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Mapping the Landscape: A Bibliometric Analysis of Global Trends in Sustainable Performance

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ABSTRACT

The study primary objective is to trace the evolution of research on sustainable firm performance. By providing a comprehensive overview of key trends and developments in this field, the study seeks to contribute to the existing body of literature and offer valuable insights into the progression of sustainable performance research. A bibliometric analysis was conducted using selected publications from the web of science core collection (WoSCC) database, covering the period from 2010 to 2024. VOSviewer software was employed to perform the analysis. The findings of this study present several important implications. It highlights the evolution of sustainability-related literature across various academic journals and identifies the most pertinent topics concerning firm sustainable performance. The study also identifies the most frequently cited papers and outlines potential areas for future research. Notably, the analysis reveals a literature gap in the assessment of firms' social and environmental performance, suggesting that this area warrants further scholarly attention in the coming years. Additionally, the study emphasizes the need for enhanced collaboration between academia and industry to bridge the gap between research and practical application.

Keywords: Green Innovation, Corporate Social Responsibility, Environmental Performance, Sustainable Development, Sustainable Firm Performance
JEL Classifications: F64, M10, M14

1. INTRODUCTION

The growing consensus of environmental humiliation has increasingly gained massive academic sight. The unprecedented challenges, such as climate change, globalization, poverty, poor infrastructure, and inadequate resources, have raised public concerns about biodiversity and sustainability (Yi et al., 2023). This increasing environmental worry has turned organizations toward gaining sustainable performance. In 2015, the United Nations (UN) presented a framework for implementing 17 goals and 169 targets for sustainable development (United Nations, 2015). These sustainable development goals demonstrated the role of corporations in ensuring environmental welfare and societal well-being. Today, these goals have made the firms integrate sustainability goals into their mission. Sustainable performance is currently a hot topic in solving socio-ecological challenges. It is described as the integration of a firm's environmental, social, and economic efforts in the business functions (Henri and Journeault, 2008).

In the academic context, Le (2022) advise that a sustainable form of CSR benefits its stakeholders by protecting the environment (Kraus et al., 2020) and simultaneously contributing to social well-being (Flammer et al., 2019) and green innovation (Chang, 2015; Yuan and Cao, 2022; Yuan et al., 2023). This concept does not only show a desire to form a good image or to maximize profit, but it is a transparent approach to ensuring the company's sustainable outcomes. It is a competitive coherence of incorporating ethical activities in firms that add value to society beyond the statutory guidelines. Another perspective is that the

firms exhibit the economic, ecological, and social commitment (Rodríguez-García et al., 2023) towards meeting the stakeholder expectations. Particularly, this phenomenon is relevant to fulfill the consumer's desire for green purchasing (Khan et al., 2023) and activities (Hameed et al., 2022; Shahzad et al., 2020). As a result, today's companies are adopting green products and processes for gaining sustainable performance (Shahzad et al., 2022; Shahzad et al., 2020b) and competitive advantage (Tariq et al., 2017; Zhang et al., 2020). This strategic agenda enables the organization to ensure its ecological actions towards firm's value (Khanra et al., 2022), sustainable performance, sustainable development, corporate social responsibility, environmental performance, and corporate governance.

Sustainable performance leads firms to achieve sustainable development goals not only on micro but also on macro levels. Towards the European Union's green deal, the companies are achieving sustainable performance to create optimal job opportunities, innovation, and prosperity for citizens and territories (Terzic, 2022). It is critical to know that sustainable performance varies across different regions and industries depending on the economic structure, regulatory environment, and resource availability. For example, in developed countries like the U.S.A, China, and Europe, companies are making significant efforts towards adhering to the regulations and customer demand for environmental performance (Nguyen et al., 2023). However, in emerging markets like India, Bangladesh, Indonesia, and Pakistan, firms are catching up due to industrialization and climate change (Sarfraz et al., 2022). Similarly, industries such as manufacturing (Du and Wang, 2022), Logistics (Zahoor et al., 2023), hospitability (Langgat et al., 2023), and Tourism (Ashraf et al., 2024 and Hasana et al., 2022) are notably embracing renewable energy practices. For example, in manufacturing companies of developed countries such as China., energy efficiency is increasing (Alam et al., 2023), whereas industries such as construction (Waqar et al., 2023) and pharmaceutical (Shoukat et al., 2023) of developing countries- Pakistan and Malaysia are facing sustainability challenges due to limited technological adoption. With this, Alagoz (2023) reveals that the oil and gas sector, particularly in the Middle East, has also gained success in achieving sustainable performance metrics. In Bangladesh and India, the banking and finance sector is increasingly gaining growth in sustainable financing through green bonds and ESG investments (Rahman et al., 2023).

Nonetheless, there is still some gap that needs to be addressed in every field and industry. In the last few years, COVID-19 has wreaked havoc on the world's major countries and industries, increasing the quest for sustainable practices and governance (Nadkarni et al., 2023). COVID-19 impacted global industries to experience growing environmental challenges (Sarfraz et al., 2020). This made the firms look into green innovation (Braga and Ernst, 2023), environmental sustainability (Langgat et al., 2023), CSR (Gao and Yang, 2023), etc., to ensure sustainable performance. Therefore, with all the above issues, there is a need to gain a holistic overview of the sustainability situation (Sarfraz et al., 2023). This study intends to review sustainable performance. In doing so, diverse publications related to this topic are considered in different industries and countries.

Many publications related to sustainable performance are available in the form of journals, proceedings, news articles, reports, etc. The number of scientific publications on this topic has increased over time. The literature broadly discusses the emerging trends. This effort to document the evolution of this research in the last 14 years (2010–2024) is a niche area that can be explored in the future setting. The current study highlights the academic interest in sustainable performance and the underlying factors that influence it. By presenting bibliometric metric analysis, the current study contributes to the literature on sustainable performance.

Based on the rising trend in academics, this field has grown respectively. To the best of our knowledge, there has been no systematic review that covers these questions with regard to the sustainable group clusters. This work offers both theoretical and practical contributions. This study helps identify the research areas in sustainability that have previously remained underexplored, offering future scholars the opportunity to focus on these areas. By highlighting different trends, citation patterns, and clusters, the study sets a clearer understanding of the key topics of green innovation, corporate social responsibility, etc. Mapping the contributions in academia, the study analysis allows researchers to develop a consolidated theoretical framework, refining the conceptual understanding of sustainability and its practical applications. This bibliometric analysis emphasizes addressing the stakeholder's concerns. Such as this study enables corporations to gain insight from the analysis and understand the trends in sustainability. This knowledge can help them shape long-term strategies and align with their emerging priorities of sustainability and innovation. With that, by highlighting the key research trends in innovation, corporations can identify the opportunities that are economically beneficial. Hence, in this way, this bibliometric analysis will be beneficial for corporations, industrial professionals, practitioners, policymakers, future researchers, scholars, and academic writers. As the study provides a holistic overview of the current topic, it is a valuable work that includes diverse perspectives and thus is an excellent initiative for future investigations. As compared to past study (Rao and Shukla, 2023), it provides a systematic mapping of the historical reviews and presents a broader research domain, which sets it apart from the other studies.

