

Green Finance and its Role in Achieving Sustainable Development Goals: A Bibliometric Analysis

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Green finance serves as an essential part of guiding the world towards sustainable development through integrating financial investments with environmental benefits. This research aims to perform a bibliometric analysis to investigate the academic progression of research on green finance and its role in achieving sustainable development goals. A comprehensive analysis of 494 research articles published within the last decade and extracted from the Scopus database is conducted using Biblioshiny and VOSviewer software. This study examines the publication trend, the contributions of various countries, the leading journals for publication, the most significant articles, the most frequently used keywords, and influential authors based on their citations. The findings show that green finance contributes significantly to the attainment of 4 out of 17 sustainable development goals (SDGs): affordable and clean energy (SDG 7), industry, innovation, and infrastructure (SDG 9), sustainable cities and communities (SDG 11), and climate action (SDG 13).

Keywords: Green finance, Sustainable Finance, Bibliometric analysis, sustainable development, renewable energy, sustainability.

1. Introduction

IN the fast-changing global environment, the need for sustainable development and the pressing necessity to address climate change are crucial (Radu *et al.* 2013). Sustainability is a normative notion that guides human interactions with

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the environment and emphasizes accountability for safeguarding it for future generations (Bekuma *et al.*, 2023). The pursuit of sustainable development is crucial for attaining the intended future results (Rahman *et al.*, 2023). The Brundtland Report of the UN World Commission on Environment and Development explains sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Cassotta & Sidortsov, 2019). The last ten years have seen a rise in the significance of green finance tools because of their applicability in national and international accords to address the climate catastrophe (Maria *et al.*, 2023). Green finance focuses on eco-friendly investments and practices, playing a crucial role in reaching carbon neutrality and promoting sustainable economic development (Bhatnagar *et al.*, 2022; Hafner *et al.*, 2020). It encompasses a range of financial instruments and investments in sustainable initiatives, including green bonds and green insurance, and leverages technology such as blockchain for efficient monitoring and transparency (Kaur & Aadheesh, 2023), in line with the United Nations’ Sustainable Development Goals (SDGs) (Verma & Bahet, 2023; Sengupta & Patil, 2023). A global consensus has been achieved regarding the concept of a low-carbon economy, which is distinguished by its negligible energy consumption and emissions (Nassami *et al.*, 2017). Governments are implementing economic measures to encourage the shift to a low-carbon society through adaptation and mitigation initiatives. China has made notable advancements in building green finance, including the development of green financial instruments like green bonds and credits (Li *et al.*, 2023). Green financing policies have had a beneficial impact on low-carbon economic growth, particularly in pilot regions. Green finance may help mitigate environmental pollution and climate change, encourage the use of renewable energy, and decrease CO₂ emissions.

Green finance is an important instrument for managing environmental, social, and governance risks, especially in the context of climate change. It enhances the company’s Green Total Factor Productivity (GTFP) by encouraging energy saving and emission reduction (Su & Cheng, 2023). It can offer financial assistance for local scientific and technological innovation and upgrade energy consumption structure, finally leading to sustainable economic growth. Research has demonstrated that it positively impacts renewable energy production in addition to variables like environmental taxation, income, urbanization, and waste management (Xia *et al.*, 2023). Implementing green financial reform strategies has been shown to speed up firm development, decrease financing obstacles, boost government subsidies, and enhance corporate social responsibility (Yu *et al.*, 2023). It negatively correlates with greenhouse gas emissions, indicating its ability to help mitigate climate change (Elsherif, 2023; Sadiq *et al.*, 2024). The advancement of green finance facilitates a shift towards sustainable social and economic expansion, focusing on the equal and

synchronized advancement of economic activity, environmental conservation, and mitigating climate change hazards (Wang *et al.*, 2022). However, there are several obstacles to overcome, such as knowledge asymmetry in green finance, ambiguous definitions, lack of a unified green finance system, lack of cooperation amongst legislators, contradictory laws, and a lack of financial institutions and investors' incentives (Ozili, 2022; Bansal *et al.*, 2023).

