




A Scientometric Map Illustrating Sustainable Performance Through Bibliometric Analysis

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ABSTRACT

The field of sustainable performance (SP) research is expanding quickly, involving both industry and academia. In line with current developments in bibliometric research, the objective of this research is to map out the knowledge concerning the topic of sustainable performance (SP) and to identify current and future research trends. To present a detailed bibliometric study of the theoretical literature on SP reported in 202 articles between 2015 and 2022. This study identifies the most significant papers while presenting the key elements of the body of knowledge in this academic subject. It does this through the use of two sophisticated bibliometric visual software tools, Vos Viewer R studio, as well as the use of numerous bibliometric studies such as bibliographic coupling, co-citation and co-authorship analysis, and term co-occurrence, burst detection analysis, and timeline view analysis are all examples of bibliographic coupling. The paper concludes by discussing the utmost popular study subjects and suggesting recently developed research topics that scholars with an interest in SP should put on their future research agenda. This paper presents the findings of a bibliometric investigation on performance measurement systems and sustainability, with a focus on industrial systems. The findings point to a misalignment between performance assessment and sustainability.



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1. Introduction

Because sustainability includes several stakeholders with diverse interests and expectations, it is inherently complex (D'Adamo & Sassanelli, 2022). Because sustainability includes several stakeholders with diverse interests and expectations, it is inherently complex (Clarkson, Overell, & Chapple, 2011). Businesses have significant challenges in today's socioeconomic climate, so developing new or better methods to compete and enhance their

value is vital (Qadri et al., 2023; Shahzadi, Sheikh, Sadiq, & Rahman, 2023; Zhao et al., 2023). This is because long-term firm performance is dependent on the environmental and effective harmonization of financial, and social factors (Ullah, ur Rahman, & Rehman, 2023; Usman, Rahman, Shafique, Sadiq, & Idrees, 2023). Even though there are several significant review publications in the field with varying focuses, (Geissdoerfer, Vladimirova, & Evans, 2018; Shakeel, Mardani, Chofreh, Goni, & Klemeš, 2020). There is no clear evidence of a detailed literature assessment using bibliometric analysis on the broad subject of SP.

Businesses in many areas, such as energy and the bio-economy, examine the triple bottom-line repercussions of their actions to demonstrate their sustainability performance (SP). The intellectual structure allows the significant publications, source titles, countries, institutes, and authors to be included, this research aims to map the problem of SP. (D'Adamo & Sassanelli, 2022).

On the one hand, SP displays to shareholders and business stakeholders an organization's commitment to the notion of sustainability (Brown, De Jong, & Lessidrenska, 2009). Sustainability performance reports, in addition to addressing stakeholder concerns, assist company leaders and shareholders in understanding how their activities affect the environment (Clarkson et al., 2011). Because sustainability includes several stakeholders with diverse interests and expectations, it is inherently complex (D'Adamo & Sassanelli, 2022). In response to growing public demand for information on how businesses engage with society, particularly how they advance the financial, environmental, and social well-being of the communities in which they operate, the relatively new concept of social performance (SP) was developed ("Sustainability accounting and reporting: development, linkages and reflection. An introduction," 2006). Published Management of SP, monitoring, and reporting in an integrated manner (Awan, Rahman, Ali, & Zafar, 2023; Fatima, Jamshed, Tariq, & Rahman, 2023; Kanwal, Khalid, & Alam, 2023; Shahzadi, Ali, Ghafoor, & Rahman, 2023). SP is complicated by the deficiency of suitable and effective governance and practices for firms to transfer their sustainability by performance to investors diagonally the three sustainability dimensions. These ideas emphasize the impact of business decisions on the triple bottom line—the economic, social, and environmental aspects that influence organizational performance (Choudhuri & Chakraborty, 2009).

In order to satisfy the demands of their shareholders, a number of companies highlight and report on their sustainability performance in their annual reports (Javaid, Noor, Hassan Iftikhar, Rahman, & Ali, 2023). It is critical to define and communicate sustainability objectives to business stakeholders in order to successfully execute sustainable practices (Ilyas, Banaras, Javaid, & Rahman, 2023; Shahid, Gurmani, Rehman, & Saif, 2023). When ecological challenges and sustainability-related understanding are not shared, they become non-existent and socially useless (Ziemann, 2011). Despite the benefits of SP (SP) in educating business stakeholders about the challenges and successes of sustainable activities, it falls short in fostering dialogue with After retrieving relevant peer-reviewed literature on SP from multiple databases, this paper extensively evaluated it. By covering these important issue areas and emphasizing the progress of sustainability performance reporting research throughout time, this bibliometric analysis provides a roadmap for the future research agenda and SP practice (Mukhtar et al., 2023; Nawaz, Rahman, Zafar, & Ghaffar, 2023; Tabassum, Rahman, Zafar, & Ghaffar, 2023).

2. Literature

Some scholars believe that bibliometric analysis is one of the greatest ways to graphically display major themes and develop research areas in a field of study. It is also an efficient method of presenting the fruition and associations of elements in a topic or publication by analyzing appropriate material (Liu, He, Cao, Li, & Jian, 2022).

The key benefit of bibliometric scrutiny is that it may show the internal dynamics, present state, and future potential of a certain study area (Liu et al., 2022).. The academic literature has been rife with debates on sustainability. The concern for sustainability represents how managers conduct their businesses, as well as the behavior of global communities towards sustainable practices or acts (Novais, João, & Serralvo, 2012). The goal of this study is to provide a comprehensive overview of the literature in the field of SP research by conducting a thorough bibliometric analysis on a sample of 201 documents from journals only for the years 2015-2022 using Vos Viewer and Scopus, two bibliometric software tools. A thorough visual representation of the body of knowledge regarding SP can be obtained by combining specific science mapping techniques, such as co-citation analysis, co-occurrence analysis, bibliographic coupling, and co-authorship analysis, with enrichment bibliometric techniques, such as networks and clustering visualization (Shafqat, Idrees, Zaman, & Ghaffar, 2023).