The paper systematically presents details of the analysis. The methodology section elaborates on the data collected and the software used. Then, the statistical analysis/results and discussion section presents the evolution trends of the field. Finally, the last section concludes the research findings and outlines the limitations and future research directions.

2. METHODOLOGY

The bibliometric analysis uses both qualitative and quantitative strategical methods to analyze the documents, such as journals, proceedings, reports, etc. In this study, the bibliometric method explores the evolution of academic knowledge, particularly in the context of sustainable performance. In keeping this in mind, this study poses the following questions:

RQ1: What are the publication trends in sustainable performance over the last 14 years (2010–2024)?
RQ2: How do the leading publishers, institutions, and countries, and keywords contribute to this topic?
RQ3: Which are the most productive and influential authors and journals publishing on sustainable performance?
RQ5: What are the global clusters and themes concerning sustainable performance?

This study uses VOSviewer software to visualize and analyze the trends and scientific literature based on the ISI Web of Science Social Science Citation Index (WoSCC/SSCI). WoSCC/SSCI allowed us to discover the critical points in the development of the topic while understanding and interpreting the topic's historical patterns. Figure 1 illustrates the flowchart retrieved from the Web of Science Core Collection database on September 14, 2024. The literature search includes the following topics:

"Sustainable Firm Performance*" OR "Sustainable Organisation* Performance*" OR "Corporate Sustainability*" OR "CSR" OR "Sustainable Business Practice*" OR "Environ* Social* and Govern*" OR "ESG Performance*" OR "ESG" OR "Sustainably* Firm Growth*" AND "Business Performance*" OR "Ethic*" OR "Ethic* Investment*" AND "Green Innovation*").

3. RESULTS

3.1. Documents Profiles, Publication Trends and Publishers

A total of 250 documents have been identified in the search, which includes various forms of scholarly output such as journal articles, conference proceedings, and editorials. The selection encompasses multiple areas of research, ranging from corporate social responsibility (CSR), environmental, social, and governance (ESG) performance, to green innovation and sustainable business practices. The documents reflect an interdisciplinary approach that integrates sustainability with business performance and ethical investments.

The majority of the publications come from leading academic publishers, including Springer, Elsevier, Taylor and Francis, Wiley, and SAGE Publications. Journals indexed in SCI-EXPANDED and SSCI, particularly in the fields of business, management, environmental science, and sustainability, dominate the publication landscape. These include highly ranked journals such as the Journal of Business Ethics, Corporate Social Responsibility and Environmental Management, and Business Strategy and the Environment.

Figure 1: Bibliometric Analyses Keywords

Database: Web of Science Core Collection (WoSCC)
Data extraction date: September 14, 2024
TS= ("Sustainable Firm Performance*" OR "Sustainable Organi?ation* Performance*" OR "Corporate Sustainabilit*" OR "CSR" OR "Sustainable Business Practice*" OR "Environ* Soc* and Govern* OR "ESG Performance*" OR "ESG" OR "Sustainabl* Firm Growth*" AND "Business Performance*" OR "Ethic*" OR "Ethic* Investment* AND "Green Innovation*")
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI
Timespan=All years (2010–2024)
N=250
Bibliometric analyses
Document type Citation
Language Keyword co-occurrence
Publication trend Bibliographic coupling
Publisher
Software: VOS viewer (Version 1.6.20) (Van Eck & Waltman, 2020)

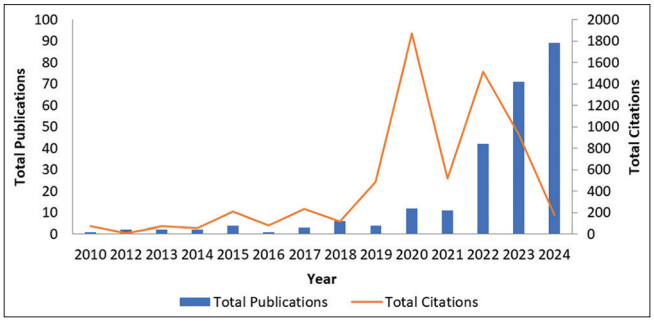
Figure 2 reflects on RQ1 and shows the publication trend for the last 14 years (2010-2024). It showcases the trends in sustainable performance research. It illustrates the total number of publications and citations per year. The first publication and citation were recorded in 2010. It demonstrated that between 2010 and 2018, the publications were infrequent, and the citation rate was modest, reflecting a gradual growth in sustainable performance research. From 2019 onwards, a noticeable increase in publications is observed, reaching the highest in 2024 with over 90 publications. Also, it reports the highest citation in 2020 (i.e., 90). It may be due to the prolonged effect of the pandemic that the trend in citations increased in 2020. Devi and Srivastava (2023) argue that researchers must devote more attention to sustainable performance by developing post-pandemic strategies to gain sustainability. With that, the citations showed relatively slower growth in 2021 and 2022. A major decline was observed after 2022. This pattern suggests that the current academia focuses more on publications. The statistics highlight the growing importance and fluctuations in various sectors, such as manufacturing, textile, healthcare, etc. The drop-in citations in 2022 could indicate that the number of citations in the publishing journals may be due to differences in the nature of fields, interdisciplinary challenges, regional focus, and evolving methodologies. Sustainable performance is an evolving area of study, but initially, scholars may not realize the importance of this field as a standalone research focus, leading to fewer citations, whereas the steady rise in publications in 2024 exhibits the field maturity and interest in sustainable performance. This establishment opens the doors for the researchers to discover and explore the frameworks related to sustainable performance.

Table 1 represents the list of top 10 publishers in the sustainability area. The top three publishers are MDPI (18.80%), Emerald Group Publishing Ltd (14.40%), and Wiley (14.00%).

3.2. Citation Analysis

The research also presents evidence for citation analysis. It illustrates the most cited articles, the most productive journals,

Figure 2: Publication trends in the Sustainability, 2010–2024



Source: 2024 refers to September 14, 2024

and the most influential authors. The citation analysis is the way to measure the significance of the author's or article's publication. It can be computed by the frequency of the author's work cited by other writers (Appio et al., 2014).

