

GREEN FINANCE AS AN INNOVATIVE SOLUTION FOR TRANSFORMING THE TOURISM INDUSTRY: A BIBLIOMETRIC STUDY

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Abstract

Green finance has an important role in supporting sustainable tourism development while still considering economic, social, and environmental impacts. The urgency of this research lies in green finance which is an innovative solution in funding environmentally friendly projects so that it becomes a great opportunity to encourage the transformation of the tourism industry towards sustainable practices. This research aims to map trends and green finance research networks that play a role in supporting sustainable tourism development. Data analysis was carried out using bibliometric methods sourced from the Scopus database. The results obtained were in the form of a dataset consisting of 654 documents and processed using Rstudio and Biblioshiny. The results show that there has been a significant increase in publications in 2020-2023. It can also be seen that there is a connection between the application of green finance in realizing sustainable development. This is an opportunity to apply to the tourism industry. Apart from that, it was also found that there was a concentration on this research topic in China. It is hoped that the findings of this research will produce a better understanding of trends and research networks in green finance and can contribute to the development of appropriate policies and strategies for sustainable tourism development.

Keyword: green finance; tourism; sustainability; bibliometric analysis

1. Introduction

The tourism industry plays an important role in supporting the growth of the national economy. One of the positive impacts that emerged as a result of the existence of the tourism industry is the increase in employment and income for local communities. Furthermore, the tourism industry makes a significant contribution to infrastructure growth and the development of other sectors in the tourist destination region. For example, the construction of new airports, highways, and tourist accommodations has become a priority investment of the government in an effort to support tourism development in Indonesia. (Sinarta et al., 2022) Investment in tourism infrastructure also boosts local economic growth by increasing tourist visits and expenditures generated during their stay.

According to data from the National Budget Analysis and Financial Accountability Centre (2023), the GDP contribution to the tourism sector in 2020–2022 shows an initial growth trend of only 4% by 2020 to 4.3% by 2022. The industry also contributes significantly to the absorption of the Indonesian labor force, which originally had only 19.46 million people in 2018 and will reach 21.26 million people by 2021. Studies show that tourism has a positive relationship with increasing job creation and contribution to GDP (Nair et al., 2022). The industry's ability to create jobs is highly effective in reducing unemployment and poverty. The job offer in this industry does not require a high level of education or training, so it can help the community develop its potential through entrepreneurship.

However, at the moment, tourism operations are not fully attentive to the environment. Environmentalists have expressed concern about the tourism industry's environmental impact due to improper waste management. The use of plastics, textiles, and other non-biodegradable materials in hospitality contributes to an increase in the population of microplastics that will affect the environment and human health (Pidubnyi et al., 2022). This phenomenon causes the tourism industry to require sustainable development strategies to balance economic, social, and ecological aspects (Mikhaylyuk, 2022).

Green finance, as an innovative solution for funding environmentally friendly projects, offers a fantastic opportunity to drive the transformation of the tourism industry towards sustainable practices. The term green finance in the tourism industry refers to financial mechanisms that support sustainable tourism management practices (Akhmedov, 2023). Furthermore, green finance plays an important role in promoting green innovation products, providing environmentally friendly services, and improving the sustainability of tourism operations (Sudiadnyani et al., 2023). The concept of green finance has developed to integrate environmental protection with economic improvement (Verma et al., 2023). Green finance efforts, such as equities and bonds with environmentally friendly systems, play an important role in transforming the tourism industry by mitigating risk and promoting sustainable development in the eco-sector. The use of green finance enables the tourism industry to start investing through environmentally friendly initiatives such as renewable energy and energy-efficient infrastructure, as well as the introduction of waste management systems, thus reducing the carbon footprint (Xu & Wang, 2023).

The integration of green finance into the tourism industry is considered to support the development of environmentally friendly practices and enable tourism to survive in the long run. This is because green finance plays an important role in mitigating carbon emissions, which are a challenge for today's global business (Xu & Wang, 2023). Experts predict that as

public awareness of environmental conservation increases, the green tourism trend will continue to evolve. Data from Kemenparekraf (2023) indicates that 56.76% of experts endorse the development of eco-friendly tourism options, predicting a surge in tourist demand in 2023–2024.

Despite significant progress in the literature on green finance and sustainable tourism, there remain certain gaps in the field. This includes the need for a more comprehensive study of the impact of investment in the tourism industry, a deeper insight into the role of financial institutions in promoting environmentally friendly tourism practices, and a better understanding of how cultural and regional factors in the presence of green finance influence the tourism industry. Furthermore, as this field continues to evolve, it is important to monitor developments in emerging topics and evaluate their impact on sustainability efforts in the tourism industry.

