



Original Article

Sustainable Development and Green Initiatives: A Bibliometric Analysis based on Scopus Database

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Abstract

Sustainability efforts that encourage the creation of ecologically friendly goods and services are the driving force behind green initiatives. Evaluating previous study publishing trends on SDGs and green businesses was the objective of this study. Using the Scopus database, "sustainable development" and "green initiatives" were the two key terms employed to perform bibliometric analysis. The performance analysis metrics include contributions from leading universities and nations and publications by the most prolific writers. We scientifically mapped the co-citation analysis of authors, bibliographic collaborations of journals and nations, and co-occurrence of keywords using VOSviewer. A total of 789 articles were made between 2004 and 2024, with a maximum of 196 publications in 2023. The Chinese Academy of Sciences ranked first with 17 publications. Out of 108 country-specific publications, China had the most (149 articles), followed by India (100) and the USA (96). The most cited writers were Wang Y. with (160) papers, Zhang Y. (143), and Li Y. with (131). The most frequently occurring keywords were "sustainable development" (376 times), "sustainability" (156 times), "climate change" (109 times), and so on. The findings of this study could significantly improve resource optimization, establish sustainable supply networks, and incorporate real-time environmental monitoring.

Keywords: Sustainable Development, SDGs, Green Initiatives, Bibliometric Analysis, Scopus Database, VOSviewer

Introduction

Sustainable development is crucial globally because of significant environmental issues, including resource depletion, biodiversity loss, and climate change. Environmental change drives markets to adapt to the increasing environmental consciousness of consumers (Saari et al., 2017). The implementation of Sustainable Development Goals (SDGs) and intensification of environmental issues result in behavioral changes among stakeholders and consumers (Pimonenko et al., 2020). Sustainable consumption is defined as consumption that maximizes the economic, social, and environmental impacts of product acquisition, use, and disposal while considering future generations (Saari et al., 2017).

What do you mean by Green Initiatives?

Green HRM: It is the systematic and deliberate alignment of conventional HRM practices with the environmental objectives of an organization.

Green Innovation: As mentioned by (Md Khudzari et al., 2018), the world community is searching for alternatives to meet global energy needs due to a number of factors, such as the depletion of fossil fuel reserves, the amount of waste generated, the consequences of climate change, and exponential growth in the human population.

Green Consumerism: A fundamental approach to address unsustainable consumption is green consumerism. Green consumers purchase and utilise environmentally sustainable products. Eco-conscious consumers endorse products that pose minimal risk to human health or harm to the environment. The study urges students to become more ecologically aware (Mbokane & Modley, 2024).

Green Businesses: As per (Pimonenko et al., 2020), stakeholders seek to invest in sustainable enterprises and projects, consumers prefer to buy eco-friendly products rather than traditional ones, and both investors and consumers avoid engaging with unethical green businesses.

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This research report focuses on the following Objectives or Research Questions (RQs) pertaining to "Sustainable Development" and "Green Initiatives":

RQ1: Which are the most prominent authors?

RQ2: Which year has the most cumulative publications between 2004 and 2024?

RQ3: Which are the top journal sources with maximum number of papers published?

RQ4: Which are the top subject areas?

RQ5: Which affiliations/universities are the most prominent for publishing relevant?

RQ6: Of the several document types published, which are the most prevalent?

RQ7: Which countries have published the most articles overall?

RQ8: Which top funding agencies funded the most research articles?

RQ9: Which are the co-citations of the most cited authors?

RQ10: What journals have the highest bibliographic coupling of journal sources?

RQ11: Which countries have the highest number of bibliographic coupling networks?

RQ12: What are the most frequently used author keywords while publishing articles?

This study assessed the mapping of scholarly publications related to sustainable enterprises and innovative green practices that advance Sustainable Development Goals (SDGs). It encompasses the scientific outputs of publications, prolific authors, leading universities, keyword analysis, bibliographic coupling among countries, and highly cited papers.

