

# RESEARCH TRENDS IN SUSTAINABLE FINANCE: A BIBLIOMETRIC ANALYSIS

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## ABSTRACT

Sustainable finance is considered as a set of standards, norms, practices, regulations and products that pursue financial returns along with environmental and social objectives. The present finance industry expresses sustainable finance to be a significant area to boost the industry. Sustainable finance can help build investors' confidence, enable access to investment, attract talent and open the door to funding. Over the past couple of years, it has enjoyed a marked increase in attention. For comprehensive understanding of the existing literature and growing trend of research in sustainable finance, a formal bibliometric analysis will exert a powerful impact. The study aims to highlight the distribution of sustainable finance in the year 2006- 2025 and also the significant documents in this topic. It also points out the most relevant journals in the topic sustainable finance and the significant authors along with the countries. Thus, the software that is used for the bibliometric analysis on sustainable finance is VOS viewer. Dimension AI is used as a database for the study covering the period 2006 to 2025. Study reveals that for the last two years there has been an instant increase in the publication has been observed which signifies that the researchers from different corner of the world started focusing on this particular field as it is important in today's era.

**Keywords:** sustainable finance, bibliometric analysis, climate change.

## INTRODUCTION:

The concept of sustainable development developed significantly in the 1970s and 1980s (Judijanto et al., 2024, Ziembra, 2023, Mahesh et al., 2022). The main goal of a sustainable development policy is to provide current and future generations with the life resources (Ziembra, 2023). Sustainable development concentrates on three aspects: economic, social, and environmental, which influence on world economy (Schoenmaker and Schramade, 2019, Mahesh et al., 2022). Unlike conventional finance, sustainable finance seeks to integrate social, environmental, and climate change considerations into financial institutions' business strategies (Kashi & Shah, 2023, Edmans, 2022). Sustainable Finance is considered as an important pillar to boom the present finance industry. It has enjoyed a marked increase in attention over the past couple of years. One indication of the growing importance of sustainable finance is its increasing financial weight (Dimmelmeier, 2021). Another indication is low-carbon economy criteria, climate-resilient development indicators set out by the COP-UNFCCC, and the comprehensive global development framework set by the United Nations under the 2030 (Kashi & Shah, 2023, Simeonovski et al., 2025, Trandafir, 2023). Essentially, sustainable finance recognizes that traditional financial practices often overlook the broader impacts of investments on society, the environment, and future economic security (David et al., 2025).

Currently, sustainable financing encompasses a perfect coordination between financial prosperity, social well-being, and environmental protection (Ermela, 2024). It has an important role in finance and involves multiple issues related to connecting sustainability goals with financing activity (Haigh, 2012). More recently, On 13 October 2021, the G20 Finance Ministers and Central Bank Governors' meeting pointed out that "sustainable finance is crucial to green transformation" and approved the "G20 Sustainable Finance Roadmap" and "G20 Comprehensive Report on Sustainable Finance (Luo et al., 2022). The Indian financial system is comprised of various components namely financial institutions, markets, instruments, services and numerous intermediaries channelizing financial activity. The implementation of sustainability to those arenas is the indisputable need of present financial system. And it is widely acknowledged that supporting the transition to a low-carbon, green and sustainable economy needs forefront of efforts to build a financial system (Suer, 2020). Thus, it is essential to have a through framework that helps set directional transformation of the financial systems, institutions, markets, instruments, services, and intermediaries with the demand of sustainability transitions. In this regard, it can be stated that sustainable finance is an evolutionary shift in the financial system.

The concept of Sustainable finance is very wide inclusive of various components. A variety of financial instruments are employed in green finance, including green bonds, green loans, and sustainable asset management strategies (Judijanto et al., 2024). Each of these instruments has its significant role to execute sustainability globally. However, implementing standards for sustainable finance is quite challenging (Mudra, 2024). A global framework for incorporating environmental, social and governance considerations into the operations and core business strategies of the current financial industry has been established by numerous national and international organizations, including ISO 32210, the Sustainable Finance Disclosure Regulation, the Corporate Sustainability Reporting Directives, and others.