This research will primarily focus on generating a better understanding of trends and research networks in the field of green finance. It can also contribute to the development of appropriate policies and strategies for sustainable tourism development, including determining whether the number of publications decreases or increases over time. This study will shed light on the collaboration between researchers and research institutions on this topic. Through keyword-based analysis, the research will provide insights and a better understanding of the direction and focus of research in the relationship between green finance and sustainable tourism.

2. Literature Review

2.1 Green Finance

Green finance is a phenomenon that merges the financial and business worlds by implementing environmentally friendly systems. Unlike traditional financing, green finance focuses more on ecological benefits as well as industrial environmental protection (Wang & Zhi, 2016). In various sectors, green finance is the process of allocating resources or capital to financial activities with regard to environmental protection, climate change, environmentally friendly energy, or responsible management (Urban & Wójcik, 2019). According to the People's Bank of China's research Cai & Guo (2021) green finance is a government policy that refers to a set of institutional policies or regulations that have the aim of attracting private funds to the green sector, such as environmental conservation or energy conservation through financial services. In short, green finance can be defined as an investment that can benefit the environment.

2.2 Sustainable Tourism

Sustainable tourism development is a widely recognized concept in the industry. Sustainable tourism involves considering current and future economic, socio-cultural, and environmental impacts (Wibowo & Belia, 2023). Sustainable tourism considers the current and future economic, social, and environmental impacts when meeting the needs of visitors, industry, the environment, and local communities. This approach applies to all forms of tourism activities in all types of tourist destinations, including mass tourism and various other tourist activities. According to the classical definition, Butler's research by Higgins-Desbiolles (2018) affirms that sustainable tourism is defined as tourism that is developed and protected in

a region (community, environment) in a way and scale that allows it to survive for an indefinite period of time, without degrading or altering the environment.

2.3 Bibliometric Analysis

Bibliometric analysis is a statistical method used to evaluate and map scientific publications, authors, and quotations to measure the impact of research, identify trends, and map developments in various fields of science and technology (Saputro et al., 2023). In other words, bibliometric analysis is useful for understanding and mapping accumulated scientific knowledge, as well as the evolutionary nuances of established fields, in a systematic way. Therefore, a well-conducted bibliometric study can form a solid foundation for advancing a field in a new and meaningful way. It enables and empowers researchers to (1) gain a comprehensive picture, (2) identify knowledge gaps, (3) acquire new ideas for research, and (4) position desired contributions in the field (Donthu et al., 2021). By analyzing large datasets from sources such as Scopus, researchers can gain insight into the development of specific research areas, networks of collaboration between authors and institutions, as well as emerging topics in a field. The use of Biblioshiny in bibliometric analysis improves the visualization and interpretation of research results, facilitates a deeper understanding of the scientific landscape, and guides the direction of future research.

2.4 Existing Research

Research into the relationship between green finance and sustainable tourism has become a popular topic in academic literature. Several researchers have carried out studies to determine the impact of eco-system financing systems and green finance practices on the development of sustainable tourism. The research carried out by Pan et al., (2018) provides an overview of the link between tourism and the sustainability of environmentally friendly infrastructure, ecologically friendly agriculture, and technological intelligence. The study by Kumar et al., (2023), which aimed to identify research gaps and future directions in environmentally friendly financing, closely parallels this. Green finance is gaining popularity as a public policy instrument. Researchers say that environmentally friendly financing is vital for sustainable development in the tourism industry.

3. Material and Method

3.1 Design Study

This study employs bibliometric analysis. It was chosen based on the objective of this research, namely to comprehensively analyze trends and research networks on the topic of green finance in an effort to support sustainable tourism development. Bibliometric analysis is used to understand global research trends in a particular field based on the output of academic publications. In addition, this type of mapping can also be used to test how different fields, disciplines, articles, and authors are interconnected. (Alsharif et al., 2020). Donthu et al., (2021) categorize bibliometric analysis techniques into two main groups: (1) performance analysis and (2) science mapping. Performance analysis displays the contributions of research constituents that cover the number of publications and citations per year, while science mapping dispenses the relationships between the constituents of research that include citation

analysis, co-citation analysis, bibliographic coupling, co-authorship analysis, and co-word analysis.