3. Reporting on Sustainability Performance Overview

The Global Reporting Initiative (GRI) is famous for establishing, evolving, and distributing internationally valid standards for sustainability reporting. Although the concept of a SP report (SPR) is still important today, different organizations report in various ways as a consequence (Mussari & Monfardini, 2010).

The performance report (PR) is a tool for assessing how a company's activities, products, and overall commitment to sustainable development effect the economy, society, and the environment (Hassan, Sheikh, & Rahman, 2022; Khan, 2022; Shafqat et al., 2023). The term "SP report" (SPR) refers to a framework that includes criteria, policies, indicators, principles, conceptual models, and goals Fonseca et al. As a result, organizations' aims should extend beyond shareholder profit since they must consider how their activities may influence other stakeholders (Rezaee, 2018). To assess how successfully organizations promote sustainable development, they should employ formal, specified performance indicators (Baumgartner, 2008).

Performance indicators have been shown to be the most helpful instrument for monitoring sustainability performance for management and decision-making purposes (Staniškis & Arbačiauskas, 2009). Biomethane plants, for example, may have beneficial economic and social advantages, but it is critical to evaluate their long-term ramifications and how they may influence stakeholders.

3.1. Ecological Sustainability

Every organization has an impact on environmental resources. As a result, environmental sustainability, unlike other aspects of sustainability, has been the subject of several studies. Most of the research that is currently available suggests that companies should create policies to ensure that natural resources are used responsibly for both present and future generations (Brown et al., 2009).

3.2. Monetary Sustainability

A sustainable economy's sole purpose is to collect more capital generated by humans. The term "economic sustainability" is defined in this research as the method by which economic activity boosts capital created by humans without depleting natural, social, or human capital. Economic sustainability states to long-term viable activity growth that does not jeopardize the community's environmental, social, and cultural values (van Niekerk, 2020). According to this point of view, economic performance measures should demonstrate how an organization's economic operations influence all stakeholders, emphasizing how enterprises contribute to the economic health of their local community (Khoula, ur Rehman, & Idrees, 2022; Li et al., 2022; Zulfiqar et al., 2022).

3.3. Social Sustainability

Because of the absence of a clear and coherent definition of social and communal sustainability, practitioners, especially corporations, commonly mix it up with corporate social responsibility (Åhman, 2013). Despite the literature's lack of consensus, social sustainability emphasizes the linkages between human activities and stakeholders, especially communities, and addresses intra- and intergenerational equity. Sustainability performance reports (SPRs) are a useful tool for organizations to incorporate sustainable practices into their planning, implementation, control, and decision-making procedures. SPRs are a must for organizations because achieving sustainable development requires them (Baumgartner, 2008).

Researchers contend that because sustainability performance reports provide data on companies' advancements in areas like social, economic, and environmental sustainability, they are helpful for public policy and communication (Singh, Murty, Gupta, & Dikshit, 2009). This viewpoint highlights the inequality in information gathering, writing, and dissemination practices related to organizations' sustainability performance (Hafiza et al., 2022; Shahid, Muhammed, Abbasi, Gurmani, & ur Rahman, 2022).

Research question related to SP in bibliometric analysis

- RQ1: Which countries, journals, writers, and research papers have the greatest sway in this field?
- RQ2: Which major developments of SP research are likely pave the way for future studies along previously uncharted paths?
- RQ3: How is the body of knowledge about SP organized intellectually?
- RQ4: Which subjects have been studied the most, both in terms of frequency of study and current level of interest?

4. Methodology

This bibliometric research was carried out using data from the Scopus which is a popular database, which is the most well-known database in the world. Scopus offers significant data on a wide range of study areas, including business studies, management, accounting, finance, and a wide range of other social science-related topics it is chosen to adopt a bibliometric methodology that analyses bibliometric and bibliographic data using numerical methodologies. In contrast to standard systematic literature reviews, bibliometric reviews can give information about topics that have an abundance of bibliometric and bibliographic data. We particularly follow a four-step procedure for bibliometric reviews, which involves setting the review's aims and scope, selecting an analytical method, acquiring data for analysis, finishing the analysis, and summarizing the results.

Table 1
Principles for the assortment of documents from Scopus

Serial	Search Steps	Records
1	The papers with the word " SP in the title , abstract and keywords	201
2	Limit to (All open access)	
3	Limit to language: English	1765
4	Journals	2015-2022

Four stages of process

- **Historical development**
Analysis of the abstracts and titles used to represent the historical development of SP.
- **Co citation analysis**
Profile of the top co cited reference on SP

- **Co Authorship Analysis**

Examination of the network established by the global coauthors hip collaboration on the topic of SP discourse

- **Time zone analysis**

To analyze the data, a four-stage procedure was used. First, historical analysis was performed, followed by co-citation analysis utilizing the VOS viewer programmer of analysis. Furthermore, analyses were performed based on co-authorship and a time zone split.

4.1. Research Design

For that reason, and in line with the most recent research trends. For this bibliometric analysis, 201 records were chosen from the search engine of the Scopus support database using the study methodology that was explained for this inquiry (Anuar, Marwan, Smith, Siriyannun, & Sharif, 2022; H. Hassan et al., 2022).

All papers containing the phrase "SP" are searched first, using titles, keywords, and abstracts. The study's bibliometric indicators were authors, languages, journals, nations, and knowledge disciplines. This analysis consists of 201 papers based only on scholarly publications. A synopsis of the data analysis is provided. Diagram 1 also includes a nation versus vice analysis. Whereas China has a larger part of the research market, the United Kingdom is second and Pakistan is third. For this study, we utilize VOS viewer.