Literature Review

The evaluation of Asia's advancement at national and regional levels in relation to the SDGs concerning resource utilization, sustainable production and consumption, and the triple planetary problem encompasses pollution emissions, biodiversity loss, and climate change. The analysis underscores the urgent need for a comprehensive strategy to tackle resource utilization, pollution emissions, biodiversity decline, and climate change. China has experienced a significant rise in its greenhouse gas emissions and India is striving to utilize renewable energy to decouple growth from emissions. Pakistan, being susceptible, needs financial aid to mitigate pollution. Vietnam, Thailand, and Indonesia have offered methodologies to mitigate emissions (Mahmood et al., 2023).

Land-use change is a significant factor contributing to biodiversity loss, highlighting the necessity for conservation and sustainable land policies. International cooperation and policy reform are essential for enhancing global water use efficiency, while careful management of freshwater resources is crucial for sustainability (Mahmood et al., 2023).

(Ahmed et al., 2021) evaluated the impact of competitive differentiation advantage, cost leadership competitive advantage, and proactive environmental strategy on an organization's competitive and sustainable growth, focusing

on performance metrics such as financial, process, production, and product performance.

As stated by (Khan & Muktar, 2020), under the framework of green HRM, human resource management significantly contributes to actualizing sustainability by enacting environmentally sustainable policies.

Eco-Friendly Brands: The perceived sustainability and environmental responsibility of a brand contribute to the pro-environmental self-identity of environmentally concerned consumers, aiding them in utilizing brands to shape their identities (Chen et al., 2021).

Incorporating eco-friendly techniques into business operations: An eco-friendly hotel uses eco-friendly best practices in its supply, services, goods, logistics, and maintenance in order to reduce its adverse environmental consequences (Kokkhangplu et al., 2023). (Saari et al., 2017) The consumer products sector may be influenced by environmentally conscious customer trends. The automobile and fast-moving consumer goods sectors have already experienced a significant influence from green consumerism by adopting more sustainable practices. Businesses have to swiftly adapt their strategies to conform to the developing paradigm of transitioning from excessive consumption to ecologically sustainable green consumption (Pimonenko et al., 2020).

Research Methodology

Bibliometric Analysis: Alan Pritchard coined the term "bibliometrics," and defined it as the "application of mathematics and statistical methods to books and other media of communication." According to (Kannan P, 2019), it is a quantitative evaluation of several aspects of the literature on a topic and aims to identify trends in authorship, publishing, and secondary journal coverage to shed light on the dynamics of knowledge expansion in the fields of study. It is easier to investigate, arrange, and communicate work performed in a particular discipline when bibliometric research, such as citation and co-citation analysis, is used to examine literary trends and attributes (Faruk et al., 2021).

Search Strategy

The two significant phrases "sustainable development" and "green initiatives" were employed between 2004 and 2024. The primary data source for VOSviewer software (version 1.6.15) was Scopus. In total 794 articles were retrieved from the initial search. The "All field" search criterion and time period filter were applied, the total number of documents was whittled down to 789.

The subject categories helped to further refine the papers.

Below is a summary of performance analysis and science mapping indicators:

- i. Examination of performance metrics: contributions from cumulative publications by year, number of publications by the most prolific authors, prominent journals, and contributions from top countries.
- ii. Document-wise citation analysis of top authors, most-cited journals, co-citation of most-cited authors,

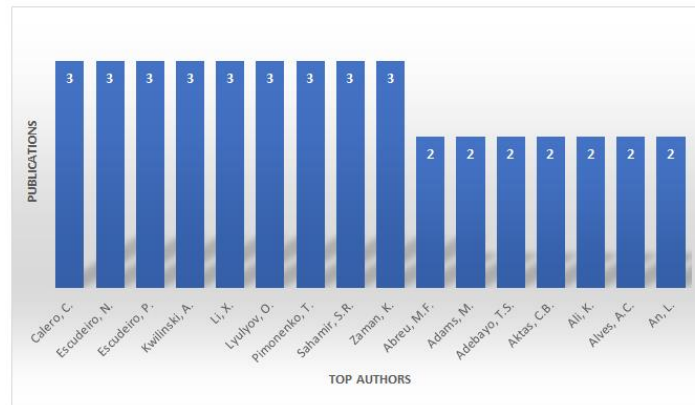
bibliographic coupling of universities and sources,
 bibliographic coupling of countries, and co-occurrence

of all keywords are all included in the science mapping indicators.