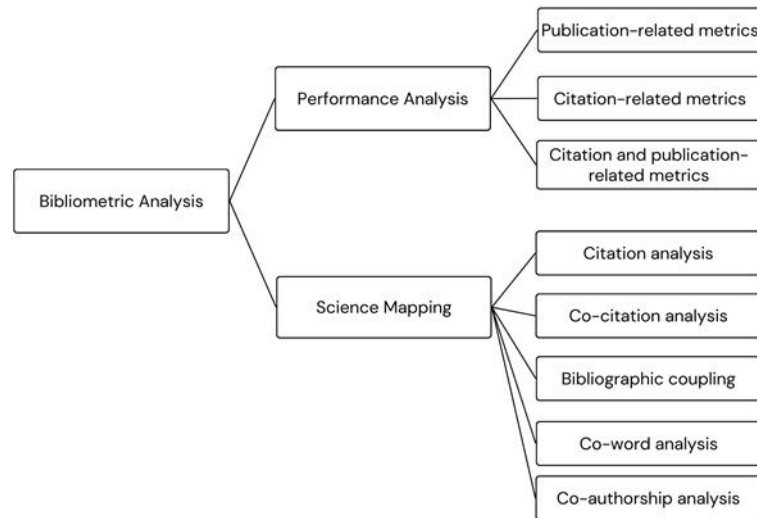


Figure 1. Bibliometric Research Structure

Source: (Donthu et al., 2021)

3.2 Data Collection

This study uses data from articles that examine the relationship between green finance and sustainable tourism practices. The data is collected using Scopus database sources. Scopus is a popular database because it provides a comprehensive and reputable collection of data from scientific publications in a wide range of fields (Ball & Tunger, 2007). It enables researchers to conduct in-depth bibliometric analysis, which includes analyzing research trends, potential collaborations, the impact of publications, and providing a better understanding of knowledge developments in specific fields of study (Muhammad & Triansyah, 2023). The process of searching data in this database is done according to keywords and search strings that have been structured based on previous literature and brainstorming processes, namely "green finance" OR "green financing" AND "tourism" and "sustainability." The year of publication is not included in the filter provisions to be informed about the first article that studies this field and how it has grown. By applying the search string and its filtering, a total of 654 documents were obtained (22 Mei 2024).

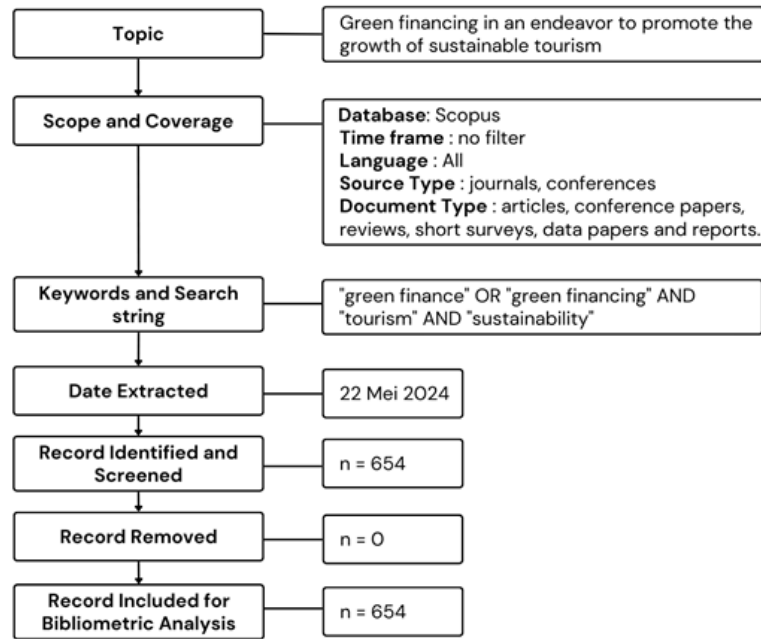


Figure 2. Data Collection Methods

Source: (Ahmi & Saidin, 2022); (Susetyo et al., 2023)

3.3 Data Analysis

This study used Biblioshiny for the Bibliometrix package of Rstudio as the bibliometric method to analyze the dataset (Dhingra et al., 2024). The GNU operating system powers this Java-based analytical software, which performs visual analysis of bibliography data (Susetyo et al., 2023). Consider the appropriate procedures when performing data analysis using bibliometrics. According to Donthu et al., (2021), the measures are divided into four stages: (1) determining the purpose and scope of bibliometric studies; (2) choosing techniques for bibliometric analysis; (3) collecting data for Bibliometric analysis; and (4) conducting bibliometric analysis and interpreting findings.