Given the urgent need for sustainable development in areas like climate change, ecological degradation, and financial crisis, green finance, and sustainable development require more emphasis and attention. The present study intends to thoroughly investigate the existing state and emerging trends in worldwide research on green finance and sustainable development using bibliometric analysis. The bibliometric analysis has seen a significant rise in utilization due to its effectiveness in managing enormous amounts of scientific data and substantial research impact (Donthu *et al.*, 2021). It is crucial as it quantitatively assesses the impact and quality of research publications by analyzing citation patterns, identifying influential authors, and important research articles, and mapping research trends and collaborations. This study aims to analyze research articles extracted from the Scopus database using bibliometric approaches using Biblioshiny and VOSviewer software.

The structure of the current paper is as follows: In Section 2, the literature review is presented. In Section 3, the methodology is described. The unit of analysis is described in Section 4, and the subsequent section is devoted to the findings. The concluding segment delineates the policy implications and provides the conclusion.

2. Literature Review

Transforming our World: The 2030 Agenda for Sustainable Development, a global plan unveiled by the United Nations in September 2015, outlined a series of initiatives to tackle the pressing issues of poverty and environmental degradation on a global scale by the year 2030 (UNGA 2015). This agenda is a non-binding accord that grants governments the autonomy to devise national policies and develop development objectives in alignment with the Sustainable Development Goals (Allen *et al.* 2019). According to Zhou *et al.* (2021), environmental sustainability, social progress, resources, and economic progress are the three systems that constitute sustainable development. Transitioning to more sustainable economies necessitates substantial investments from both commercial and public sectors (Long & Blok, 2021). Green finance, also known as sustainable finance, tends to exist at the nexus of environmental preservation and economic growth. Green finance as defined by the G20 green financing research, refers to the financial investments that seek to deliver environmental benefits within the framework of attaining ecologically sustainable development

(Long & Blok, 2021). The Handbook of Green Finance defines the word as “innovative financial instruments and policies related to environmental sustainability, such as green bonds, green banks, carbon market instruments, fiscal policy, green central banking, fintech, and community-based green funds” (Sachs *et al.* 2019). The arena involves stakeholders including producers, consumers, investors, and governments at different levels (Demirel & Danisman, 2019). The implementation of green bonds in a rational manner could prevent the release of 4.7 Gt of carbon dioxide emissions by 2030. Furthermore, the authors predict that the advancement of green finance will increase the share of non-fossil energy generation from 42% to 46% (Glomsrød & Wei, 2018).

Since the Paris Agreement of 2015, green finance has been more popular as a crucial tool in addressing the challenges arising from environmental degradation and climate change. Countries have started enacting legislation and implementing adaptation and mitigation policies to combat climate change (Muchiri *et al.*, 2022). While financial innovation has significant effects on various aspects of society, its impact on the ecological environment is minimal. There is great potential to enhance the ecological environment through the allocation of financial resources (Galaz *et al.*, 2015; Scholtens, 2017). Green finance is a financial tool that supports enterprises or initiatives benefiting both the economy and the environment, thereby promoting sustainable development. It plays a vital role in fostering fair, robust, and greener economic growth by producing environmental benefits. It helps to increase financial resources from government, business, and non-profit sectors for sustainable development goals (Jha and Bakhshi, 2019). Green finance encourages proactive, eco-friendly actions including boosting public transit producing renewable energy and recycling discarded items (Nugent, 2015). On the other side, it aims to prevent the expansion of any business or activity that might harm the natural environment (Scarpellini *et al.*, 2018).

Several studies have explored the field of green finance using bibliometric analysis. Zhang (2019), using 381 Publications obtained from the Web of Science database, provided a concise current development in green finance research. Wang *et al.* (2021) reviewed 815 papers from the Web of Science database spanning from 2008 to 2020 and delved into the implications of green finance literature on energy policy. Muchiri (2022) analyzed the trend and present state of green funding research following the Paris Agreement. Zhang (2022) adopted this methodology to summarise studies on green financing and carbon emission reduction, using literature published since 2010. Similarly, Tao (2023) explored a worldwide analysis in the realm of green finance and energy to gain a thorough comprehension and Maria (2023) presented a technique for identifying possible thematic connections between academic papers in the field of green finance. Previous studies have mostly focused on analyzing research publications about

the present status of green finance, particularly emphasizing its development and its connection to carbon emission reduction. However, they have not examined the aspect of sustainable development within bibliometric analysis, creating a gap in the research. Azad *et al.* (2022) emphasize the need to reassess the existing state of green finance. The present paper tries to expand the scope by including larger sustainability aspects, providing a more detailed view of bibliometrics in green finance.