Table 2 demonstrates the top 20 most cited papers regarding sustainable performance. The most cited paper was published in 2020, with 533 citations, focused on corporate social responsibility and environmental performance (Kraus et al., 2020), followed by a study that focused on corporate environmental responsibility engagement and firm value (Li et al., 2020) with 265 citations. Papers ranked third and fourth discussed the role of green innovation concerning sustainable performance (Shahzad et al., 2020) and environmental sustainability (Shahzad et al., 2020), respectively. Similarly, the rest of the papers focus on topics such as corporate governance, CSR, technology, environmental readiness, etc.

3.3. Co-occurrence of Author

Supporting RQ2, Co-occurrence is the frequency by which the text appears, such as graphic visualization (Baker et al., 2020). In the sustainable performance field, the keywords play a vital role in searching the publication. Keyword reflects the niche areas through which help to record the relevant data. The high-frequency keywords are green innovation, corporate social responsibility, corporate sustainability, and sustainability. The keywords are illustrated in Table 3.

Furthermore, supporting RQ2, Table 4 illustrates the most productive countries that have the most research done on sustainable performance. China, Pakistan, and Malaysia are the top three countries with the highest publications, which are 153,36, and 20, respectively. These countries are followed by England and Spain with 20 and 15 publications. Further, the most productive nations with the highest number of citations are China, Pakistan, and England, with 3911, 1768, and 1247, respectively.

Table 1: Top 20 publishers with the highest publication records

Rank	Publishers	Publications (n=250)	%
1	MDPI	47	18.80
2	Emerald Group Publishing Ltd	36	14.40
3	Wiley	35	14.00
4	Springer	15	6.00
5	Elsevier Sci Ltd	13	5.20
6	Routledge Journals, Taylor and Francis Ltd	13	5.20
7	Springer Heidelberg	12	4.80
8	Elsevier Science Inc	10	4.00
9	Cell Press	8	3.20
10	Elsevier	7	2.80
11	Academic Press Inc Elsevier Science	5	2.00
12	Frontiers Media Sa	4	1.60
13	Springer nature	4	1.60
14	Sage Publications Inc	4	1.60
15	Academic Press Ltd- Elsevier Science Ltd	3	1.20
16	Public Library Science	3	1.20
17	Pergamon-Elsevier Science Ltd	3	1.20
18	IGI Global	3	1.20
19	IEEE	2	0.80
20	Taylor and Francis Ltd	2	0.80
	Others	21	8.40

The most productive and impactful journals in the field of sustainability are demonstrated in Table 5 (RQ3). The terms influential and impactful are distinct. The word influential refers to the work that significantly shapes and directs the field. It can be measured by the citation count, which means the number of publications refereed by others. For example, a paper cited across different disciplines is considered influential if it guides the way the research is conducted. On the other hand, the word impactful refers to the practical and theoretical effects of the research on the field, society, industry, etc. Impact refers to the broader application of sustainability practices. The most productive journal with the highest number of publications is sustainability (i.e., 40), followed by corporate social responsibility and environment management (15 publications) and business strategy and the environment (12 publications). In addition, the most influential journal with the highest citation is business strategy and the environment (i.e., 769 citations), followed by journal of cleaner production with 747 citations, and technological forecasting and social change journal with 596 citations.

Further, the analysis explores the most influential authors contributing to the literature on sustainable performance, i.e., RQ3. Table 6 presents the classifications formed based on the ranking and number of citations. Productive refers to the number of publications. It measures the number of qualities rather than quality. On the other hand, influential means research that shapes or contributes to the field. Influence is about quality and relevance but not always necessarily about the count. For example, a highly cited paper is influential and may remain theoretically relevant without practical, limiting the real-world impact. Similarly, the less cited study may lead to more significant changes in society, thus making it impactful. The most productive authors securing the first and second positions with 4 publications were Bartolome Macro-Lajara and Mohsin Shahzad. Along with them, Jun Sun, Zhaojun Yang, and Yali Zhang secured third, fourth, and fifth rankings, respectively. Concerning citations, Mohsin Shahzad is ranked first with 584 citations, followed by Ying Qu second, Saif Ur Rehman third, and Abaid Ullah Zafar fourth, with 574 citations.

The development of sustainable performance research is supported by various global institutions. The bibliometric analysis enables us to gain information on the author's affiliations. Table 7 based on RQ3 shows that the top three most productive institutions based on publications are Jiangsu University (7 publications), followed by Northwestern Polytechnical University (7 publications), and Xi'an Jiaotong University (6 publications). The Chinese government heavily invests in research and development (Xu et al., 2021) by allocating considerable resources to universities and research institutions. Because of this, China is among the top countries in academic research (Hyland, 2023). Sustainability and innovation are priorities in China, and research institutions are encouraged to publish high-impact publications. With that, the strong governmental support of the universities in China has

Table 2: Top 20 most-cited papers

Rank	Article title	Author full names	Publication year	Publisher	Times citations	Average citations per year	Theory	Results
1	Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation	Kraus et al.	2020	Elsevier Science Inc	533	133.25	Natural resource based theory	CSR does not directly influence EP but is positively related to ES and GI, which mediates the relationship
2	Does corporate environmental responsibility engagement affect firm value? The mediating role of corporate innovation	Li et al.	2020	Wiley	265	66.25	Stakeholder Theory, Resource Based Theory, and Voluntary Disclosure Theory	CER negatively influences the firm's value, where corporate innovation mediates the relationship
3	Exploring the influence of knowledge management process on corporate sustainable performance through green innovation	Shahzad et al.	2020	Emerald Group Publishing Ltd	261	65.25	Resource based view	KMP leads to GI, which influences SP. GI mediates the relationships
4	Relation of environment sustainability to CSR and green innovation: A case of Pakistani manufacturing industry	Shahzad et al.	2020	Elsevier Sci Ltd	247	61.75	Theory of sustainable development	CSR to environment is positively associated, while CSR to consumer has a weaker impact on ESD
5	Corporate governance and the rise of integrating corporate social responsibility criteria in executive compensation: Effectiveness and implications for firm outcomes	Flammer et al.	2019	Wiley	230	46.00	Agency theory	CSR increases the firm's value in the long term, fosters social and environmental initiatives, reduces emissions, and enhances green innovations
6	Critical success factors of green innovation: Technology, organization and environment readiness	Zhang et al.	2020	Elsevier Sci Ltd	213	53.25	Innovation diffusion theory (technology organization environment framework)	GI leads to competitive advantage through the mediation of environmental and firm performance
7	Do corporate social responsibility practices contribute to green innovation? The mediating role of green dynamic capability	Yuan et al.	2022	Elsevier Sci Ltd	196	98.00	Dynamic capability theory	CSR positively influence GI (i.e., product and process)
8	Social sustainable supplier evaluation and selection: A group decision-support approach	Bai et al.	2019	Taylor and Francis Ltd	181	36.20	Prospect theory (TODIM) and grey system theory	Social sustainability attributes decision framework
9	Drivers and consequences of green product and process innovation: A systematic review, conceptual framework, and future outlook	Tariq et al.	2017	Elsevier Sci Ltd	179	25.57	Resource based theory, institutional theory, stakeholder theory	The drivers of GI (i.e., product and process) have positive consequences on performance and competitive advantage
10	A resource-based view of green innovation as a strategic firm resource: Present status and future directions	Khanra et al.	2022	Wiley	133	66.50	Resource based theory	GI is identified as a strategic resource
11	Corporate social responsibility performance and green innovation: Evidence from China	Hao et al.	2022	Academic Press Inc Elsevier Science	127	63.50		CSR has a positive effect on GI