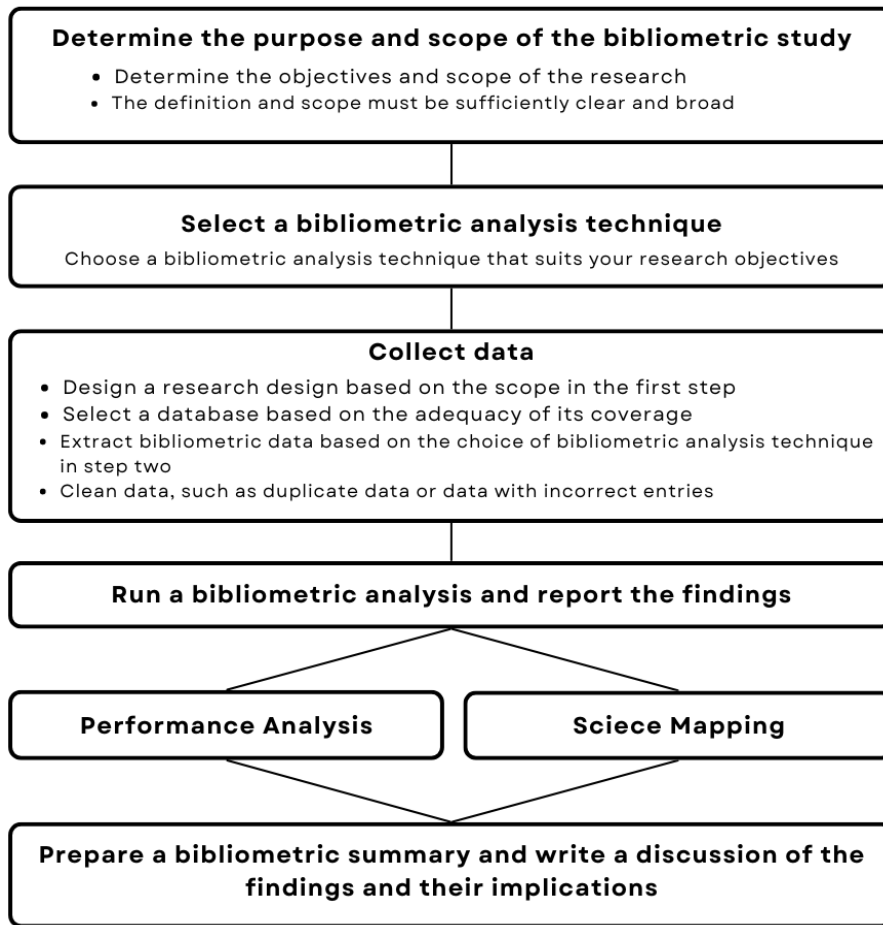


Figure 3. Bibliometric Analysis Procedures
Source: (Donthu et al., 2021)

4. Result

Descriptions of data are one of the most important aspects of bibliometric analysis. (Susetyo et al., 2023). A database must identify the components of the collected data set, such as the duration of publication, the type of document, the source, the author, the number of citations, and so on.



Figure 4. Key Figure of the Data Collection

The above figure shows a summary of statistical data on data sets collected through the Scopus database. The total number of documents in the dataset is 654 from 266 publication sources, with an average quotation per document of 15.76. The data show that the topic has been under investigation since 2010 and continues to increase, with an annual growth rate of 43.17%. The authors involved in the writing of documents on the topic from 2010 to May 22, 2024, 1,628 authors. Most of them have inter-authorship, with a co-author rate per document of 3.18 and international co-authorship of 38.69%.