3. Methodology

This research study employs bibliometric analysis methodology using VOSviewer and Biblioshiny software to scrutinize previous research articles related to green finance and sustainable development. The search was conducted using the Scopus search engine, covering the period from 2014 to 2024. Since the 2015 Paris Agreement was signed, there has been a significant increase in the momentum for green financing. A wide range of initiatives have shown promise, including investors moving away from coal and ambitious corporate emissions reduction objectives, as well as a growing movement of young activists from Uganda to India and a spike in support for net-zero ambitions (Bergen & Mountford, 2020). Six nations – Denmark, France, Hungary, New Zealand, Sweden, and the UK – have made their commitment to achieve net-zero carbon emissions legally obligatory. More than 100 nations have already committed to meeting these targets. Keeping this in mind, the dataset from 2014 to 2024 has been selected because the ten-year period allows for a comprehensive analysis of trends and patterns. This timeframe includes the most recent data available, ensuring that our findings are up-to-date and relevant to the current situation. Hence, this enhances the study's relevance and applicability. Scopus is a widely used academic database that offers top journal articles, references, and publishing information for research and development. The search terms included "green finance," "sustainable finance," "sustainable development," "sustainability," and "SDGs" resulting in 1363 articles. After that research articles were filtered based on subject areas including 'Business, management and accounting,' 'Economics, econometrics, and finance,' 'Social sciences,' 'Arts and Humanities,' 'Decision sciences,' 'Agricultural and biological science,' 'Earth and planetary Sciences,' 'energy', and 'environmental science'. This refinement process led to 1290 accepted articles and the rejection of 73 research articles. Research articles of the final publication stage were considered further resulting in 867 accepted research articles. To ensure uniformity, only articles in the English language were included, resulting in 840 accepted articles and 27 rejections. At last, content screening was conducted to include those articles where titles, abstracts, and keywords indicated relevance to the scope of the study. This step yielded 494 accepted

articles, with 346 articles rejected as shown in Table 1. This meticulous selection process ensured that bibliometric analysis was based on a comprehensive and relevant dataset to provide meaningful insights into the landscape of research on green finance and sustainable development within the specified parameters.

TABLE 1
ARTICLE SELECTION PROCESS

| Filtering Criteria | Accept | Reject |
|--|--------|--------|
| Search Criteria Search engine: Scopus (2014-2024) | | |
| Search term: "Green finance" OR "Sustainable finance" AND "Sustainable development" OR " Sustainability" OR "SDGs" | 1363 | |
| Subject area: "Business, management and accounting", "Economics, econometrics and finance", "Social sciences", and "Arts and humanities", "Decision sciences", "Agricultural and biological science", "Earth and planetary sciences", "Energy" "Environmental science" | 1290 | 73 |
| Document type: "Research Articles" | 941 | 349 |
| Publication stage: "Final" | 867 | 74 |
| Language screening: Include English documents only | 840 | 27 |
| Content screening: Include articles if "Titles, abstracts, and keywords" indicate relevance to the scope of study only | 494 | 346 |

4. Unit of Analysis

The study concentrates on a comprehensive analysis of different aspects within the fields of green finance and sustainable development. The study explores publication trends, countries' contributions, leading journals, most significant articles, co-authorship patterns, influential authors, and common keywords based on both total citations and total publications.