(Contd...)

Table 2: ***(Continued)***

Rank	Article title	Author full names	Publication year	Publisher	Times citations	Average citations per year	Theory	Results
12	R and D investment, ESG performance and green innovation performance: evidence from China	Xu et al.	2021	Emerald Group Publishing Ltd	114	38.00	Stakeholder theory	R and D investment positively influences GI, and ESG moderates the relationship
13	Corporate social responsibility and high-quality development: Do green innovation, environmental investment and corporate governance matter?	Xue et al.	2022	Routledge Journals, Taylor and Francis Ltd	106	53.00		CSR significantly improves corporate development quality
14	Corporate social responsibility, green innovation and competitiveness - causality in manufacturing	Padilla-Lozano and Collazzo	2022	Emerald Group Publishing Ltd	97	48.50	Stakeholder theory	CSR and GI increases the manufacturing competitiveness
15	Environmental innovations and internationalization: theory and practices	Chiarvesio et al.	2015	Wiley	91	10.11		Firms' geography positively relates to green strategies and influences innovation activities
16	How do ESG affect the spillover of green innovation among peer firms? Mechanism discussion and performance study	Li et al.	2023	Elsevier Science Inc	87	87.00		ESG leads to green innovation and sustainable performance
17	Green capabilities, green purchasing, and triple bottom line performance: Leading toward environmental sustainability	Khan et al.	2023	Wiley	85	85.00	Resource based view	GC positively correlates to purchasing habits, and green buying strategies lead to TBL performance
18	Global sustainability megaforces in shaping the future of the European pulp and paper industry towards a bio economy	Patari et al.	2016	Elsevier Science BV	82	10.25	Resource based theory	Sustainability mega forces are a part of the European PPI business strategy and the future competitiveness of PPI
19	Proactive and reactive corporate social responsibility: Antecedent and consequence	Chang	2015	Emerald Group Publishing Limited	82	9.11	Stakeholder theory and resource based theory	Green organizational culture positively influences CSR and GPI performance, where CSR mediates this relationship
20	How do corporate social responsibility and green innovation transform corporate green strategy into sustainable firm performance?	Le	2022	Elsevier Sci Ltd	81	40.50	Stakeholder theory, resource based theory, and legitimacy theory	CSR and GI partially mediate the relationship between GS and SP.

The citation threshold of a document was set to 15 producing 85 documents

equipped the institutions with cutting-edge facilities, enabling the publication of high-quality research (Zhou and Wang, 2023). Nonetheless, the most influential institutions based on citations are Dalian University of Technology, Ilma University, and Durham University, with 765, 688, and 606 citations, respectively.

The research hotspots are grouped into different clusters, which are represented in (Figure 3a). The recent cluster is represented by red color, followed by green, and the third and fourth in blue and yellow colors, correspondingly. The evolution of the research on sustainable performance has been recorded in academic research.

Table 3: Co-occurrence of author keywords

Rank	Keyword	Occurrences	TLS
1	Green innovation	122	137
2	Corporate social responsibility	70	80
3	Corporate sustainability	26	29
4	Sustainability	23	23
5	CSR	20	22
6	Environmental performance	15	23
7	Sustainable development	15	22
8	ESG	14	20
9	Firm performance	10	13
10	Green innovation performance	9	6
11	Innovation	9	12
12	Sustainable performance	7	11
13	Corporate environmental responsibility	6	8
14	Sustainable business performance	6	8
15	Bibliometric analysis	5	6
16	China	5	4
17	Corporate governance	5	7
18	Corporate social responsibility	5	2
19	Eco-Innovation	5	9
20	Environmental sustainability	5	5
21	Financing constraints	5	7
22	Green finance	5	11
23	Green process innovation	5	4
24	Manufacturing industry	5	9

TLS: Total link strength, a keyword frequency threshold of 5 and this produced a total of 24 keyword

The bibliometric analysis supports the formation of network visualization software, which ranges from entirely friendly user graphical interfaces such as VoSviewer (van Eck and Waltman, 2010).

(Figure 3b) explains colors vary from blue (the oldest years [2021]) to yellow (the recent years [2023]). Analysis of the overlaying visualization, it is noted that the field of studies on sustainable performance has evolved, with corporate sustainability, sustainability, and innovation identified in the oldest years to a more sustainable model of sustainable performance and environmental social governance.

3.4. Cluster Analysis

Clustering is an enrichment technique that is useful for understanding the field research. Table 8 represents the cluster analysis, where clusters are formed based on thematic analysis.

Cluster analysis– bibliographic coupling is presented in Table 8. The clusters are developed by systematically examining shared patterns in the publication data. Clustering analysis explains the most cited articles related to sustainable performance. The first cluster refers to Corporate Social Responsibility, Environmental Social Governance, and Green Innovation. For example, the CSR-ESG-Green initiatives are grouped by analysis of the citations, keywords, co-occurrence, and themes (RQ5). The most influential authors are Li, Flammer, and Hao, who focus on these themes, and their studies were acknowledged in the top journals such as Business Strategy and Environment, Strategic Management Journal, and Finance Research Letters, respectively, with a significant number of citations. The cluster indicates the academic interest in understanding the same theme. Other clusters formed during the analysis are CSR, Green Innovation, and environmental Performance, Green Innovation, CSR, and competitive Sustainability, and CSR, Green Innovation, and Sustainable Development. All these clusters represent a broad spectrum of knowledge in sustainable performance.