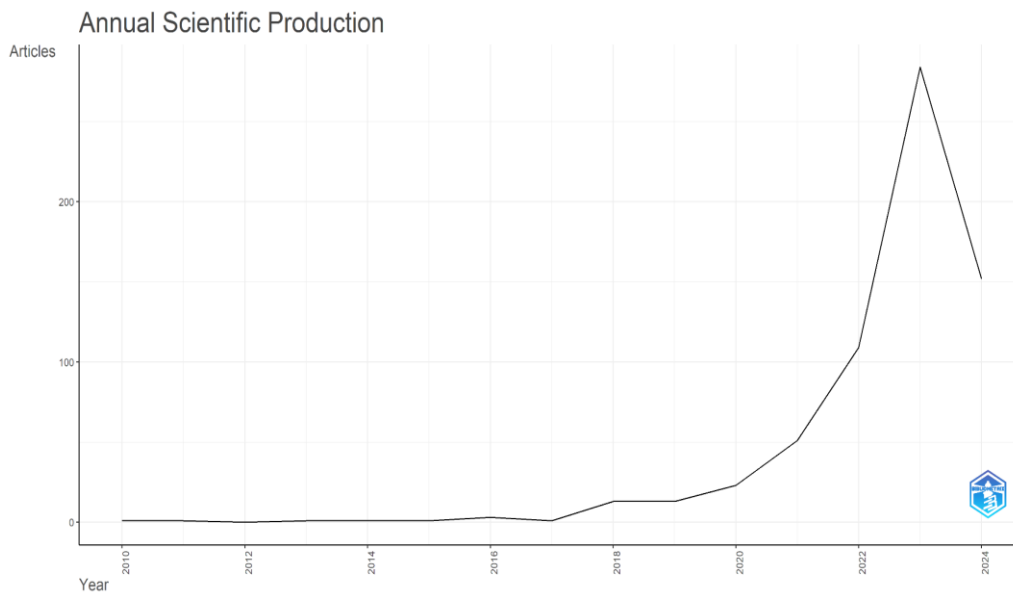


Figure 5. Analysis of the Overall Growth

Publication trends on this topic have generally experienced a gradual rise from 2010 to 2024. Although it appeared slow in the first few years, the chart shows a significant increase of only 19 articles in 2019 and could reach 284 articles by 2023. In 2024, the data collection process took place in May, resulting in a decrease of only 152 articles. However, this does not rule out the possibility of further increases until the end of 2024.

Table 1. Top 20 Most Relevant Sources

No.	Sources	Articles
1	Resources Policy	74
2	Environmental Science and Pollution Research	47
3	Sustainability (Switzerland)	30
4	Renewable Energy	22
5	Energy Economics	21
6	Economic Change and Restructuring	14
7	Economic Research-Ekonomska Istrazivanja	10
8	Environment, Development and Sustainability	10
9	Environmental Science and Pollution Research International	9
10	Frontiers in Environmental Science	9

11	Economic Analysis and Policy	8
12	Energy and Environment	8
13	Humanities and Social Sciences Communications	8
14	International Journal of Energy Economics and Policy	7
15	Journal of Environmental Management	7
16	Sustainable Investments in Green Finance	7
17	Technological Forecasting and Social Change	7
18	Corporate Social Responsibility and Environmental Management	6
19	Journal of Cleaner Production	6
20	Journal of Risk and Financial Management	6

The productivity of the source in publishing articles correlates with the rising publication trend on this topic. Data suggests that the most productive source journal is Resources Policy with 74 articles, followed by Environmental Science and Pollution Research with 47 articles, and Sustainability (Switzerland) with 30 articles.