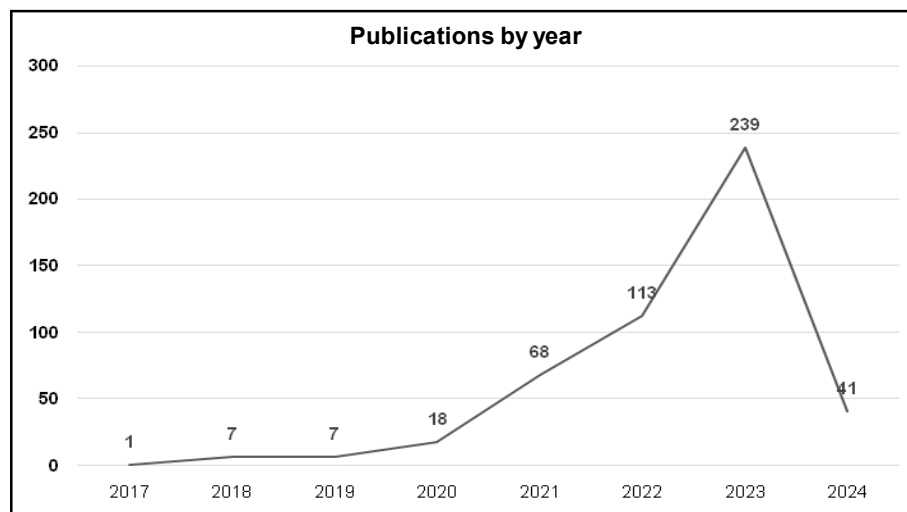
The study uses bibliographical information to perform detailed calculations and gain insights. The research aims to analyze key aspects of green finance and sustainable development to provide insights into the evolution, contributors, and impactful elements.

4.1 Publication Trend Analysis

Examining the evolution of research in green finance and sustainable development using Figure 1 shows a significant increase over time. The figure shows a rising trend, revealing that a substantial number of academic works

were published after 2021, particularly after the worldwide COVID-19 outbreak. The visualization clearly shows a growing focus on the intersection of green finance and sustainable development. This also indicates the expectation of more significant contributions in the future.

FIGURE 1
TREND ANALYSIS



4.2 Leading Publication Countries

Table 2 reflects the publishing activity of the top countries in the field of green finance and sustainable development. In terms of citations and publications, China occupies the highest position with a maximum count of 281 publications and 5847 total citations. Followed by Pakistan with 48 documents and 1602 total citations. These two countries cover 66 per cent of the total publications of the database. This analysis highlights the significant and impactful contributions of developing countries in the fields of green finance and its role in achieving sustainable development goals. The results also show that India lacks research in the field of green finance and sustainability. This issue can be attributed to several factors, including the relatively nascent stage of green finance initiatives and sustainability policies in India compared to other emerging markets (Ranjan, A., 2021). Additionally, there is a general lack of awareness and understanding of green finance among stakeholders, including policy-makers, businesses, and the general public (Osama & Fatma, 2023). Furthermore, the financial sector has traditionally prioritized economic growth over environmental concerns, leading to slower adoption of green finance practices in India (Sharma & Choubey, 2022).

TABLE 2
CONTRIBUTION OF DIFFERENT COUNTRIES ALONG WITH THE NUMBER OF ARTICLES AND TOTAL CITATIONS

| Country | Total Documents | Total Citations |
|----------------|-----------------|-----------------|
| China | 281 | 5847 |
| Pakistan | 48 | 1602 |
| Japan | 15 | 1207 |
| Malaysia | 31 | 1018 |
| United Kingdom | 37 | 884 |
| United States | 19 | 654 |
| Australia | 20 | 607 |
| Italy | 19 | 449 |
| Singapore | 5 | 449 |

4.3 Most Prominent Journal

Table 3 displays the top journals in the field of green finance based on citations and number of publications, along with their impact on sustainable development. This analysis is crucial for choosing top-tier journals to conduct a literature review. In terms of citations representing the journal's influence, the most productive journal is "Renewable Energy" having 905 total citations out of 152 sources. However, in terms of publications, the most significant journal is "Environmental Science and Pollution Research" with 57 total publications.