Results & Discussions

a. Performance Analysis

1. Most Prominent Authors



Source: Scopus Database

Figure1. displays the most prominent authors, out of the 318

2. Cumulative Publications by Year

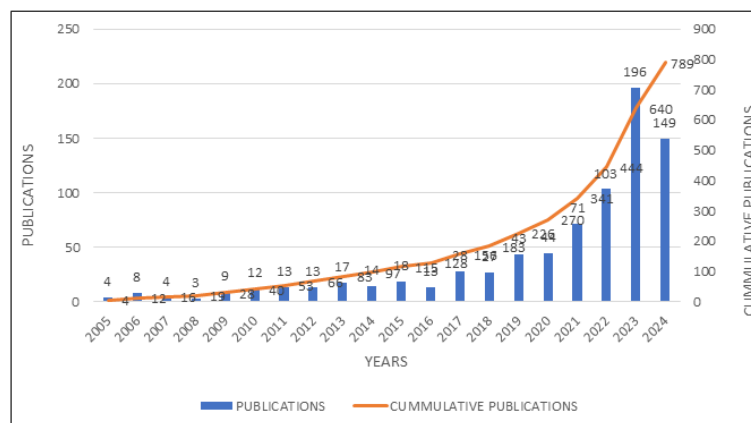


Figure 2. displays a combo chart of 789 cumulative publications by year from 2004 to 2024 with maximum 196

publications on “Sustainable Development” and “Green Initiatives” in the year 2023.

3. Top Journal sources

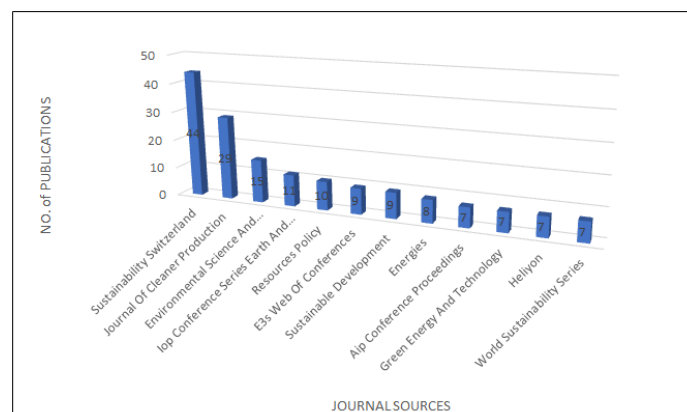


Figure 3. shows the top journals, Sustainability Switzerland published the most articles out of a total of 116 journal sources.

4. Top Subject Areas

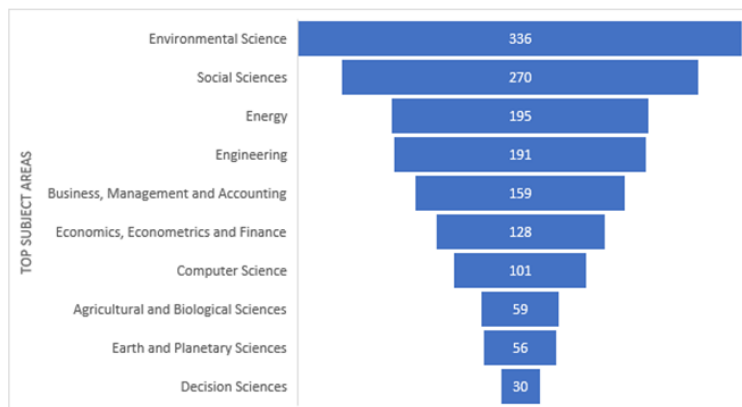


Figure 4. shows the preferred subject areas, with Environmental Science being in the top subject category,

where most of the articles on the domain of "sustainable development" and "green initiatives" were published.

5. Top Universities

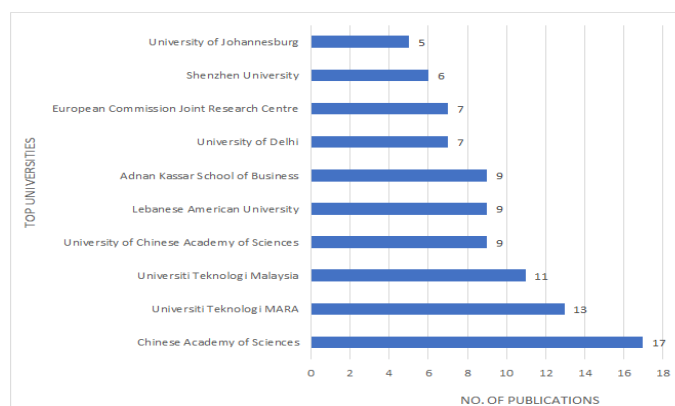


Figure 5. represents Chinese Academy of Sciences leading with (17) articles out of 160 affiliations, followed by the others.

