pp. 172–176.

[3] B. Kumar, L. Kumar, A. Kumar, R. Kumari, U. Tagar, and C. Sassanelli, "Green finance in circular economy: a literature review," *Environ. Dev. Sustain.*, pp. 1–41, 2023.

[4] A. Sekreter, "Green finance and Islamic finance," *Int. J. Soc. Sci. Educ. Stud.*, vol. 4, no. 3, pp. 115–121, 2017.

[5] A. A. Pramisti and D. F. Istiqomah, "THE INFLUENCE OF ENVIRONMENTAL SOCIAL GOVERNANCE (ESG) ON COMPANY VALUE WITH FINANCIAL PERFORMANCE AS A MEDIATION VARIABLE," *J. Apl. Akunt.*, vol. 9, no. 1, pp. 34–45, 2024.

[6] N. Krissanya, S. Sholikhah, M. B. Berutu, and D. A. P. Sari, "Exploring the role of green brand positioning in determining green product purchase intention," *Int. J. Appl. Econ. Financ. Account.*, vol. 15, no. 2, pp. 88–95, 2023.

[7] M. Aria and C. Cuccurullo, "A brief introduction to bibliometrix," *J. Informetr.*, vol. 11, no. 4, pp. 959–975, 2017.

[8] A. S. Rusydiana, R. Sukmana, N. Laila, and M. S. Bahri, "The nexus between a green economy and islamic finance: Insights from a bibliometric analysis," *Islam Civilisational Renew.*, vol. 13, no. 1, pp. 51–71, 2022.

[9] S. Naumann, M. Davis, T. Kaphengst, M. Pieterse, and M. Rayment, "Design, implementation and cost elements of Green Infrastructure projects," *Final report, Eur. Comm. Brussels*, vol. 138, 2011.

[10] G. Friede, T. Busch, and A. Bassen, "ESG and financial performance: aggregated evidence from more than 2000 empirical studies," *J. Sustain. Financ. Invest.*, vol. 5, no. 4, pp. 210–233, 2015.

[11] P. Weston and M. Nnadi, "Evaluation of strategic and financial variables of corporate sustainability and ESG policies on corporate finance performance," *J. Sustain. Financ. Invest.*, vol. 13, no. 2, pp. 1058–1074, 2023.

[12] A. Ahamat, "Is Islamic banking and finance doing enough? Shaping the sustainable and socially responsible investment community," *Asian Soc. Sci.*, vol. 13, no. 3, p. 170, 2017.

[13] F. A. F. de S. Cunha, E. Meira, and R. J. Orsato, "Sustainable finance and investment: Review and research agenda," *Bus. Strateg. Environ.*, vol. 30, no. 8, pp. 3821–3838, 2021.

[14] M. Piratti and V. Cattelan, "Islamic green finance: A new path to environmental protection and sustainable development," in *Islamic social finance*, Routledge, 2018, pp. 144–172.

[15] P. J. Berto, D. Ferraz, and D. A. do N. Rebelatto, "The circular economy, bioeconomy, and green investments: a systematic review of the literature.," 2022.

[16] K. Saher and Q. Siddique, "The Impact of Corporate Social Responsibility (CSR) and Green Investments on Sustainable Performance: The Mediating Role of Firm Financial Performance," *J. Glob. Econ. Rev*, vol. 3, pp. 59–73, 2023.

[17] H. Diwan and B. Amarayil Sreeraman, "From financial reporting to ESG reporting: a bibliometric analysis of the evolution in corporate sustainability disclosures," *Environ. Dev. Sustain.*, pp. 1–37, 2023.

[18] S. Hamidah and R. Dewantara, "The Alignment of Social, Economic and Environmental Aspects in Sustainable Finance of Islamic Green Banking," in *Brawijaya International Conference (BIC 2022)*, Atlantis Press, 2023, pp. 199–214.

[19] N. N. Utami, "Bibliometric Analysis of Green Economy Learning for Children (1996-2023): Current Status and Future Directions," *QALAMUNA J. Pendidikan, Sos. dan Agama*, vol. 15, no. 1, pp. 655–666, 2023.

[20] F. Taghizadeh-Hesary and N. Yoshino, "The way to induce private participation in green finance and investment," *Financ. Res. Lett.*, vol. 31, pp. 98–103, 2019.

[21] M. Irfan, A. Razzaq, A. Sharif, and X. Yang, "Influence mechanism between green finance and green innovation: exploring regional policy intervention effects in China," *Technol. Forecast. Soc. Change*, vol. 182, p. 121882, 2022.

[22] E. Campiglio, "Beyond carbon pricing: The role of banking and monetary policy in financing the transition to a low-carbon economy," *Ecol. Econ.*, vol. 121, pp. 220–230, 2016.

[23] S. Zhang, Z. Wu, Y. Wang, and Y. Hao, "Fostering green development with green finance: An empirical study on the environmental effect of green credit policy in China," *J. Environ. Manage.*, vol. 296, p. 113159, 2021.

[24] E. Rasoulinezhad and F. Taghizadeh-Hesary, "Role of green finance in improving energy efficiency and renewable energy development," *Energy Effic.*, vol. 15, no. 2, p. 14, 2022.

[25] C. Li and M. Umair, "Does green finance development goals affects renewable energy in China," *Renew. Energy*, vol. 203, pp. 898–905, 2023.

[26] F. Taghizadeh-Hesary and N. Yoshino, "Sustainable solutions for green financing and investment in renewable energy projects," *Energies*, vol. 13, no. 4, p. 788, 2020.

[27] G. Gianfrate and M. Peri, "The green advantage: Exploring the convenience of issuing green bonds," *J. Clean. Prod.*, vol. 219, pp. 127–135, 2019.

[28] M. Madaleno, E. Dogan, and D. Taskin, "A step forward on sustainability: The nexus of environmental responsibility, green technology, clean energy and green finance," *Energy Econ.*, vol. 109, p. 105945, 2022.

[29] I. Akomea-Frimpong, D. Adeabah, D. Ofosu, and E. J. Tenakwah, "A review of studies on green finance of banks, research gaps and future directions," *J. Sustain. Financ. Invest.*, vol. 12, no. 4, pp. 1241–1264, 2022.