4.2. Bibliometric Analysis

A current subdivision of scientometrics, use statistical tools to evaluate the excellence of systematic work in a certain field of study (Broadus, 1987). Using this method, great numbers of scientific data may be potted to signify the current rational environment and upcoming trends in a positive subject area (Donthu, Kumar, Pattnaik, & Lim, 2021). As the bibliometric field has grew significance between commercial and monetary scholars. The WOS categories of architecture, biology, chemistry, engineering, computing, and medicine were left out. (1.288) Article category Only reviews and document-type publications (201) documents were included in the search parameters. Thus, meeting abstracts, books, book reviews, records papers, and reporting resources were omitted. Not included were any articles written in languages other than English. After a modification, abstracts of 593 open access publications were reviewed, and any redundant documents were removed (Donthu et al., 2021). Donthu, et al, By offering a comprehensive guide on how to conduct bibliometric analyses in economics and business academics in an appropriate way through publication, 2021 closed this gap. In bibliometric analysis, two essential strategies that must be employed are performance analysis and science mapping (Aria & Cuccurullo, 2017; Donthu et al., 2021). Activity indicators serve as the foundation for performance analysis (Moondra, Christian, & Jariwala, 2020). (Mingers & Leydesdorff, 2015; Rahman, Chaudhry, Meo, Sheikh, & Idrees, 2022; Sarwar, Ali, Bhatti, & ur Rehman, 2021). The second part of the bibliometric analysis, science mapping analysis, examines the connections and intellectual exchanges among research constituents (Donthu et al., 2021).

Donthu et al. (2021); Wu, Khan, Yong, Qi, and Wang (2022) permits the identification of the knowledge's dynamic and structural organization for the research topic or problem under consideration (Yue, Ye, & Chen, 2022). According to Donthu et al. (2021)and Mlcochova et al. (2021) Bibliographic analysis is necessary to determine the significance of documents within a dataset with respect to their network location in relation to ongoing or periodic developments of study themes. Coupling studies how publications relate to one another. The concepts these keywords refer to should be closely related to these keywords. Thematic group identification is also possible with this kind of analysis. Economic Intelligence Agency/Economic Research 7.