Sustainable finance is becoming increasingly important globally because it is one of the most innovative growth trends in the financial sector (Sharma et al., 2023). Despite the critical importance of sustainable finance, there is a discernible gap in synthesized knowledge that maps the evolution and thematic progression of green finance within the broader financial system (Judijanto et al., 2024). Given this context, review on sustainable finance will address the diverse perspectives on the relationship between sustainability and finance by thoroughly evaluating the existing literature (Kumari & Jaiswal, 2023). Thus, Bibliometrics can provide us with a new perspective of understanding the current status and development trends of knowledge in a specific field (Luo et al., 2022). It was first used in 1969 by Alan Pritchard and has gained wide popularity to aid quantitative and objective analysis in understanding the literature, and is often used to systematize the information in a particular thematic field (Becker, 2023). A formal bibliometric analysis can offer comprehensive understanding of the existing literature and growing trend of research in sustainable finance.

The burgeoning literature on sustainability and finance in developing nations reflects a diverse landscape of research, policy analyses, and practical interventions to foster sustainable development trajectories (Kumari & Jaiswal, 2023). Thus, from a bibliometric perspective, it may evaluate the contribution of current and upcoming research in sustainable finance. Accordingly, the researcher has framed several research questions to highlight ongoing research in sustainable finance and identify the most pertinent journals, authors, and nations distinguished by their contributions in the same field. The research questions are as follows:

- RQ1: what is the distribution of sustainable finance in the year 2006- 2025?
- RQ2: what are the significant documents in the topic sustainable finance?
- RQ3: what are the most relevant journals in the topic sustainable finance?
- RQ4: who are the significant authors in the topic sustainable finance?
- RQ5: what are the most significant countries in the topic sustainable finance?

## RESEARCH METHODOLOGY

The software that is used for the bibliometric analysis on sustainable finance is VOSviewer. VOS ("visualization of similarities"), a concept that was developed less than two decades ago for analysing and visualizing patterns within data. Years later, the VOS concept was developed into a program called VOS viewer for bibliometric analysis, hence, it has been widely adopted in bibliometric and citation studies for constructing and visualizing bibliometric networks, with journals, researchers, or individual publications as actors, based on co-citation, bibliographic coupling, or co-authorship relations (Bukar et al., 2023). The database used for the study is Dimension AI covering the period 2006 to 2025. The Dimension AI platform has resulted the most systematic collection of linked data related to global research. The study includes publication of articles within this time frame. In the light of this, the authors realised that the selected database is suitable for the proposed research. The findings from the bibliometric analysis will be within the broader context of existing research in the field of Sustainable Finance. This approach will simplify the identification of prevailing trends and patterns in the data, and also revealing both the strengths of the current body of knowledge and the gaps that requires further exploration (Vardari, 2025).

The main keywords used for the extraction of the data items are ‘sustainable finance’ OR ‘green finance’ OR ‘sustainable banking’ OR ‘green banking’ OR ‘sustainable and responsible investment’ OR ‘climate finance’ OR ‘carbon finance’ OR ‘sustainable investing’ OR ‘green bonds’ to be present in full text. Further filtration is done based on the time period, source title and publication type to obtain the exact data items for the bibliometric analysis. A total number of 7,34,853 articles were obtained, which became the raw database for the research paper i.e. the data obtained before further filtration. The time period selected is from 2006-2025, publication type is article only and source title is Environmental Science and Pollution Research OR Sustainability OR Journal of Cleaner Production. The final data items found after the inclusion criteria is 339. Table 1 shows the inclusion criteria for the data extraction.

**Table 1: Inclusion criteria for data extraction**

Inclusion criteria	Area
Time period	2006-2025
Publication type	Article only
Source title	Environmental Science and Pollution Research OR Sustainability OR Journal of Cleaner Production

Source: Dimension AI database

## RESULT

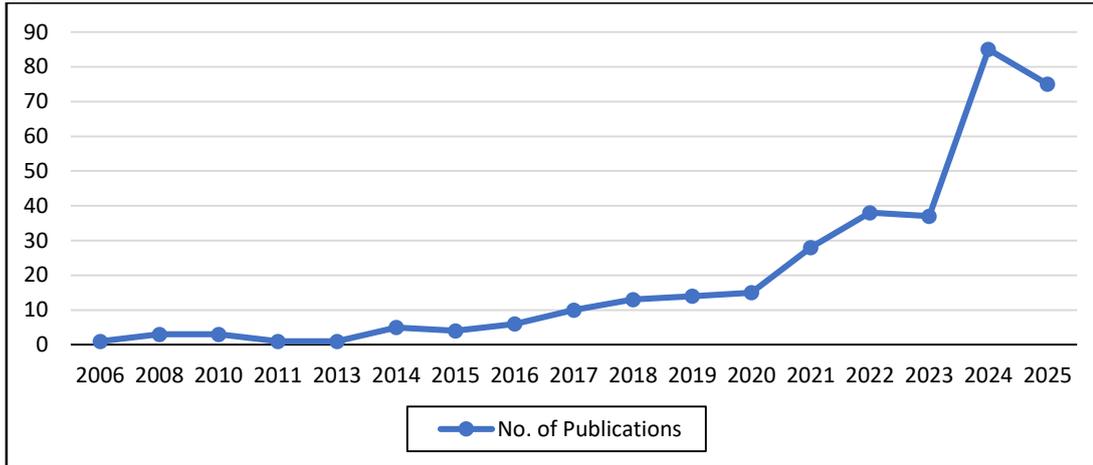
The data item extracted from the database undergoes further analysis using VOS viewer software and the result obtained as per the research question are shown below using trend analysis and various types of citation analysis.