Table 4: Top 20 most productive and most influential countries

Rank	Country	Publications	Rank	Country	Citations
1	China	153	1	China	3911
2	Pakistan	36	2	Pakistan	1768
3	Malaysia	20	3	England	1247
4	England	15	4	USA	886
5	Spain	15	5	Spain	680
6	USA	14	6	Malaysia	355
7	Australia	10	7	Australia	256
8	India	10	8	Taiwan	249
9	Italy	9	9	Thailand	248
10	Taiwan	9	10	Italy	224
11	France	7	11	India	215
12	South Korea	7	12	Norway	210
13	United Arab Emirates	7	13	Ghana	188
14	Turkiye	6	14	South Korea	165
15	Saudi Arabia	5	15	South Africa	142
16	Thailand	5	16	Finland	124
17	Tunisia	5	17	Vietnam	121
18	Netherlands	4	18	United Arab Emirates	106
19	Oman	4	19	Austria	98
20	Austria	3	20	Ecuador	98

The document threshold and citation threshold of a country were set as 2 and 5, respectively. This resulted in 40 countries

Table 5: Top 20 most productive and most influential journals

Rank	Journal	Publications	Rank	Journal	Citations
1	Sustainability	40	1	Business strategy and the environment	769
2	Corporate social responsibility and environmental management	15	2	Journal of cleaner production	747
3	Business strategy and the environment	12	3	Technological forecasting and social change	596
4	Environment development and sustainability	11	4	Sustainability	476
5	Environmental science and pollution research	11	5	Technology in society	375
6	Journal of cleaner production	9	6	Journal of knowledge management	269
7	Heliyon	8	7	Corporate social responsibility and environmental management	205
8	Technological forecasting and social change	5	8	Environmental science and pollution research	197
9	Finance research letters	4	9	Kybernetes	136
10	Management decision	4	10	Finance research letters	135
11	Economic research-Ekonomska Istrazivanja	3	11	Economic research-Ekonomska Istrazivanja	101
12	Frontiers in psychology	3	12	Journal of business research	97
13	International journal of environmental research and public health	3	13	Management decision	96
14	Journal of environmental management	3	14	Environment development and sustainability	86
15	Social responsibility journal	3	15	International journal of environmental research and public health	67
16	British food journal	2	16	British food journal	54
17	Computers and industrial engineering	2	17	IEEE transactions on engineering management	43
18	Humanities and social sciences communications	2	18	Journal of business ethics	43
19	IEEE transactions on engineering management	2	19	International review of economics and finance	33
20	International journal of emerging markets	2	20	Journal of environmental management	31

The document and citation thresholds of a source were set to 2 and 5, respectively. This resulted in 30

Figure 3: (a) Visualisation maps co-occurrence of author keywords (Network visualisation map) and Overlay visualisation map (b) visualisation maps co-occurrence of author keywords (overlay visualisation map)

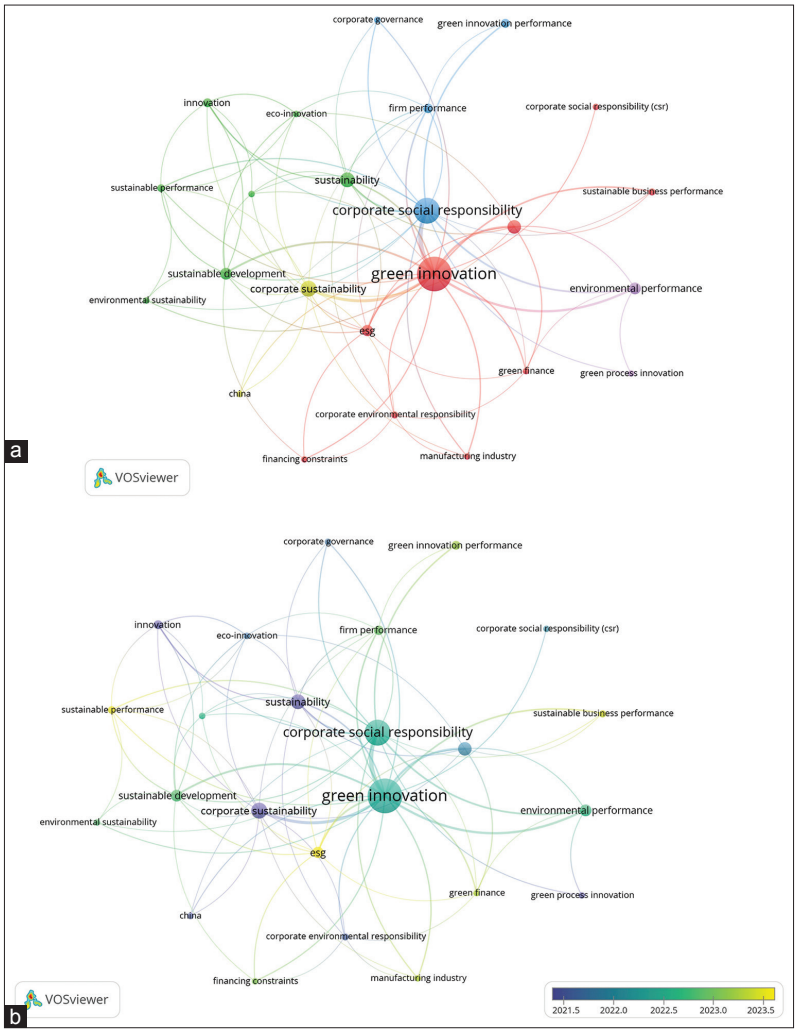


Table 6: Top 20 most productive and most influential authors

Rank	Author	Publications	Rank	Author	Citations
1	Marco-Lajara, Bartolome	4	1	Shahzad, Mohsin	584
2	Shahzad, Mohsin	4	2	Qu, Ying	574
3	Sun, Jun	4	3	Rehman, Saif Ur	574
4	Yang, Zhaojun	4	4	Zafar, Abaid Ullah	574
5	Zhang, Yali	4	5	Rehman, Shafique Ur	540
6	Jamil, Khalid	3	6	Sun, Jun	326
7	Khan, Syed Abdul Rehman	3	7	Yang, Zhaojun	326
8	Martinez-Falco, Javier	3	8	Zhang, Yali	326
9	Naveed, Khwaja	3	9	Wang, Ying	300
10	Qu, Ying	3	10	Albitar, Khaldoon	287
11	Rehman, Saif Ur	3	11	Khan, Syed Abdul Rehman	165
12	Sun, Ziyuan	3	12	Hao, Jing	129
13	Wang, Wei	3	13	He, Feng	129
14	Wang, Ying	3	14	Le, Thanh Tiep	121
15	Zafar, Abaid Ullah	3	15	Johl, Satirenjit Kaur	110
16	Abbas, Jawad	2	16	Khan, Parvez Alam	110
17	Adu-Yeboah, Stephen Sarfo	2	17	Wu, Haitao	108
18	Albitar, Khaldoon	2	18	Xue, Yan	108
19	Asiedu, Deborah	2	19	Collazzo, Pablo	98
20	Azam, Tamoor	2	20	Sarfraz, Muddassar	74