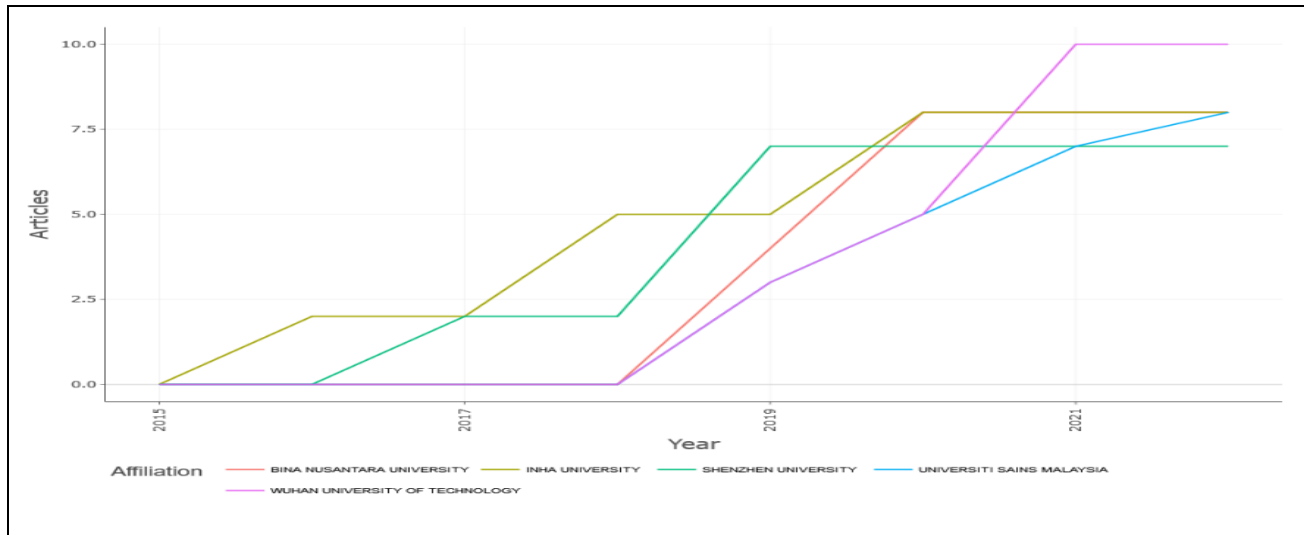


Figure 1: Per Year Production

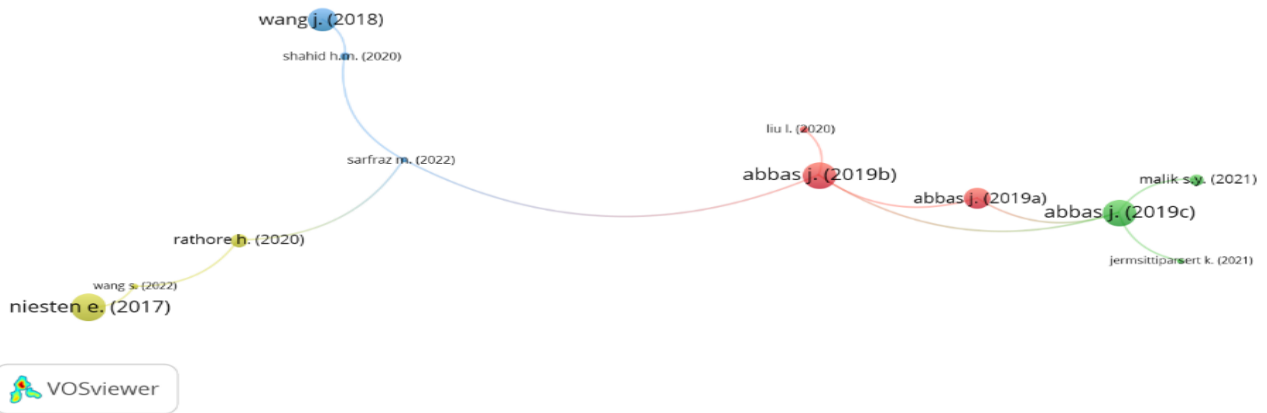


Figure 2: Number of Citation by author

4.2.1.Co Citation by Author

As previously mentioned, assessing the references cited by the scientific publication included in the chosen dataset as well as analyzing the connections between cited articles. Stated differently, co-citation analysis, as highlighted by Ferreira and Serpa (2018), finds publications that are cited in a large number of other papers, suggesting that the cited publications are closely related (Majid, Rasool, Rasool, & Zafar, 2023). For our open access publication sample, and 41.549 cited references were found; 329 cited references satisfied the requirement . The top ten references cited in our 807 selected articles with the most link strength, citations, and connections in the field of SP research are listed in Table 2. Figure shows the cluster density visualization of high-frequency co citation.