### Annual trend analysis

The annual trend analysis shows the publication every year in the area of sustainable finance. The analysis is based on the articles only from the year 2006-2025. During the selected time frame, it has been seen that the publication from the year 2006 has an upward shift, increasing from 01 publication in the year 2006 to 75 publication in the year 2025, which indicates that the research

in the area of sustainable finance is increasing worldwide and this area is also targeted by the researchers which has led to its growth till now.

**Figure 1: Annual distribution of the research article**



Source: Dimension AI database

**Citation Analysis**

Citation analysis is the analysis of the citation or bibliographical reference that is appended with the research communication (Gohain & Saikai, 2014). It is a bibliometric research method that utilizes mathematical, statistical, and logical approaches to analyse citation patterns in scientific journals, papers, and authors (Song et al., 2024). Citations reveal which articles have been influential in the literature (Dalen &Henkens, 2000). Therefore, citation analysis can explore and comprehend the breath of study already conducted in the field, which will further help scholars and researchers in contributing new elements to the structure.

**Document citation analysis**

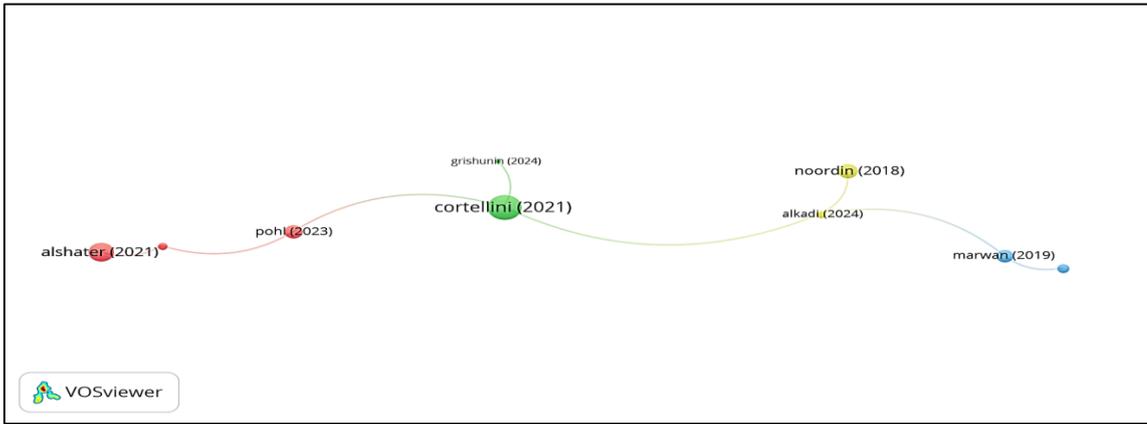
Document citation helps to identify the document that has the highest citation in the particular field. Citation analysis is conducted with the unit analysis of document providing the criteria of minimum number of citations of a document to be 01. Figure 2 shows the graphical representation of the analysis. The bigger the node, the more is the citation of the document. The authors of the document are: Aggarwal et.al. (2025), Alshater et.al. (2021), Pohl et.al. (2023), Cortellini et.al. (2021), Grishunin et.al. (2024), Azman et.al. (2022), Marwan et.al. (2019), Alkadi et.al. (2024). The top 5 documents in the area of sustainable finance are shown in Table 2.