The document threshold and citation threshold of an author were set as 2 and 5, respectively. This resulted 48 authors

Table 7: Top 20 most productive and most influential institutions based on author affiliations

Rank	Institution full name	Country	Publications	Rank	Institution full name	Country	Citations
1	Jiangsu University	China	7	1	Dalian University of Technology	China	765
2	Northwestern Polytechnical University	China	7	2	Ilma University	Pakistan	688
3	Xi'an Jiaotong University	China	6	3	Durham University	United Kingdom	606
4	Dalian University of Technology	China	5	4	Lahore Garrison University	Pakistan	585
5	University of Electronic Science and Technology of China	China	5	5	University of Portsmouth	United Kingdom	578
6	University of Portsmouth	United Kingdom	5	6	Northwestern Polytechnical University	China	394
7	Beijing University of Technology	China	4	7	Hunan University	China	374
8	Central South University	China	4	8	The University of Texas Rio Grande Valley	United States	326
9	Dongbei University of Finance and Economics	China	4	9	Xidian University	China	326
10	Ilma University	Pakistan	4	10	Tongji University	China	317
11	Lahore Garrison University	Pakistan	4	11	Nanjing University of Information Science and Technology	China	276
12	Nanjing University of Information Science and Technology	China	4	12	University of Electronic Science and Technology of China	China	242
13	North China Electric Power University	China	4	13	Wuhan University of Technology	China	204
14	Tongji University	China	4	14	Shandong University	China	185
15	University of Alicante	Spain	4	15	Central South University	China	171
16	University of Science and Technology Beijing	China	4	16	Chang'an University	China	143
17	The University of Texas Rio Grande Valley	United States	4	17	Guizhou University	China	143
18	Xidian University	China	4	18	Xuzhou University of Technology	China	143
19	China University of Mining and Technology	China	3	19	Qingdao Agricultural University	China	127
20	Hunan University	China	3	20	Universiti Teknologi PETRONAS	Malaysia	122

The document threshold and citation threshold of an organisation were set as 2 and 5, respectively. This produced 80 institutions

Table 8: Cluster analysis– bibliographic coupling

Cluster	Authors	Title (most-cited articles)	Journal	Year	Total citations	Theory	Results	Theme	Relevant topics related
1	Li et al.	Does corporate environmental responsibility engagement affect firm value? The mediating role of corporate innovation	Business Strategy and The Environment	2020	265	Stakeholder Theory, Resource Based Theory, and Voluntary Disclosure Theory	CER negatively influences the firm's value, where corporate innovation mediates the relationship.		
1	Flammer et al.	Corporate governance and the rise of integrating corporate social responsibility criteria in executive compensation: Effectiveness and implications for firm outcomes	Strategic Management Journal	2019	230	Agency Theory	CSR increases the firm's value in the long term, fosters social and environmental initiatives, reduces emissions, and enhances green innovations.	CSR, ESG, and Green Innovation's Impact on Firm Performance	Corporate environmental responsibility and firm value. CSR in executive compensation and firm outcomes.
1	Hao et al.	Corporate social responsibility (CSR) performance and green innovation: Evidence from China	Finance Research Letters	2022	127		CSR has a positive effect on GI.		
1	Xu et al.	R&D investment, ESG performance and green innovation performance: evidence from China	Kybernetes	2021	144	Stakeholder Theory	R and D investment positively influences GI, and ESG moderates the relationship.		CSR performance driving green innovation. R&D, ESG, and green innovation connections.
1	Xue et al.	Corporate Social Responsibility and High-quality Development: Do Green Innovation, Environmental Investment and Corporate Governance Matter?	Emerging Markets Finance and Trade	2022	106		CSR significantly improves Corporate Development Quality		Corporate governance and green innovation's role in sustainable growth.
1	Li et al.	How do ESG affect the spillover of green innovation among peer firms? Mechanism discussion and performance study	Journal of Business Research	2023	87		ESG leads to Green Innovation and Sustainable Performance.		ESG's influence on green innovation spillovers.
1	Patari et al.	Global sustainability megaforces in shaping the future of the European pulp and paper industry towards a bioeconomy	Forest Policy and Economics	2016	82	Resource Based Theory	Sustainability mega forces are a part of the European PPI business strategy and the future competitiveness of PPI.		Sustainability trends transforming industries.
1	Pan et al.	Corporate social responsibility and eco-innovation: The triple bottom line perspective	Corporate Social Responsibility and Environmental Management	2021	81	Resource Based Theory	The CSR social and financial dimension positively strengthens sustainable environmental innovation but fails to support the moderating role of pollution prevention.		Eco-innovation through the triple bottom line. ESG-green innovation interaction and firm value. Mandatory CSR disclosure and green innovation.

(Contd...)

Table 8: ***(Continued)***

Cluster	Authors	Title (most-cited articles)	Journal	Year	Total citations	Theory	Results	Theme	Relevant topics related
1	Zhang et al.	The Interaction Effect between ESG and Green Innovation and Its Impact on Firm Value from the Perspective of Information Disclosure	Sustainability	2020	79	Stakeholder Theory	GI and disclosure of environmental and social information positively influence the firm's value.		
1	Hong et al.	The impact of mandatory CSR disclosure on green innovation: evidence from China	Green Finance	2020	77		GI positively influences the environmental regulations.		
2	Kraus et al.	Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation	Technological Forecasting and Social Change	2020	533	Natural Resource Based Theory	CSR does not directly influence environmental performance but is positively related to environmental strategy and green innovation, which mediates the relationship.	CSR, Green Innovation, and Environmental Performance	CSR, environmental strategy, and green innovation for better performance. Knowledge management's role in driving green innovation. CSR and green innovation in manufacturing sustainability. Green capabilities and triple bottom line performance. CSR transforming green strategies into sustainable outcomes. Stakeholder pressure and environmental practices through knowledge management. Green financing and CSR's role in technological innovation during COVID 19. Environmental strategy and leadership's impact on green innovation.
2	Shahzad et al.	Exploring the influence of knowledge management process on corporate sustainable performance through green innovation	Journal of Knowledge Management	2020	261	Resource Based Theory	KMP leads to GI, which influences Corporate Sustainable Performance. GI mediates the relationships.		
2	Shahzad et al.	Relation of environment sustainability to CSR and green innovation: A case of Pakistani manufacturing industry	Journal of Cleaner Production	2020	247	Theory of Sustainable Development	CSR to environment is positively linked, while CSR to consumer has a weaker impact on ESD.		
2	Khan et al.	Green capabilities, green purchasing, and triple bottom line performance: Leading toward environmental sustainability	Business Strategy and The Environment	2023	85	Resource Based View	GC positively relates to purchasing habits, and green buying strategies lead to TBL performance.		
2	Le	How do corporate social responsibility and green innovation transform corporate green strategy into sustainable firm performance?	Journal of Cleaner Production	2022	81	Stakeholder Theory, Resource Based Theory, and Legitimacy Theory	CSR and GI partially mediate the relationship between GS and SP.		
2	Shahzad et al.	Translating stakeholders' pressure into environmental practices - The mediating role of knowledge management	Journal of Cleaner Production	2020	63	Stakeholder Theory	SP has a significant positive impact on the KMP, CSR, and GI.		