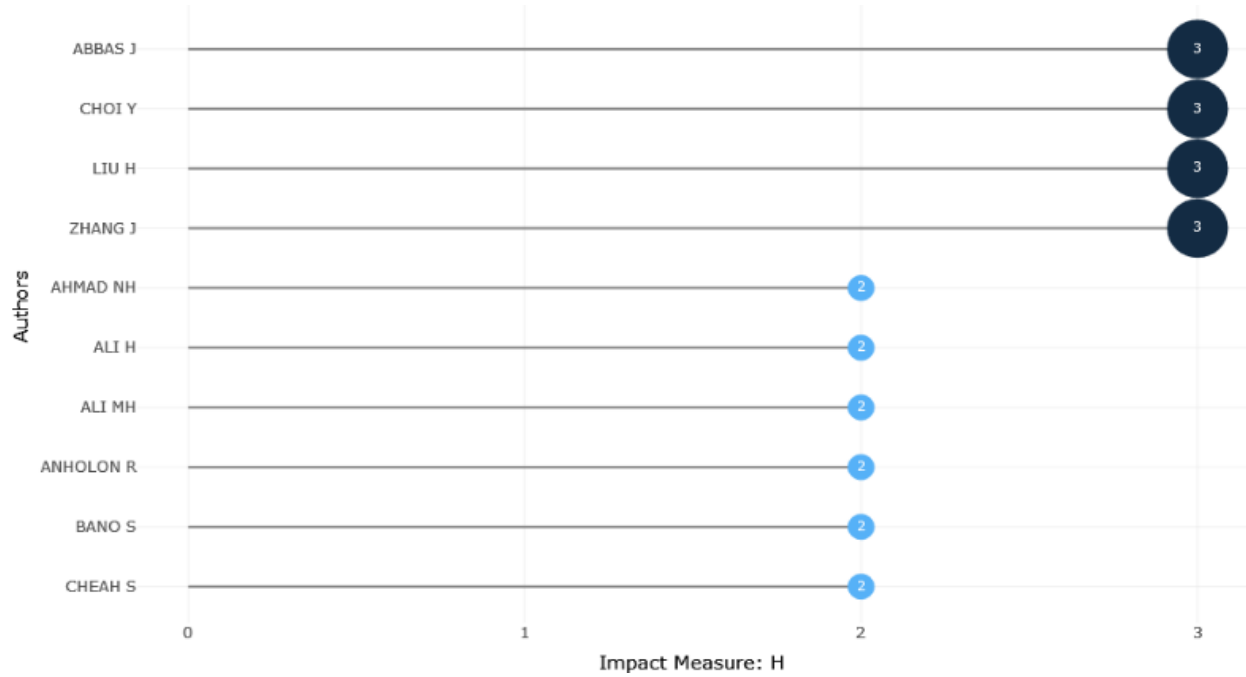


Figure 5: Highly Impact Factor Author

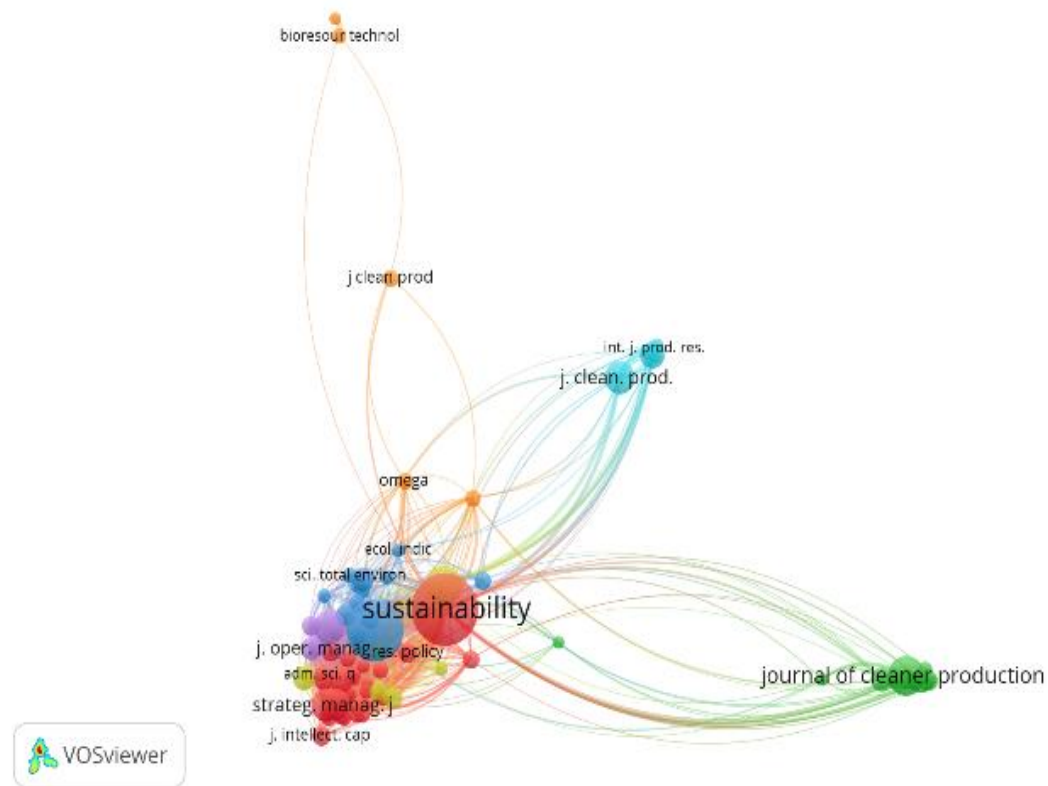


Figure: 6 Co Cited Author by Source



Figure 7: Publisher

A visualization of density is shown in Figure 8. In order to find research inclinations and possibly game-changing innovations in the field of SP, we also employed a different well-known bibliometric software tool (Chen, Zhang, & Fu, 2019). This tool helps academics better understand the state and dynamics of a particular body of knowledge. As noted by other researchers Xu et al. (2021), the researcher needs to take into account the operability and applicability of the bibliometric tool before choosing it. As per the findings of Donthu et al. (2021) and Waqar, Javed, and Rasool (2023) each bibliometric. Coders have advantages and disadvantages. Therefore, in many cases, integrating bibliometric software would be the best course of action for maximizing benefits and counteracting the disadvantages of each program (Donthu et al., 2021; Xu et al., 2021). We decided on VV. To begin with, Vos Viewer is fairly informal to use; no programming experience is required, and setting up the bibliometric analysis parameters is straightforward (Xu et al., 2021). Second, this software offers better mapping capabilities with much easier interpretations, making it very practical to work with large datasets (Donthu et al., 2021).

4.2.2.Co Occurrence

Keyword co-occurrence analysis, The fundamental purpose of this analysis is to be able to identify individual themes and arrange them into thematic clusters, allowing the important theoretical or underlying themes of the subject area to be displayed. In this study, the Keywords Plus tool from Web of Science was used to do keyword research.

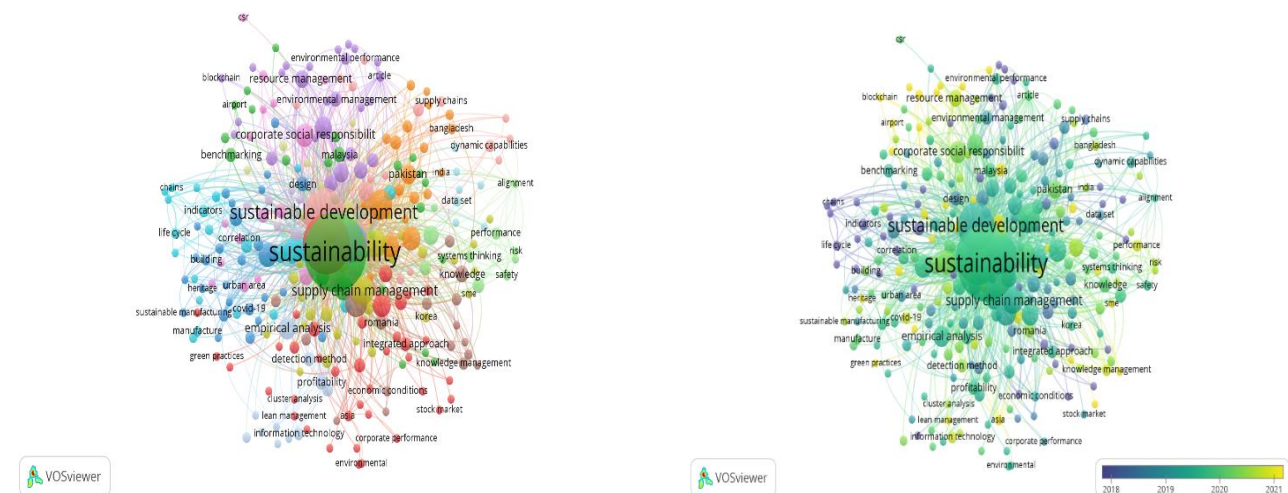


Figure 8: Co Occurance of Aurthor by Networking and Overlay Visualization

The WOS Keywords Plus service is then created automatically by a computer algorithm employing words and phrases that commonly occur together in article references. Some researchers argued that analyzing the knowledge structure of a certain study subject using both Keyword Plus and author keyword phrases would be more complete (Zhang et al., 2016). Using the lowest criterion for keyword occurrence, 130 keywords were discovered from a total of 3255 terms. Sustainability (208 occurrences), innovation (186 occurrences), management (155 occurrences), performance (145 occurrences), and impact (112 occurrences) were therefore the five most often occurring keywords. To foster an understanding of the co-occurrence of keywords by tree map with figure