6. Document Types

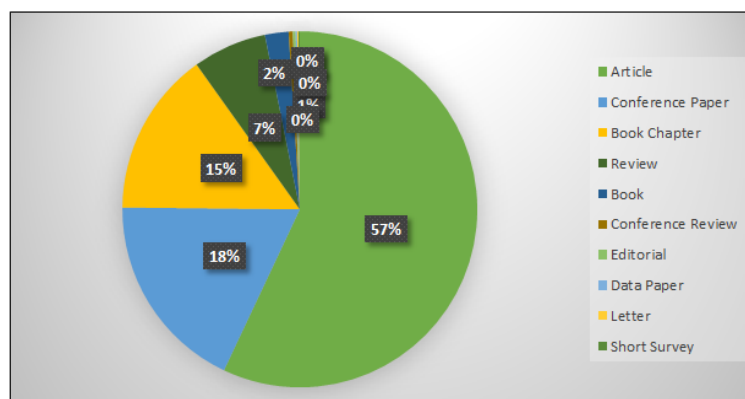


Figure 6. give details about document types with 57% of articles published in English language on this subject area.

Table 1. Country-wise Published Documents

#	country	documents	citations	total link strength	#	country	documents	citations	total link strength
1	China	149	1814	125	11	South Africa	25	676	19
2	India	100	1320	69	12	Brazil	23	226	46
3	United states	96	2170	82	13	Turkey	23	366	37
4	Malaysia	69	721	68	14	Pakistan	22	369	38
5	United Kingdom	61	1769	133	15	Poland	22	298	34
6	Italy	40	805	66	16	Saudi Arabia	21	181	61
7	Australia	37	1267	73	17	Canada	19	324	15
8	Spain	35	559	49	18	Indonesia	19	275	18
9	Russian federation	34	520	39	19	France	18	478	49
10	Germany	32	617	60	20	Portugal	17	324	30

Table 1. exhibits country-wise published documents with number of citations and total link strength

7. Top 10 Countries

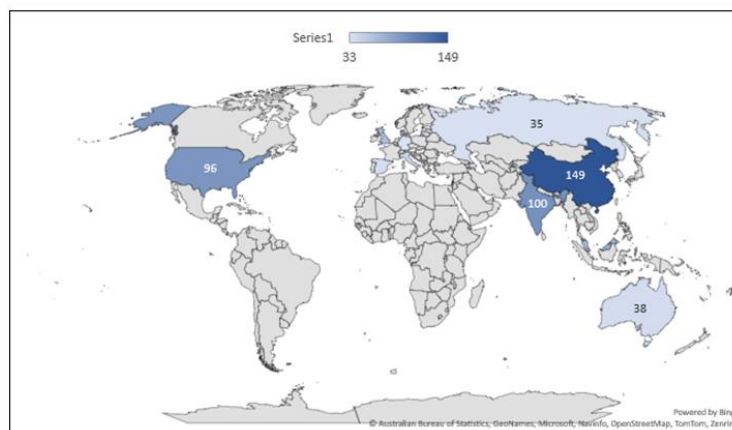


Figure 7. displays the world map of the top 10 out of 108 countries, including China (149), India (100), the United States of America (96), and Japan (33).