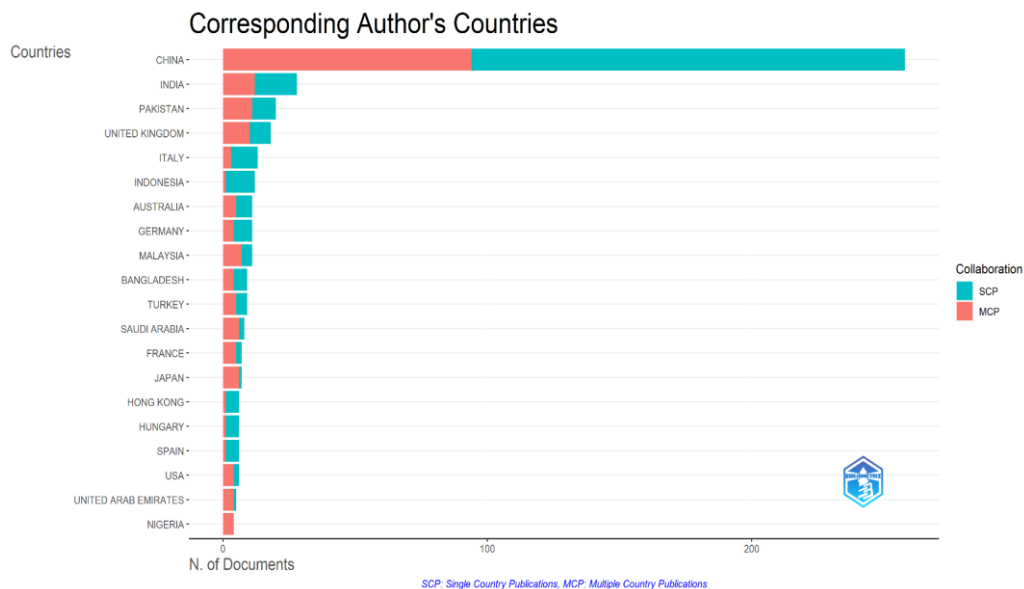


Figure 6. Analysis corresponding author's countries

The corresponding author refers to the author who is responsible for the submission process until an article is published. The single-country publication indicates that all authors are from one country, whereas the multiple-country publication indicates that authors from multiple countries collaborate in the preparation of an article (Sweileh, 2017). The graph shows that China dominates the publication of articles on this topic with 258 articles. The total single country publication (SCP) was 164, and the multiple country publications (MCP) were 94. Next in line was the state of India, boasting SCP 16 and MCP 12, along with 28 articles. Pakistan boasts 20 articles, SCP 9, and MCP 11. With a total of 12 articles, Indonesia holds the 6th position, followed by SCP with 11 articles and MCP with just one. Indonesia's sixth position demonstrates that researchers are interested and aware of the importance of applying green finance to the tourism industry in order to create sustainable tourism practices.