(Contd...)

Table 8: ***(Continued)***

Cluster	Authors	Title (most-cited articles)	Journal	Year	Total citations	Theory	Results	Theme	Relevant topics related
2	Awawdeh et al.	Role of green financing and corporate social responsibility (CSR) in technological innovation and corporate environmental performance: a COVID-19 perspective	China Finance Review International	2022	59		TI has a positive effect on EP and company performance. GF is also significantly positive, and CSR plays an insignificant role in EP.		CSR and green product innovation boosting organizational performance. Absorptive capacity in SMEs for circular economy models.
2	Hussain et al.	Exploring the mediating role of environmental strategy, green innovations, and transformational leadership: the impact of corporate social responsibility on environmental performance	Environmental Science and Pollution Research	2022	58	Resource Based Theory	GI, GC, GS, and GTL influence the EP that mediates CSR and EP.		
2	Hang et al.	Does corporate social responsibility and green product innovation boost organizational performance? a moderated mediation model of competitive advantage and green trust	Economic Research-Ekonomska Istrazivanja	2022	54		CSR and GPI are positively related to OP. CA mediates the relationship between CSR, GPI, and OP.		
2	Marrucci et al.	Antecedents of absorptive capacity in the development of circular economy business models of small and medium enterprises	Business Strategy and The Environment	2022	44	Absorptive Capability Theory	AC contributes towards the development of circular economy businesses.		
3	Zhang et al.	Critical success factors of green innovation: Technology, organization and environment readiness	Journal of Cleaner Production	2020	213	Innovation Diffusion Theory (Technology Organization Environment Framework)	GI leads to Competitive Advantage through the mediation of Environmental and Firm Performance.	Green Innovation, CSR, and Competitive Sustainability	Technology, organization, and environment readiness for green innovation. Sustainable supplier evaluation and selection. Drivers and outcomes of green product and process innovation. Green innovation as a strategic firm resource. CSR and green innovation boosting competitiveness.

(Contd...)

Table 8: ***(Continued)***

Cluster	Authors	Title (most-cited articles)	Journal	Year	Total citations	Theory	Results	Theme	Relevant topics related
3	Bai et al.	Social sustainable supplier evaluation and selection: a group decision-support approach	International Journal of Production Research	2019	181	Prospect Theory (TODIM) and Grey System Theory	Social sustainability attributes decision framework.		Environmental innovation and international business strategies.
3	Tariq et al.	Drivers and consequences of green product and process innovation: A systematic review, conceptual framework, and future outlook	Technology in Society	2017	179	Resource Based Theory, Institutional Theory, Stakeholder Theory	The drivers of GI (i.e., product and process) have positive consequences on performance and competitive advantage.		Proactive versus reactive CSR approaches and outcomes.
3	Khanra et al.	A resource-based view of green innovation as a strategic firm resource: Present status and future directions	Business Strategy and The Environment	2022	133	Resource Based View	GI is identified as a strategic resource.		Founder's role in building brands through green innovation.
3	Padilla-Lozano and Collazzo	Corporate social responsibility, green innovation and competitiveness - causality in manufacturing	Competitiveness Review	2022	97	Stakeholder Theory	CSR and GI increases the manufacturing competitiveness.		Open innovation in green processes and consumer products.
3	Chiarvesio et al.	Environmental Innovations and Internationalization: Theory and Practices	Business Strategy and The Environment	2015	91		Firms' geography positively relates to green strategies and influences innovation activities.		Technology, culture, and innovation for sustainability.
3	Chang	Proactive and reactive corporate social responsibility: antecedent and consequence	Management Decision	2015	82	Stakeholder Theory and Resource Based Theory	Green Organizational Culture positively influences CSR and GPI performance, where CSR mediates this relationship.		
3	Hillestad et al.	Innovative corporate social responsibility: the founder's role in creating a trustworthy corporate brand through green innovation	Journal of Product and Brand Management	2010	77	Legitimacy Theory, Organization Theory, Institutional and Impression Management Theories	The founder is a cultural architect who has a positive influence on the company's innovation, reputation, and environmental awareness.		
3	Yang et al.	Open for Green Innovation: From the Perspective of Green Process and Green Consumer Innovation	Sustainability	2019	47		Open innovation leads to green innovation (i.e., product and process).		
3	Yang et al.	Green, Green, It's Green: A Triad Model of Technology, Culture, and Innovation for Corporate Sustainability	Sustainability	2017	44	Resource Alignment Perspective	GIS and GC play a significant role in GI and indirectly effect IS-cultural fit, innovation-IS fit, and innovation-cultural fit.		

(Contd...)