8. Top 10 Funding Agencies

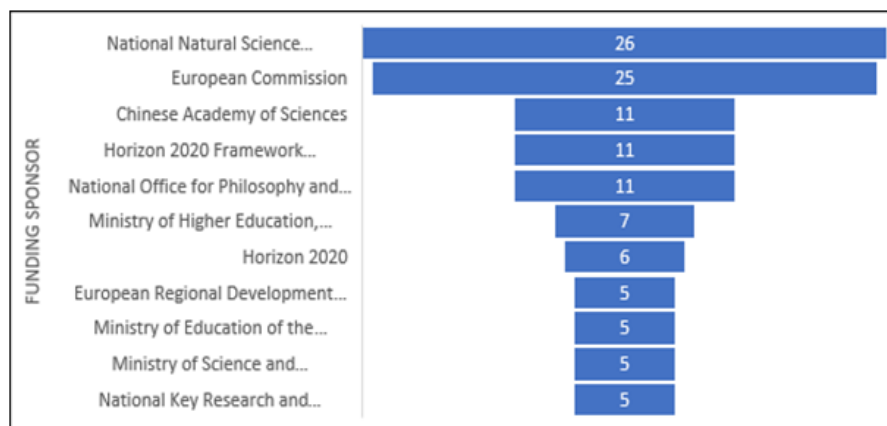


Figure 8. displays the top ten Funding Agencies out of 159. The National Natural Science Foundation of China led to 26

articles, the European Commission led with 25 articles, and others.

b. *Science Mapping Indicators*

Table 2. Co-citation analysis of the most cited authors

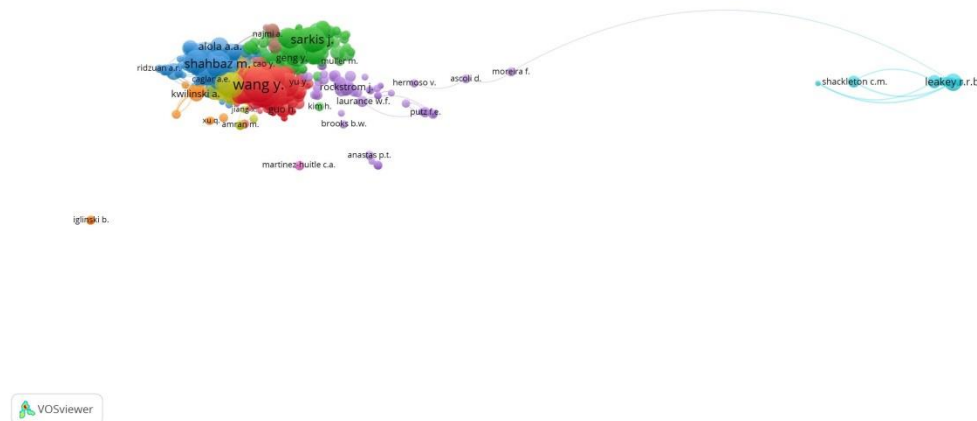
#	author	citations	total link strength	#	author	citations	total link strength
1	Wang Y.	160	13630	11	Li X.	90	7195
2	Zhang Y.	143	10970	12	Sarkis J.	90	5153
3	Li Y.	131	10872	13	Chen Y.	89	7192
4	Zhang X.	115	8173	14	Zhang J.	85	8226
5	Liu Y.	111	9214	15	Adebayo T.S.	84	10530
6	Wang X.	111	9306	16	Liu J.	83	5551
7	Li J.	110	9341	17	Mohsin M.	78	8003
8	Shahbaz M.	99	9960	18	Wang Z.	78	8372
9	Wang J.	99	8180	19	Liu X.	77	7441
10	Taghizadeh-Hesary F.	96	7994	20	Ozturk I.	77	9012

Source: Scopus Database

Table 2. displays the co-citation analysis of 20 most cited authors with citations and total link strength. Authors

received most citations in this domain shows the interest in the subject category.