**Table 2: Top 4 documents in the area of sustainable finance**

Title	Journal	Author	Year
Green Bond: A Systematic Literature Review for Future Research Agendas	Journal of Risk and Financial Management	Cortellini, Giuseppe; Panetta, Ida Claudia	2021
Journal of Sustainable Finance and Investment: A bibliometric analysis	Journal of Sustainable Finance & Investment	Alshater, Muneer M.; Atayah, Osama F.; Hamdan, Allam	2021
Borrower- and lender-specific determinants in the pricing of sustainability-linked loans	Journal of Cleaner Production	Pohl, Christian; Schäfer, Gregor; Schiereck, Dirk	2023

Source: Dimension AI data processed in VOS viewer

**Figure 2: Document citation analysis (network visualisation)**

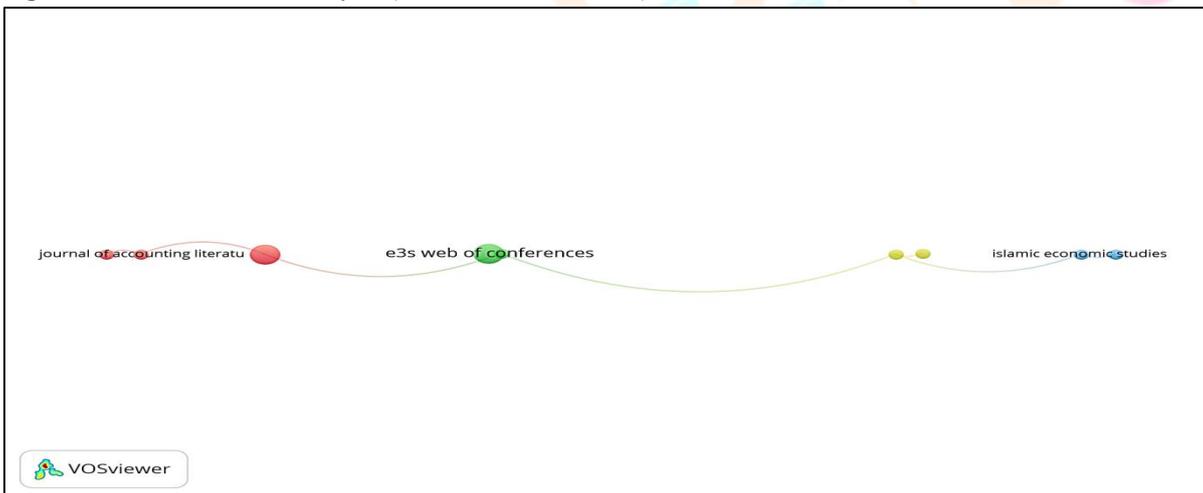


Source: Dimension AI data processed in VOS viewer

**Source citation analysis**

Source citation analysis depicts the journals with a good number of documents published in the particular journal in the premises of sustainable finance. For this analysis, the unit of citation analysis is ‘source’ with the minimum number of documents of a source to be 01 and minimum number of citations of a source to be 01. The result obtained from the analysis is shown in the Figure 3. The journal obtained from the analysis are: journal of accounting literature, journal of cleaner production, journal of sustainable finance & investment, e<sup>3</sup>s web of conference, journal of risk and financial management, Islamic economic studies, Isra internation journal of Islamic finance, Journal of Islamic accounting and business research, Review of accounting and finance.

**Figure 3: Source citation analysis (network visualisation)**



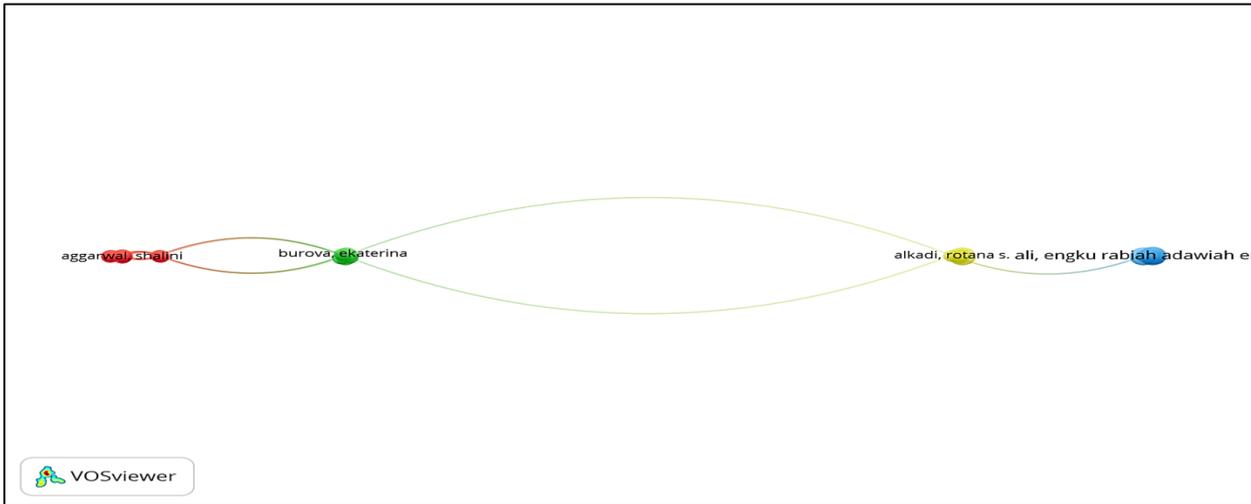
Source: Dimension AI data using VOS viewer