TABLE 3
TOPMOST JOURNALS BASED ON CITATIONS ALONG WITH TOTAL DOCUMENTS

| Source | Total Documents | Total Citations |
|--|-----------------|-----------------|
| Renewable Energy | 32 | 905 |
| Sustainability (Switzerland) | 52 | 884 |
| Resources Policy | 46 | 883 |
| Journal of Cleaner Production | 12 | 626 |
| Environmental Science and Pollution Research | 57 | 611 |
| Journal of Environmental Management | 9 | 498 |

4.4 Most Influential Author (Co-authorship Network)

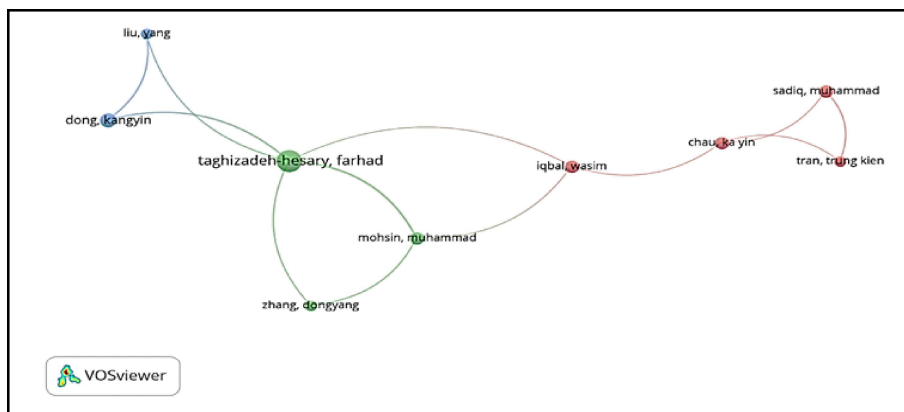
Table 4 shows the list of highly cited authors out of 1374 authors from different organizations in this field. In terms of citations and total documents,

Taghizadeh-hesary & Farhad were the most influential and impactful authors with 1044 citations and 12 documents. Furthermore, Figure 2 explores the complex network of collaboration among authors who have more than three documents. The co-authorship network analysis illustrates 9 nodes representing authors and 12 links representing their co-author relationships. This visual representation indicates that there is a collaboration among the authors. Taghizadeh-hesary & Farhad stands out as the most collaborative author, establishing connections through 5 links. This analysis not only sheds light on the individual impact but emphasizes on collaborative nature that propels progress in this field.

TABLE 4
TOP CONTRIBUTING AUTHORS IN THIS FIELD BASED ON CITATIONS
ALONG WITH TOTAL DOCUMENTS

| Authors | Total Documents | Total Citations |
|---------------------------|-----------------|-----------------|
| Taghizadeh-hesary, Farhad | 12 | 1044 |
| Mohsin, Muhammad | 4 | 670 |
| Najam, Hina | 4 | 300 |
| Sadiq, Muhammad | 4 | 186 |
| Umar, Muhammad | 5 | 159 |
| Chau, Ka yin | 4 | 142 |
| Siddik, Abu bakkar | 5 | 140 |
| Iqbal, Wasim | 4 | 121 |
| Dong, Kangyin | 5 | 82 |

FIGURE 2
CO-AUTHORSHIP NETWORK ANALYSIS



4.5 Most Significant and Cited Article

Table 5 showcases the most influential articles by total citations, with Zhang's (2021) "Public spending and green economic growth in BRI region: Mediating role of green finance" having the highest number of citations (433) in Scopus. Following by Flammer's (2021) "Corporate Green" (2000) is placed second with 413 total citations. Additionally, another contribution by Zhang (2021) made a significant contribution by investigating the environmental impacts of green credit policy in China in the research article titled "Fostering Green Development with Green Finance: An Empirical Study on the Environmental Effect of Green Credit Policy in China."