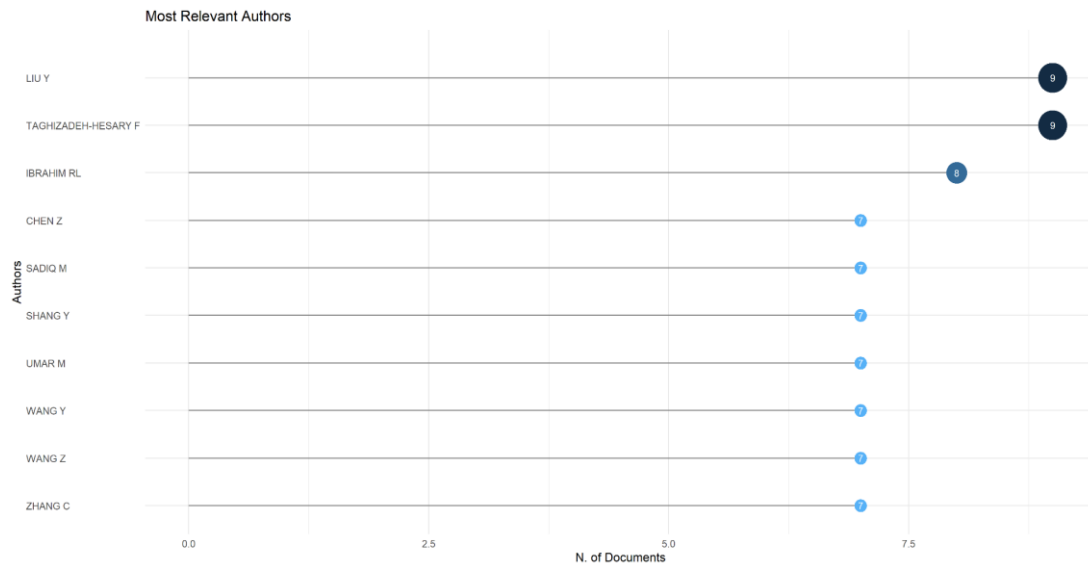


Figure 7. Analysis most relevant author

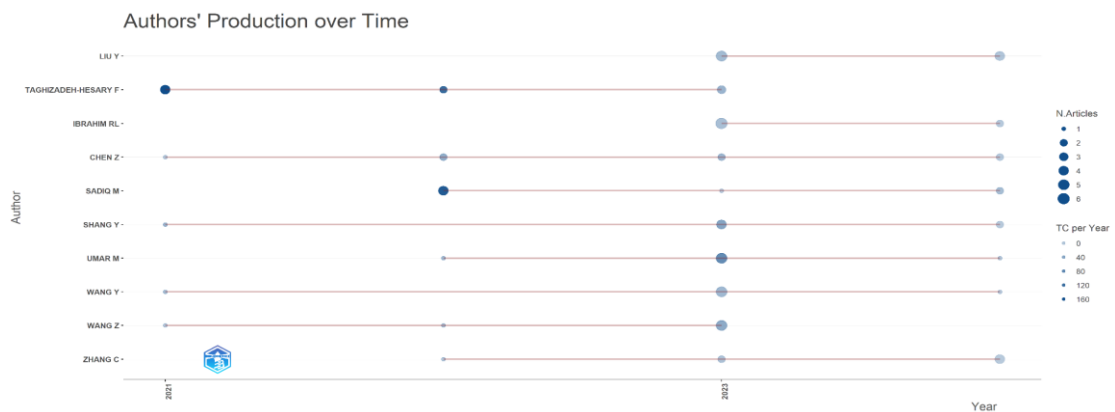


Figure 8. Authors' Production over Time

Liu Y. is the most productive author to study this topic. Despite this, Liu Y. only received 45 quotes for his most popular article, "How Does Economic Recovery Impact Green Finance and Renewable Energy in Asian Economies?" with a total of 24 quotes, compared to Taghizadeh-Hesary F. who received 1004 quotes overall. His most popular articles are "Public Spending and Green Economic Growth in the BRI Region: Mediating Role of Green Finance," with 479 quotes, and "Role of Green Finance in Improving Energy Efficiency and Removable Energy Development," with 282 quotes. He is also the most productive author, with a total of nine articles, and has been actively writing since 2021.

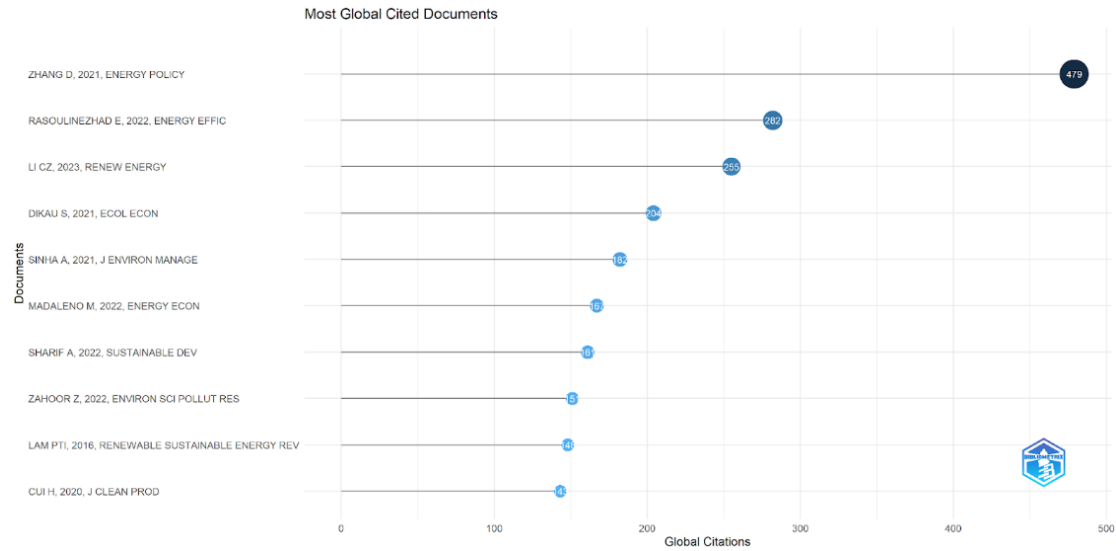


Figure 9. Most Global Cited Document

The analysis of the most globally quoted sources uses a list of references from scientific publications to identify the most frequently quoted resources in a particular field of study. However, the focus is on a global scale, not just on a specific region. According to the figure above, these are the top 10 most quoted documents globally. The top three most cited documents are Zhang D (2021), Energy Policy, with 479 quotes. Then followed Rasoulinezhad (2022), Energy Effic although it has a fairly large difference of 282. Renewable Energy, Li CZ (2023), has 255 quotes.

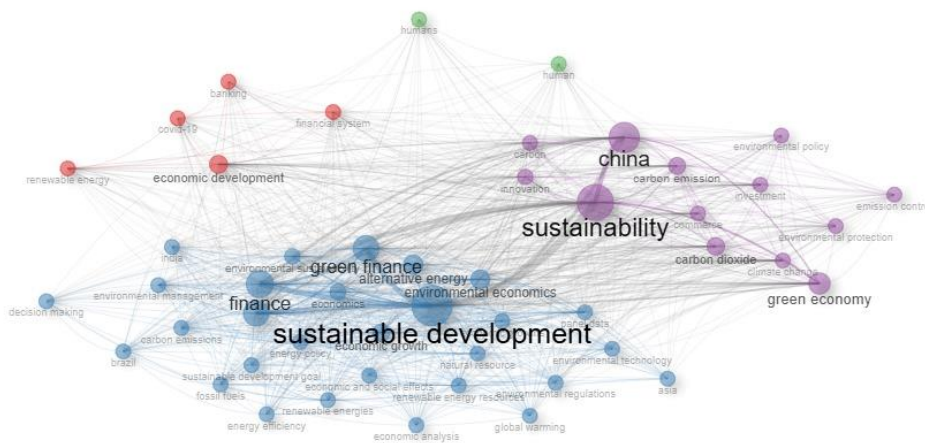


Figure 10. Keyword Co-Occurrence Network and Clustering

In research on green finance and sustainable tourism development, keyword analysis on co-occurrence can provide an overview of the network or relationship between terms. We grouped 654 documents into 4 clusters based on our analysis. The first cluster has a red color and a total of five keywords: economic development, financial system, banking, COVID-19,