Figure 9: Co Occurrence Density Visualization

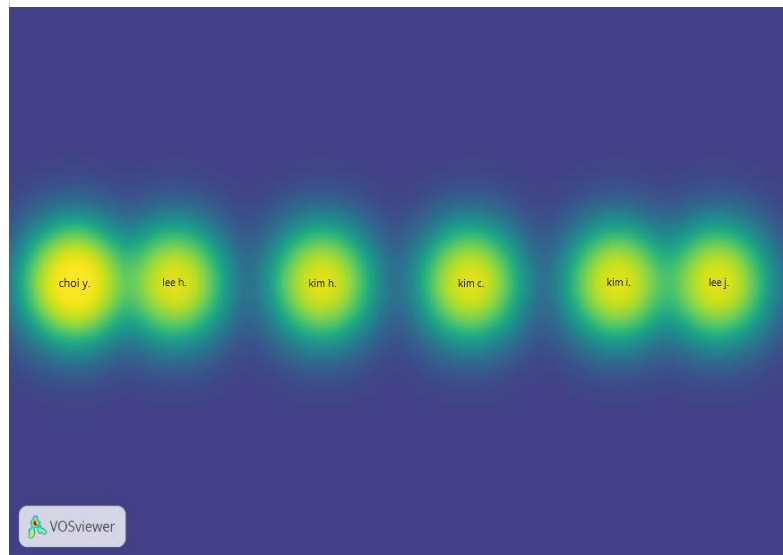


Figure 10: Most Popular Authors by Citations by Using VOS Viewer

4.2.3. Author Based Analysis

Table 2 shows the top 15 authors of the world , who worked on the theme of SP since 2015 to 2022. Table reveals that Abbas J with 3 documents with 186 citation and, Iran Manesh with 3 documents with 70 citation LIU N, with 3 articles and 43 citations, and so on below table show the detail. Graphical representation of the co-authors analysis vividly explains the relevant statistics related to SP. Vertical bars shows the level of citations of top 15 co-authors below table. And diagram.

Table 2:
Top 15 Authors for SP

Sr no	Author	Documents	Citation	Link strength
1	ABBAS J	3	186	16
2	IRAN MANESH	3	70	12
3	LIU N	2	43	12
4	ALI H	3	71	11
5	BANO S	2	140	11
6	NURUNNABI N	2	140	11
7	SONG X	2	87	11
8	WANG Z	3	43	11
9	ZHANG J	2	42	10
10	CHEN Y	2	67	9
11	ZHANG H	2	29	8
12	ANHOLO N	2	34	8
13	KHAN N U	2	19	8
14	LIEL FILO EA	2	34	8
15	LI Q	2	66	8

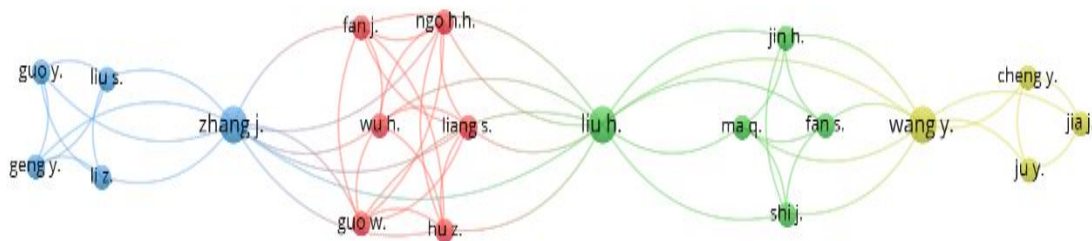


Figure 11: All keyword co-occurrence Analysis trough Cluster Diagram & Word Map

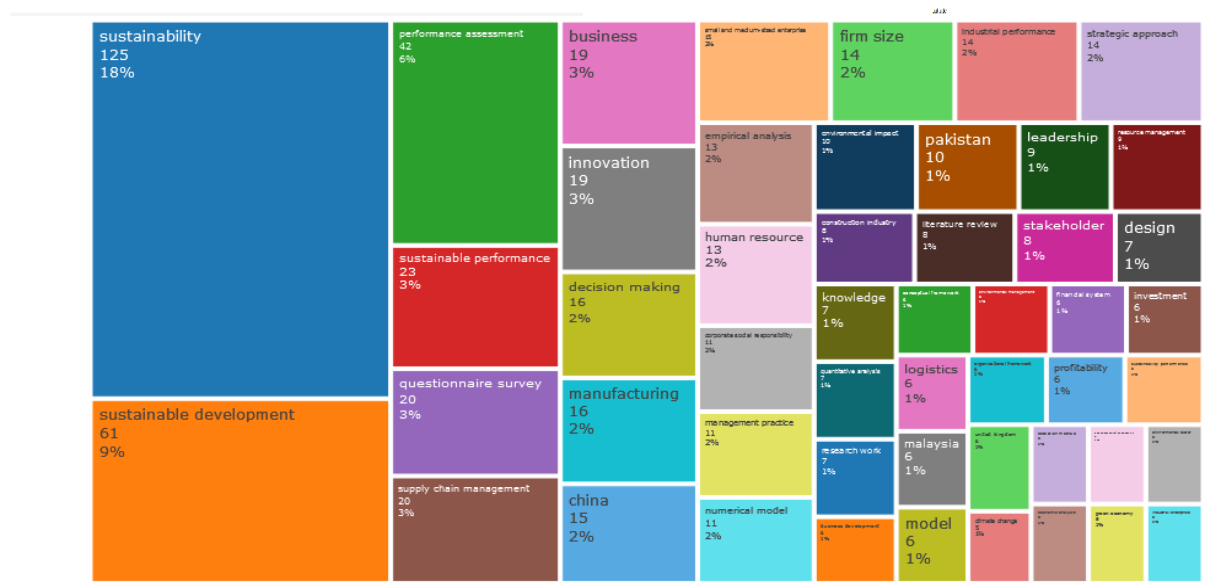
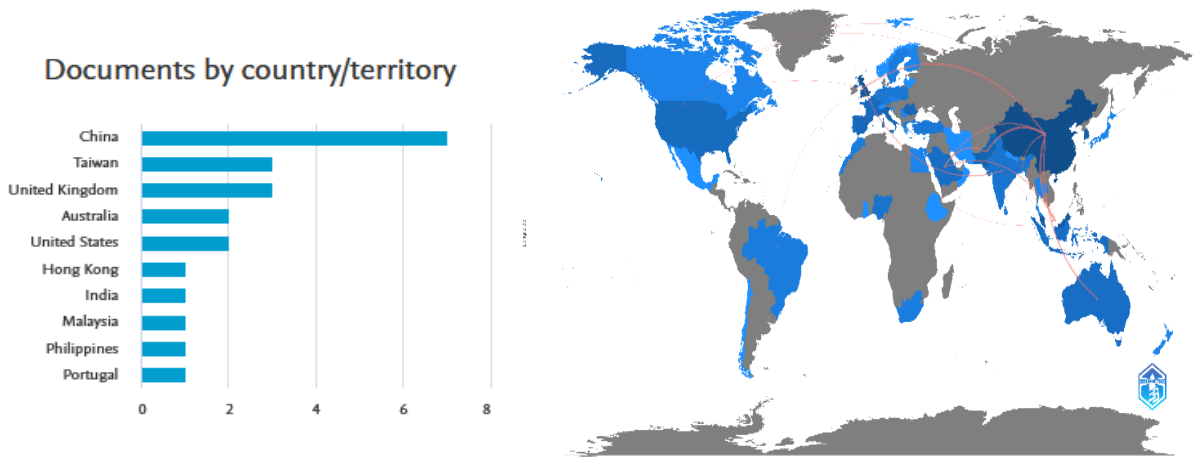
According to Callon, Courtial, Turner, and Bauin (1983), co-word analysis is the very helpful in understanding the structural concept of the topic under discussion. The analysis elaborates that Sustainability, environmental performance, management practice, human training, environmental protection, supply chain management, green economy, leadership, and behavioral research are the most frequently used key words in SP research (Fig.10). While the cluster diagram shows the year vice research topics and trends in SP. China on top , UK, Korea, Malaysia and so on describe in Table 3.