TABLE 5

MOST IMPORTANT RESEARCH ARTICLES IN THIS FIELD BASED ON CITATIONS

| Research Article | Author & Year | Total Citations |
|--|----------------------|-----------------|
| Public Spending and Green Economic Growth in BRI Region: Mediating Role of Green Finance | Zhang (2021) | 433 |
| Corporate Green Bonds | Flammer (2021) | 413 |
| Fostering Green Development with Green Finance: An Empirical Study on the Environmental Effect of Green Credit Policy in China | Zhang (2021) | 245 |
| Role of Green Finance in Improving Energy Efficiency and Renewable Energy Development | Rasoulinezhad (2022) | 221 |
| Does Green Finance Development Goals Affect Renewable Energy in China | Li (2023) | 181 |
| Central Bank Mandates, Sustainability Objectives and the Promotion of Green Finance | Dikau (2021) | 175 |

4.6 Keywords Co-occurrence Analysis

Table 6 displays the most popular keywords related to this research field. This analysis is crucial for pinpointing the primary research areas in this field. The prominent keyword in this field is "green finance," which appears 297 times, highlighting its central role. The term "sustainable development" is 258 times used in articles, indicating its importance in this area. Moreover, the inclusion of "China" as a keyword (174 times), highlights the geographical emphasis on the research related to green finance in the Chinese context.

Additionally, “finance” (155 frequency) and “sustainability” (148 frequency) contribute to the multifaceted dimensions explored in this research field.

TABLE 6
TOP KEYWORDS BASED ON THEIR OCCURRENCES

| Keywords | Occurrences | Keywords | Occurrences |
|-------------------------|-------------|------------------------------|-------------|
| Green Finance | 297 | Environmental Economics | 75 |
| Sustainable Development | 258 | Economic Growth | 65 |
| China | 174 | Carbon Emission | 60 |
| Finance | 155 | Innovation | 56 |
| Sustainability | 148 | Climate Change | 55 |
| Green Economy | 122 | Investment | 55 |
| Economic Development | 95 | Carbon Dioxide | 51 |
| Investments | 93 | Renewable Energy | 51 |
| Sustainable Finance | 89 | Sustainable Development Goal | 42 |
| Alternative Energy | 78 | Environmental Protection | 41 |

Figure 3 displayed a co-occurrence network visualization of keywords that occurred at least thirty-five times. The network consists of 25 items and 299 links. The network was segmented into three clusters. The connection between the items in the clusters can be understood by analyzing the distance between them (Goyal & Kumar, 2020).

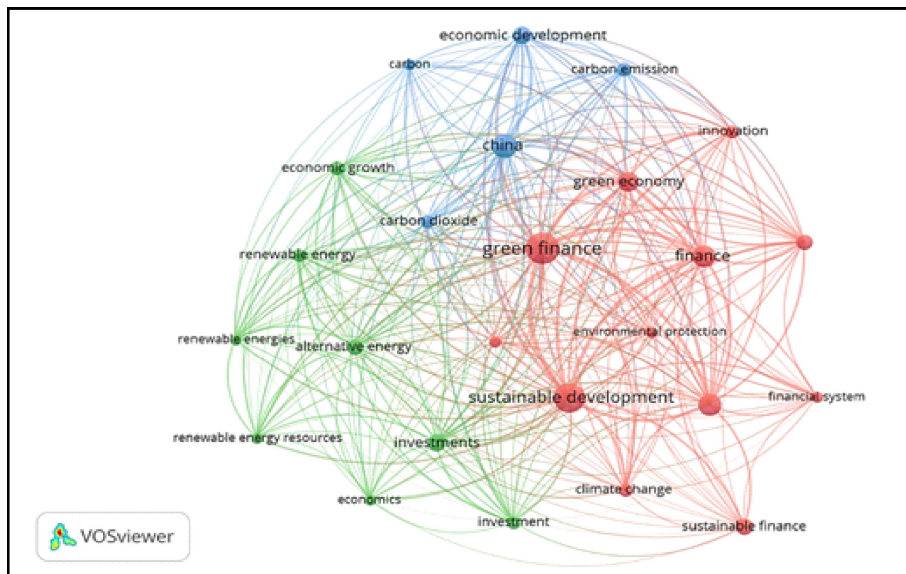
Cluster 1: The largest cluster is ‘*Sustainable Development*’ which has 12 items. This cluster of research examines the significance of green finance in the context of sustainable development. Green finance is intricately linked to the broader concept of sustainable development, which considers environmental preservation in addition to economic and social progress as the primary concern (Agirman & Osman, 2019). The financial sector, which includes consumer finance firms, stock brokerages, banks, and insurance companies, acknowledges the importance of green banking in achieving sustainable development (Kavitha & Rani, 2016). Moreover, the implementation of green finance policies could help in the prevention of environmental degradation (Afzal *et al.*, 2022).