**Author citation analysis**

The citation analysis of author helps to find out the authors with maximum total link strength. Total link strength measures the strength of the node connection with the other nodes. For the analysis, the minimum number of a document of a source selected is 01, minimum number of citations of a source is 01. Based on the given criteria, the result obtained is shown in Figure 4. The authors with the total link strength of more than 6 are Cortellini et.al., Panetta et.al., Alkadi et.al., Pohl et.al., Schiereck et.al., Schuler et.al.

Research Through Innovation

**Figure 4: Author citation analysis (Network Visualisation)**

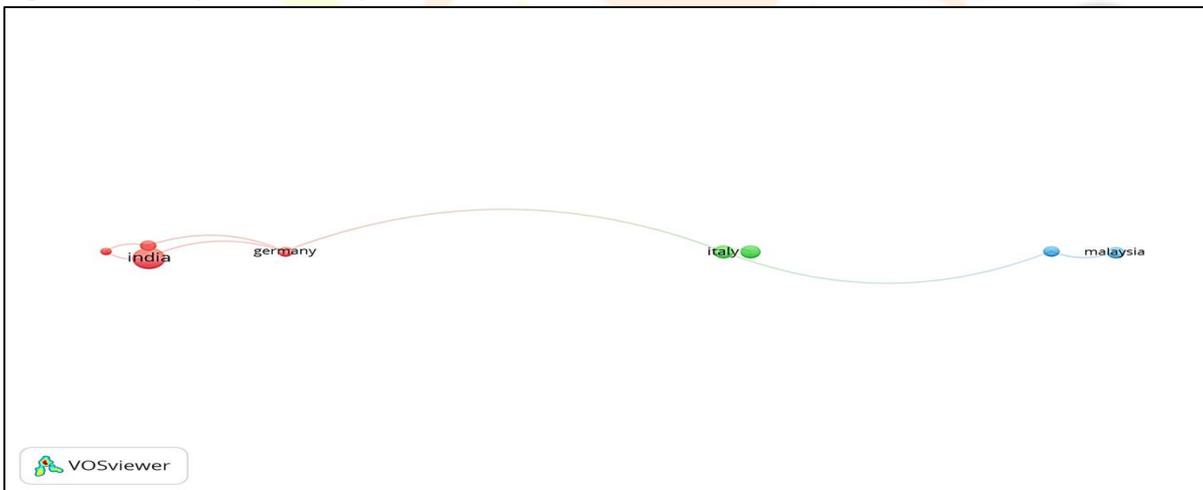


Source: Dimension AI data using VOS viewer

**Country citation analysis**

Country citation analysis is another type of citation analysis that helps to identify the country where the research is undertaken in the field of sustainable finance and also the link strength between the authors of the country. The minimum number of a document of a source selected is 02, minimum number of citations of a source is 02, for the purpose of the analysis. Figure 5 shows the result of the country citation analysis. The country that is depicted in the figure shows that the works of these countries are cited by the authors of the other country. The country with the total link strength of 3 are Germany, Italy, Saudi Arabia, with the total link strength of 2 are Australia, India, Malaysia, Spain, Ukraine, UAE, with the total link strength of 1 are Denmark, Portugal, Russia. The country with highest number of documents is China but the total link strength is 0, followed by USA with the total link strength of 0. India comprises of 29 documents in the field of sustainable finance and 522 citations.

**Figure 5: Country citation analysis (Network visualisation)**



Source: Dimension AI data using VOS viewer.

**DISCUSSION**

In this part of the study, the focus is given on the discussion of the research questions.