Given that researchers commonly include several keywords, tree map analysis is essential to identifying the intriguing study areas and identifying gaps in the discussion of SP research. Nested rectangles in Fig.11 depicts the key words used in research articles till 2022. The correlation between the keywords is shown by the color intensity and dimension of the rectangles in the tree map diagram. The tree map draws attention to the grouping of likely keywords that refer to business ethics. SP shares the 18% of the share. Environmental management 9%, sustainable development, 6% performance assessment, 7% resource allocation and so on.

Table 2
Top 15 Average Article Citations

Sr no	Country	TC	Average Article Citations
1	CHINA	1066	23.69
2	UNITED KINGDOM	432	28.80
3	KOREA	182	11.38
4	USA	84	21.00
5	MALAYSIA	83	7.55
6	FINLAND	78	78.00
7	FRANCE	51	17.00
8	SAUDI ARABIA	51	25.50
9	ITALY	50	6.25
10	GREECE	46	15.33
11	SINGAPORE	46	23.00
12	SPAIN	46	5.11
13	CZECH REPUBLIC	44	22.00
14	IRAN	43	43.00
15	BRAZIL	37	12.33

Country Collaboration Map



4.2.4.Co Authorship by Journal

The domain of journal of cleaner production is the most influential in the world of co-citation analysis with 36 published articles. It is not been a surprise to discuss that only 3 of

the journals named Sustainability (Switzerland), international journal of man power and corporate social responsibility and environmental management are holding their major portion in this scenario. Fig. 11 shows the contribution of major journals in journal vice co-citation analysis with their number of documents published. While the table 3 below shows the top 20 journals list with their specifications in the field of sustainability.

Table 3
Co-Citation Analysis by Journal

Journals	Documents
Asia pacific journal of human resources	5
Benchmarking	12
Business strategy and the environment	7
Cogent business and management	5
Contemporary developments in green human resource management research: towards sustainability in action?	8
Corporate social responsibility and environmental management	14
Environmental science and pollution research	6
Frontiers in psychology	9
International journal of hospitality management	6
International journal of human resource management	14
International journal of manpower	26
International journal of productivity and performance management	5
International journal of sustainable development and planning	5
Journal of cleaner production	36
Proceedings of the international conference on industrial engineering and operations management	6
Sustainability (Switzerland)	31

It is the need of the hour to identify the deficiencies and cover them up with suitable measures. This could only be possible by raising the standard of research and motivating the researchers to do a realistic and scientific research in the areas, which are under- diagnostics. International standards has been set in this regard to level up the quality research articles. And the term is commonly known as Impact Factor.

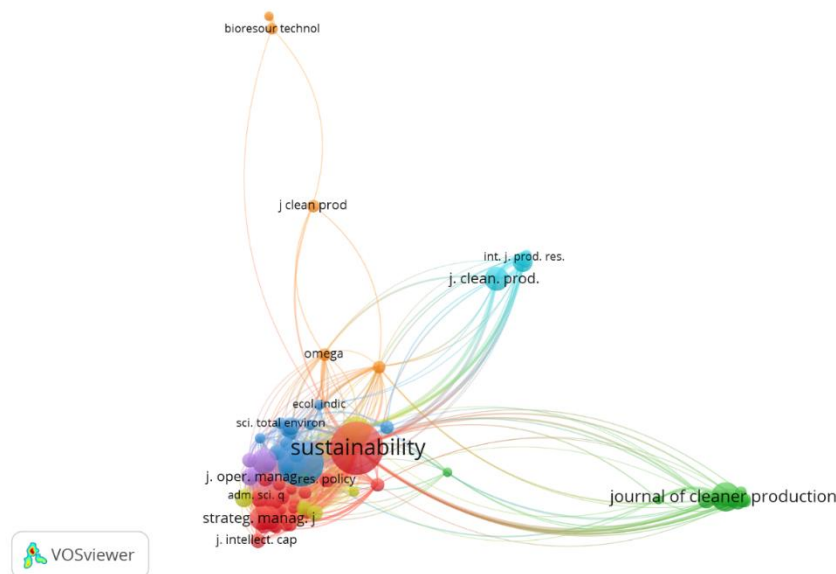
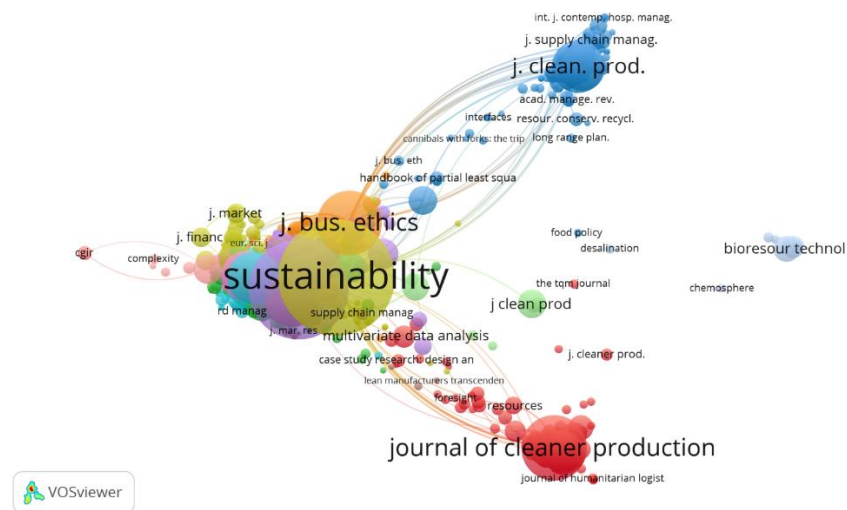