Cluster 2: The second largest cluster is named “*Renewable Energy*” and includes 8 members. This cluster focuses on the role of green finance in supporting renewable energy projects. Studies have shown that green finance

contributes to green growth by supporting renewable energy consumption and power generation from renewable and waste sources (Hasan & Hossain, 2022). Advancing renewable energy and addressing climate change are crucial for reducing carbon emissions (Bughio *et al.*, 2023). Moreover, the utilization of green finance plays a crucial role in the increasing adoption of renewable energy in China (Bughio *et al.* 2023). Research has shown an interactive spillover effect between green bonds and renewable energy stocks (Zhang & Umar, 2023). In addition, green finance and innovation are valuable tools for improving environmental safety and advancing the growth of renewable energy sources (Ben Belgacem *et al.* 2023).

Cluster 3: The third cluster is titled “Economic Development” which has five members. Research has shown that green finance is positively correlated with economic growth (Behera *et al.*, 2023). It contributes to the increase of the green total factor productivity (GTFP), demonstrating the achievement of economic and environmental sustainability (Xu & Zhao, 2023). Green entrepreneurship is associated with financial development, credit policy, and sustainable development goals that help in decreasing pollution and fostering economic growth. Green bonds support the shift to renewable energy while keeping with sustainable development goals, ultimately driving economic growth. Green finance policies promote low-carbon economic development by fostering scientific innovation and improving energy consumption structures to support sustainable economic growth (Yao *et al.*, 2023).

FIGURE 3
CO-OCCURRENCE ANALYSIS OF KEYWORDS WITH A MINIMUM OF THIRTY-FIVE OCCURRENCES



5. Findings

The Sustainable Development Goals (SDGs) are a set of 17 worldwide objectives established by the United Nations General Assembly to guide actions until 2030. The 17 Sustainable Development Goals (SDGs) serve as a pressing appeal for both developing and wealthy nations to take action, offering a detailed strategy for achieving peace and prosperity for both people and the planet (Sustainability and ESG Solutions, 2020). Green finance or sustainable finance is essential for advancing sustainable development goals through the allocation of financial resources towards environmentally sustainable initiatives (Rasoulinezhad, 2022). According to the UN Environment Programme, sustainable financing aims to augment the volume of financial inflows and outflows from the public, private, and not-for-profit sectors towards priorities related to sustainable development (UNEP, 2023). By prioritizing investments in renewable energy, sustainable infrastructure, and climate resilience projects, banks can reduce their carbon footprint and support the goals of the COP 26 United Nations Climate Change Conference (Boubaker & Le, 2024). Furthermore, green finance promotes the creation of technologically advanced solutions (Ma & Chang, 2023) that are environmentally friendly, energy-efficient, and free from radiation, thereby promoting environmental responsibility (Baloch *et al.*, 2023). Overall, it promotes the concurrent attainment of economic, social, and environmental sustainability objectives and significantly contributes to Sustainable Development Goals (Zhang & Wang, 2021) as explained below:

| SDGs | Role of Green Finance in Achieving SDGs | References |
|--|---|--|
| Affordable and Clean Energy (SDG 7) | Green finance offers financial resources and assistance for renewable energy initiatives like green banks & sustainable investment funds, that help in increasing the accessibility and affordability of clean energy. | Sharif <i>et al.</i> (2024); Li <i>et al.</i> (2022); Zhang <i>et al.</i> (2022); Zhou & Li (2022); Rasoulinezhad (2022) |
| Industry, Innovation, and Infrastructure (SDG 9) | Green finance promotes investment in sustainable infrastructure and innovation to stimulate economic growth while taking environmental factors into account. It positively contributes to national economic growth, creating a win-win situation for nations. | Chang <i>et al.</i> (2024); Xiao <i>et al.</i> (2023); Khalil <i>et al.</i> (2023); Ma and Chang (2023) |
| Sustainable Cities and Communities (SDG 11) | Green finance serves as an attractive financial model for urban development. It backs projects that concentrate on sustainable urban development, improving the resilience and living standards of the cities. | Chan <i>et al.</i> (2022); Yu <i>et al.</i> (2023); Liu <i>et al.</i> (2024) |