Table 8: ***(Continued)***

Cluster	Authors	Title (most-cited articles)	Journal	Year	Total citations	Theory	Results	Theme	Relevant topics related
4	Yuan et al.	Do corporate social responsibility practices contribute to green innovation? The mediating role of green dynamic capability	Technology in Society	2022	196		CSR positively influence GI (i.e., Product and Process).	CSR, Green Innovation, and Sustainable Development	CSR practices enhancing green innovation through dynamic capability.
4	Khan et al.	Does adoption of ISO 56002-2019 and green innovation reporting enhance the firm sustainable development goal performance? An emerging paradigm	Business Strategy and The Environment	2021	78	Voluntary Disclosure Theory, Legitimacy Theory, Institutional Theory	Adopting GI reports ISO 56002□2019 increases the level of transparency of business activities, boosts stakeholder confidence, and enhances SD.		ISO 56002 adoption and green innovation reporting for sustainable development.
4	Khan et al.	Embracement of industry 4.0 and sustainable supply chain practices under the shadow of practice-based view theory: Ensuring environmental sustainability in corporate sector	Journal of Cleaner Production	2023	58	Practice Based Review	SSCPs positively affect environmental, social, and economic performance		Industry 4.0 and sustainable supply chain practices ensuring environmental sustainability.
4	Khan et al.	Vinculum of Sustainable Development Goal Practices and Firms' Financial Performance: A Moderation Role of Green Innovation	Journal of Risk and Financial Management	2022	32	Natural Resource Based Theory and Stakeholder Theory	Environmental SDGs are positively related to firm's FP, and social SDGs are negatively significant to firm's FP, where GI strengthens these relationships.		Green innovation's role in linking SDG practices and financial performance.
4	Huo et al.	Modeling the impact of corporate social responsibility on sustainable purchase intentions: insights into brand trust and brand loyalty	Economic Research-Ekonomska Istrazivanja	2022	20	Natural Resource Based Theory	CSR significantly impacts the purchase intention. GI improves CSR and GIT partially mediated by BL, with BT and BL modulating the link.		CSR's influence on sustainable purchasing, brand trust, and loyalty.
4	Xu et al.	The Mediating Role of Green Technology Innovation with Corporate Social Responsibility, Firm Financial, and Environmental Performance: The Case of Chinese Manufacturing Industries	Sustainability	2022	13		GTI significantly mediates the relationship between CSR and firms FP and EP.		Green technology innovation mediating CSR, financial, and environmental performance.
4	Nureen et al.	Nexus between corporate social responsibility and firm performance: a green innovation and environmental sustainability paradigm	Environmental Science and Pollution Research	2023	12	Natural Resource Based Theory	CSR does not directly influence FP. It positively correlates with GTL and GI, which improves FP.		CSR, green innovation, and environmental sustainability impacting firm performance. CSR's impact on financial performance in developing countries.

(Contd...)

Table 8: *(Continued)*

Cluster	Authors	Title (most-cited articles)	Journal	Year	Total citations	Theory	Results	Theme	Relevant topics related
4	Ma et al.	The Corporate Social Responsibility and Its Impact on Financial Performance: A Case of Developing Countries	Sustainability	2023	11		CSR positively affects the ESG, and SD mediates the relationship between GI and FP.		Environmental information disclosure driving corporate sustainability.
4	Ding et al.	The Impact Mechanism of Environmental Information Disclosure on Corporate Sustainability Performance-Micro-Evidence from China	Sustainability	2022	11	Theory of Green Innovation	EID significantly influences GI and improves SP. FC hinders the impact of EID on SP, where female directors have only a symbolic effect.		CSR's effect on social performance via corporate image and green innovation.
4	Fosu et al.	The effect of CSR on corporate social performance: Mediating role of corporate image, green innovation and moderating role of corporate identity	Corporate Social Responsibility and Environmental Management	2024	11		CSR elevates SP through CI and GI, where corporate identity moderates the relationship.		

4. DISCUSSION AND COMMENTARY

The concept of sustainability has gained immense importance over time. As the world has become more aware of environmental scenarios (Nehrbass-Ahles et al., 2020), societies and organizations are advancing towards securing sustainable performance (Shahzad et al., 2020). In academics, many ambiguities concerning sustainable performance publications need to be addressed. The first is that areas that have received limited attention among the researchers must be considered. Research often focuses on the environmental and social dimensions and neglects integration and governance. This requires conducting studies to support social and environmental initiatives. Most research emphasized industries such as manufacturing (Padilla-Lozano and Collazzo, 2022) and energy, leaving the other sectors behind (e.g., healthcare, agriculture, paper industry [Pätäri et al., 2016]). Therefore, to address the ambiguities in sustainable performance, future researchers must focus on neglected areas and adopt multidisciplinary approaches to academic disclosure and governance (Li et al., 2023), providing actionable insight for businesses, stakeholders, and policymakers regarding sustainability and corporate quality development (Xue et al., 2022). Synthesizing the bibliometric analysis reveals the evolution of the research topic on sustainable performance, mainly focusing on the niche areas. The publications are empowered by different groups, authors, and publishers.

5. CONCLUSION

5.1. Implication of the Study

Based on the bibliometric analysis, the study presents several implications. This study provides an overview of the evolution of the sustainability literature in different academic journals and identifies the most relevant topics related to the firm's sustainable performance. With that, it identifies the most cited paper and opportunities that can be focused on. The future authors can analyze various issues related to sustainable performance. It is witnessed that there has been a literature gap in the assessment of the academic literature on firms' social and environmental performance. Filling the academic research gap requires a systemic and multidisciplinary approach to identify the patterns and trends in the literature. This may involve implementing social and environmental studies across different geographical areas. This bibliometric analysis will help address these gaps by combining diverse case studies, surveys, articles, etc. It will bridge the academic gap and present the findings with real-world applications. For example, the existing research can be analyzed by gaining insight into the under researched sectors such as agriculture, etc. Emerging economies can explore unique opportunities and gain a broader understanding of the globally relevant data. The policymakers can foster collaboration among the environmental sciences, business management, and other fields to increase real-world applicability. Indeed, academic research aligned with practical needs can drive change.

In the bibliometric analysis, a structured overview of the sustainable performance literature makes it easy to identify the performance drivers and barriers. Hence, this field requires some attention in the coming years. For that, future studies must

enhance their literature research to overcome this research gap. The frequency of publication has highlighted the flaws in the research topic that may suggest that these gaps must be overcome in practice. Many of the research projects are subsidized by the government. Therefore, sustainable performance should be commercialized seriously at both the micro and macro levels. Policymakers and market professionals must also play their role in advancing this sustainable academic goal. The match between academic knowledge and practices can remain an issue if it is not addressed in research and practice. Sustainability is the desire of every region and industry, so it should be aligned with ecological values, such as CSR, Green innovation, ESG, etc., to gain positive outcomes. This topic is of great interest to future scholars. This field of sustainability is the leading topic and should be conducted in different industries, regions, and contexts. Embracing the importance of sustainable performance will benefit not only individuals but also societies worldwide.

5.2. Limitation and Recommendations

Firstly, the challenge involved in this research is finding the keywords, as some of the keywords used spelling and abbreviations interchangeably. Therefore, we might have missed some important keywords while searching the publications. Future studies can use other databases, such as Scopus, Science Direct, JSTOR, etc., to strengthen the future results. It is hoped that research can be integrated into the new markers instead of focusing on well-developed markets.

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