and renewable energy. The second cluster is green and contains the keyword human. The third cluster, which is blue in color, includes the most items, containing 28 keywords. These keywords include decision-making, environmental management, India, carbon emissions, Brazil, finance, ambient economics, energy policy, sustainable development goals, fossil fuels, renewable energy, energy efficiency, economic social effect, economic analysis, renewable energy, resource economic growth, natural resource, environment regulation, environmental technology, Asia, panel data, alternative energy, environmentally economic, green finance, and global warming. The most commonly used keywords are sustainable development and green finance. The fourth cluster, with 14 items, includes sustainability, carbon dioxide, climate change, green economics, environmental protection, emission control, commerce, investment, environmental policy, carbon emission, China, carbon innovation, and carbon.



Figure 11. Wordcloud

An analysis of wordcloud based on the keywords shown in the image above shows that sustainable development, China, sustainable finance, economic development, and green finance are the words that have the largest dimension and are the most prominent compared to other topics because they appear most frequently in scientific publications. Moreover, the wordcloud analysis above reveals that environmental, finance, investment, economic, and carbon are among the frequently quoted words in various scientific journals.



Figure 12. Country Collaboratory Network

A country collaboratory network is a visual representation of the patterns of collaboration and network of researchers working in the fields of knowledge management, organizational learning, and tourism business ventures. We derived this map through bibliometric analysis using Biblioshiny. The figure above illustrates how the country collaboratory network identifies the major groups involved in research collaboration in the relevant field. As shown in the picture above, there is a significant disparity in international research collaboration. Some countries, such as the United States, Canada, the United Kingdom, Australia, and China, are highly connected with other countries and produce a lot of collaborative scientific publications.

5. Discussion

The results of the analysis described above can provide an in-depth understanding of how research on green finance and sustainable tourism development has evolved over time. China's significant contribution demonstrates a strong commitment to supporting this research globally. Furthermore, significant international collaboration underscores the importance of cross-country cooperation in addressing global environmental challenges. So analysis can also provide a strong foundation for understanding how green finance can play a key role in sustainable tourism development. This research, which focuses on financial innovation and integrating green financial practices into economic development, can assist public policies and practitioners in directing investment towards environmentally sustainable practices.

This research significantly supports the existing research framework on the link between environmentally friendly finance and sustainable tourism development. So it is important to push for green-oriented financial policies, stimulate international collaboration, and adopt innovative technologies as solutions to address the global environmental challenges facing the tourism industry. However, to incorporate these findings into a more comprehensive and coordinated strategy for sustainable tourism development, more research is necessary.

6. Conclusion, Implication, and Recommendation

The increase in the number of publications in the field of green finance and tourism suggests that this field of study has been quite popular in recent years. The link between applying green finance and realizing sustainable development can be an opportunity to apply this concept to the tourism industry. Green finance refers to financial investments made for sustainable development projects; therefore, its application to the tourism industry is considered capable of addressing environmental problems and other negative impacts caused by its operational activities. The findings of this study are expected to lead to a better understanding of trends and research networks in green finance and can contribute to the development of appropriate policies and strategies for sustainable tourism development.

Bibliometric analysis, despite its advantages, still faces some limitations and relies solely on data collection and analysis techniques that provide only a limited understanding of the field under study. This is because bibliometric analysis is still new in business research (Donthu et al., 2021). Despite this being a different case, bibliometrics databases do not account for whether the author is the first, second, or third author, etc. Furthermore, the value of papers should not be equated because papers published in major journals are not equal to those published in magazines with a lower reputation. Moreover, some papers are rated as performing well because they have more citations (Valenzuela et al., 2017).

This research is limited by the use of a single database, the Scopus database. Therefore, data from other databases, such as Google Scholar, Crossref, Semantic Scholar, Web of Science, or PubMed, may produce different data. However, such datasets must undergo data cleansing to delete duplicate data and data with incorrect entries.

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