**Research question 1:** The aim of this research question is to examine the publication of article in various journals in the area of sustainable finance during the time period of 2006-2025. From the year 2006 till 2023 there is a stable increase in the number of publications in sustainable finance but from 2023 to 2024 an instant increase in the publication has been observed which signifies that the researchers from different corner of the world started focusing on this particular field as it is important in today’s era.

**Research question 2:** Among various documents published in the field of sustainable finance, the most popular and cited document are ‘Green Bond: A Systematic Literature Review for Future Research Agendas’, ‘Journal of Sustainable Finance and Investment: A bibliometric analysis’, ‘Borrower and lender-specific determinants in the pricing of sustainability-linked loans. According to Cortellini & Panetta, 2021, green bond is an environment friendly way of investment that leads toward the sustainability of the economy. Alshater et al., 2023 in the study focused on the various themes studied so far based on sustainable finance and investment. The study in the area of ESG and ‘sustainable finance’ is taking over the place of ‘corporate governance’ and ‘socially responsible investment’. Pohl et.al. (2023) aims at sustainability linked loans which is beneficial for the investors and environment as well. There is a shift found in the research area which is towards the sustainability link loans.

**Research question 3:** Journal of accounting literature, Journal of cleaner production, Journal of sustainable finance & investment, e<sup>3</sup>s web of conference, Journal of risk and financial management, Islamic economic studies, Isra internation journal of Islamic finance, Journal of Islamic accounting and business research, Review of accounting and finance are found to be the significant journals where the publication of the research area i.e. sustainable finance is maximum seen. The total link strength of this journal is also observed to be high among various other journals of this area. This signifies that the documents of these journals are cited more by the authors in their researches.

**Research question 4:** Cortellini et.al., Panetta et.al., Alkadi, R.S., Pohl et.al., Schuler et.al. are the authors with the total link strength of more than 6. From this analysis, it is identified that the research of the authors is cited by the other researchers in the field of sustainable finance as it may resemble the work in some context. Abed & Alkadi, 2024, in the study, aims at the importance of green sukuk which is a financial investment tool and it also environment friendly. This tool is specially seen in the Islamic countries.

**Research question 5:** Among all the countries, Germany, Italy, Saudi Arabia, Australia, India, Malaysia, Spain, Ukraine, UAE, Denmark, Portugal, Russia are the countries which has the total link strength of 1 or more. This states that the work of these countries in the field of sustainable finance is cited by the authors who are working in the relatable research area. The citation by the authors signifies that there is awareness about the concept and importance of sustainable finance in these countries. Countries link China, USA has the highest number of documents in the area of sustainable finance but with 0 total link strength which denotes that the work done in these countries are not cited by the authors of other countries.

### Conclusion and future scope

The current study presents bibliometric analysis in the arena of sustainable finance. The literature covered by the analysis spans the years 2006–2025. The study demonstrates that while sustainable finance has become a prominent field of study in recent years, the last two years have seen a sharp rise in this field of study since sustainability implementation is essential for the near future. According to the study, there are a lot of published articles on green bonds, green loans, green banking, and ESG (Environmental, Social, and Governance) criteria in the economy, which indicates the divergent components of research in sustainable finance. Furthermore, studies on sustainable finance are being published by a number of prestigious journals and publications, demonstrating the strong growth and development of sustainable finance in the economy and the spreading importance of research in sustainable finance among researchers and academicians in the said field. Therefore, there are different renowned authors who have worked hard to find novel aspects of sustainable finance and are currently working to add more flair to the field. Lastly, the present research attempted to study how different countries are contributing to the ongoing research of sustainable finance. While the countries like Germany, Italy, Saudi Arabia, Australia, India, Malaysia, Spain, Ukraine, UAE, Denmark, Portugal, Russia are aware of the shift from traditional finance to sustainable finance but the countries like China and USA has the highest numbers of contribution in the literary field of sustainable finance. In this sense, it can be stated that sustainable finance has made its mark in every corner of the world and earned its status in global index of research.

However, the present research study is limited by certain criteria as mentioned below:

- Using of dimension AI software has some demerits when the analysis is done based on the VOS viewer software. One is that the software doesnot support the keyword co-occurrence analysis.
- The study is focused only on the time period of 2006-2025. as the data available in the database for the 21<sup>st</sup> century is from 2006 using the keywords.
- The study has focused only the articles. So, for the future studies focus can be given on the conferences, book chapters etc.

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