| SDGs | Role of Green Finance in Achieving SDGs | References |
|-------------------------|--|---|
| Climate Action (SDG 13) | Green finance supports funding efforts and projects that help reduce climate change by decreasing greenhouse gas emissions and advancing environmental sustainability goals. | Khan <i>et al.</i> (2022); Zhou & Li (2022); Sadiq <i>et al.</i> (2024); Nawaz <i>et al.</i> (2021); Banga (2019) |

6. Implication of the Study

The current paper provides managerial and theoretical implications for future researchers, private and public institutions, and policy-makers. From the managerial perspective, this study suggests that the financial system should be reoriented to support the green economy by encouraging private sector investment in renewable energy and green infrastructure. The government can foster green technologies through incubators and venture support programmes. Financial institutions need to bridge the financing gap by channeling funds from developed to developing countries and supporting green projects on a global scale. This will help in optimizing resource use, reduce waste, and improve operational efficiency, leading to cost savings and reduced environmental impact.

From the theoretical perspective, the study adds to the existing understanding of how green finance and sustainable development are integrated, emphasizing how green finance supports the shift to a low-carbon economy, lowers carbon emissions, raises city living standards, and increases investment in renewable energy and green infrastructure. As the findings section highlights, it advances our theoretical knowledge of the four key SDGs that green financing supports. It also provides theoretical explanations of how green finance might help developing nations achieve sustainable economic growth.

7. Conclusion

The global push for green finance is critical to promoting sustainable development efficiently. Our bibliometric analysis from 2014 to 2024 shows a consistent upward trend in green finance publications, with a significant increase during the COVID-19 pandemic. The research demonstrates an increasing fascination and significant advancement in the field of green finance, namely in its capacity to tackle environmental concerns and foster sustainable economic growth. Significantly, the journal "Renewable Energy and Sustainability" (Switzerland) has emerged as the most prominent publication in this particular area of study. It has received significant contributions from China and notable researchers, including Farhad

Taghizadeh-Hesary. The research on green finance has seen consistent growth in scholarly publications, highlighting a strong academic interest and acknowledgment of its significance. In addition, the bibliometric analysis reveals important areas and potential future study initiatives, including investigating the efficacy of green bonds, examining the influence of regulatory frameworks, and assessing the impact of green financing on the attainment of certain Sustainable Development Goals (SDGs). Green finance aligns with and promotes four of the 17 Sustainable Development Goals (SDGs), which aim to guide countries towards sustainable growth and simultaneously solve pressing environmental concerns. Investments in green finance yield both financial profits for firms and substantial societal and environmental advantages. Notable green finance initiatives encompass public-private partnerships, green bonds, small business microcredit, and smart city projects. These programmes aim to foster transparency and encourage long-term investment strategies. These projects are in line with the United Nations Sustainable Development Goals (SDGs), specifically focusing on the development of sustainable cities, improving the quality of life, and supporting digital governance. Countries must use green financing techniques to achieve sustainable finance, which aims to enhance living standards and boost investment savings. Regulatory regulations that foster the growth of infrastructure, establish trust, and instill confidence in investors are crucial. Contemporary firms need to acknowledge the significance of green finance and sustainable development to maintain competitiveness and make a positive impact on the environment.

8. Limitations and Future Research Direction

The current study used the Scopus database only, limiting the comprehensiveness of its findings. To enhance future research, another database can be used such as Web of Science (WoS) and Google Scholar for a more holistic approach. Further, this study uses research articles, future research may focus on relevant books, book chapters, review papers, and conference papers to broaden the scope of the findings. Additionally, embracing methodologies like Systematic Literature Review (SLR) and Network Analysis may provide a richer understanding of the concerned field.

Conflict of Interest

The author declares that they have no conflict of interest.

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