Figure 12: SP of Industries and Business

According to figure 12 we can see the top journal in the field of SP of industries and business, journal of cleaner production on the top of the list by using scopus and Vos viewer we finf this diagram.

Figure 12



4.2.5. Developing Tendencies for Future Investigation

Finding new patterns and potentially revolutionary developments is essential to understanding the body of knowledge related to sp. Scopus and VOS Viewer are two more crucial resources for mapping scientific literature that are used in this way. The primary goal of the Vos document tool, which is grounded on a Scopus for analyzing and visualizing the co-citation network, is to offer an analysis of emerging trends in a particular field of study (Caputo, Pizzi, Pellegrini, & Dabić, 2021). The history, present situation, and potential future directions of the subject of SP are depicted in Figure 8. Diagram overlay displaying the Co-occurrence of keywords. Source created by the author using VOS viewer analysis The burstiness of subject categories, keywords, phrases, and cited references, at different granularities, is a useful indicator of the most active research areas. The temporal burstiness of keyword frequency provides valuable signals about the precise window of time when the number of citations for a given term or keyword suddenly soars (Chen et al., 2019). The results are shown in Figure 1, which groups the top nine terms by burst strength in citation bursts over time. Nine keywords related to SP research received at most attention between 1996 and 2021 (Rasool, Majid, Rasool, & Zafar).

Table 3 displays the observed time intervals as blue of the burstiness phase of the keyword as a red line segment. Table 11 shows that the term "sustainable development" (3,57) had the first burst of citations, and that burst lasted for five years, from 2009 to 2013. Then come "sustainable business" (2010-2016), "climate change" (2010-2012), and "sustainable practices of business " (2010-2017). This makes sense considering that global trends started to emphasize the impact of climate change on sustainable business practices around this time. More focus has been placed on how "social responsibility" (2015–2017) and "corporation of social accountability" (2014–2016) affect the performance of corporate businesses Additionally, the keyword burst pattern suggests that research topics about environmental problems (2017-2019) and supply chain management (2017-2019) have recently become more competitive. The term "environmental performance" is the most recent, with a spike from 2018 to the present, indicating the topic's prominence in recent discussions on SP. Recent years have seen a rise in interest in environmental performance, especially in light of strict guidelines ensuring the essential deliberation of environmental factors but it is the attainment of a suitable threshold for significant environmental performance indicators.

In summary, these themes have produced and will remain to produce significant advances in the field of SP research.

4.2.6.Future Research Agenda

The bibliometric analysis in this study gives a future research agenda and consolidates rising research trend themes on SP in the literature. Several research gaps in this subject remain unmet, despite the growing emphasis in academic and commercial research on SP.

5. Conclusions

As different researchers have stated Miguel et al. (2018) A conceptual framework plan for a certain study subject may be quite beneficial in offering a full picture of the region, making it simple to understand the connections between the majority of the investigated issues, and indicating the critical research that needs to be done. The bibliometric analysis created from different perspectives within this study on journals, articles, and authors provides comprehensive and relevant insights that enable the identification of fundamental characteristics and systematization of the body of knowledge of this popular research field on SP. In light of the bibliometric analysis findings, the most popular challenges, impediments, and future research routes were evaluated, indicating the importance and growing interest of academia and industry in the subject of sustainable development. Because one of the key goals of business model innovation is to produce value, identifying suitable strategies for long-term models is crucial. In addition, the many forms of sustainable business model innovation must be defined. Another important subject that demands for a greater emphasis on the creation of new circular business models to make the business of managing resources and energy that circulate both within and outside the organization easier to handle. Future research agendas for both new and experienced researchers in this field should include a more detailed examination of the relationship between corporate social responsibility and environmental performance in the context of sustainable development, as well as the implementation of green human resource management practices. Future study will also focus on emerging technologies such as Industry 4.0.

More research is needed in this area, such as the role of blockchain technology in promoting SP in a variety of industries, the relationship between big data analytics and sustainable supply chain performance metrics, predictors of SP in the context of emerging countries in a variety of industries, the value of participatory web tools in achieving SP, and the internationalization of big data analytics. Another ongoing concern is the quality of sustainability reporting, where academics should work on giving a more thorough research in order to develop an effective materiality evaluation that will filter the necessary information. Only articles indexed in the Web of Science database were utilized, despite the fact that the Web of Science database generates the highest quality publications and is a reputable source for indexing highly ranked journals (Caputo et al., 2021). Another ongoing concern is the quality of sustainability reporting, where academics should work on giving more thorough research in order to develop an effective materiality evaluation that will filter the necessary information. Only articles indexed in the Web of Science database were utilized, despite the fact that the Web of Science database generates the highest quality publications and is a reputable source for indexing highly ranked journals.

Authors' Contribution

Zainab Javaid: initiated the core idea of performed data analysis and drafting

Amina Ilyas: provided guidance for data analysis, reviewed, supervised

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