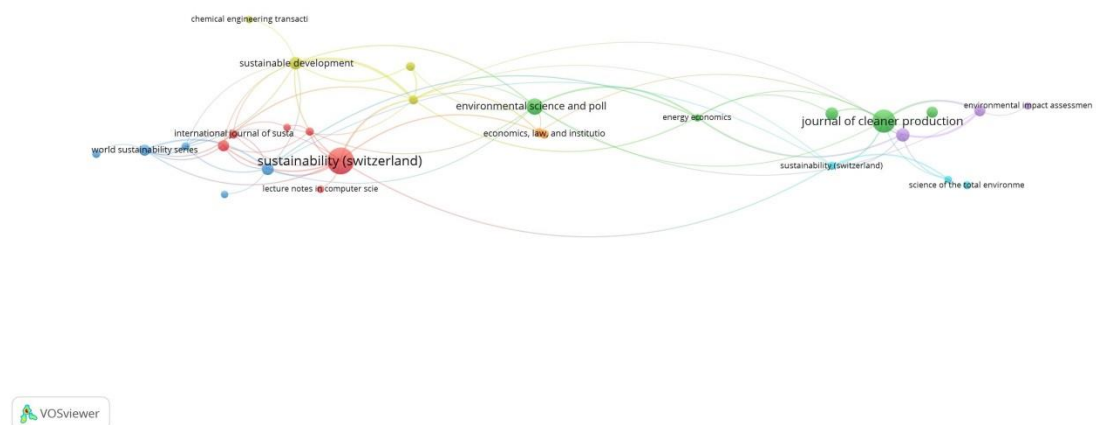
9. Co-citation analysis of the most cited authors



Source: Scopus Database

Figure 9. displays the co-citation analysis of the most cited authors with network visualization using VOSviewer software.

10. Bibliographic Coupling of Journal sources

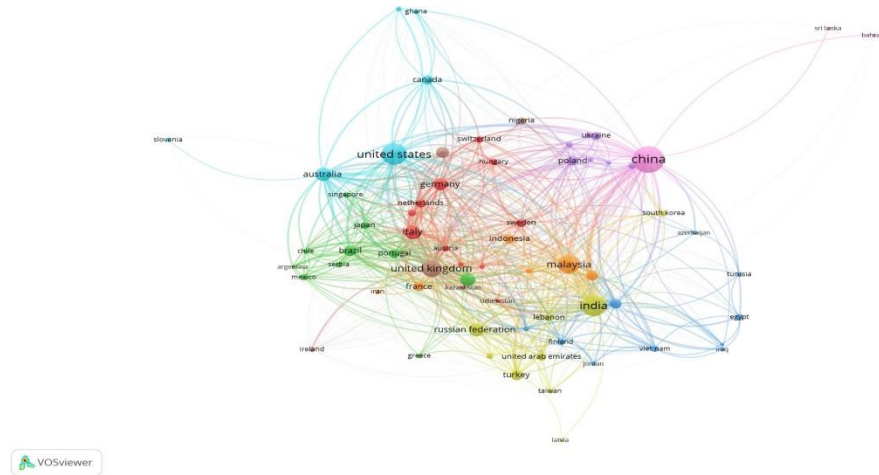


Source: Scopus Database

Figure 10. displays the bibliographic coupling of top journal sources. It shows journal names- (documents, citations, total link strength) as the most preferred topics in

this domain of “sustainability” and “green initiatives” in collaboration with these global journals.

11. Bibliographic Coupling of Countries



Source: Scopus Database

Figure 11. shows the selected network visualization mode for bibliographic coupling of countries in VOSviewer. It shows that countries such as China, the United States, India,

Malaysia, Indonesia, and Australia have maximum collaboration with other nations.

Table 3. Co-Occurrence of All Keywords

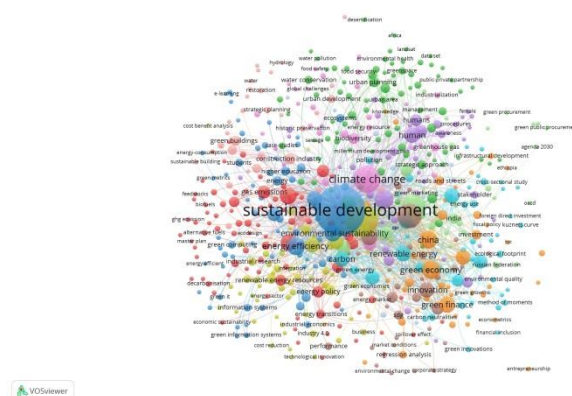
#	keyword	occurrences	total link strength	#	keyword	occurrences	total link strength
1	sustainable development	376	3057	11	greenhouse gases	41	459
2	sustainability	156	1220	12	environmental impact	39	389
3	climate change	109	948	13	green finance	39	277
4	sustainable development goal	89	781	14	investments	39	463
5	sustainable development goals	80	404	15	renewable energy	38	427
6	environmental protection	55	598	16	innovation	36	334
7	green economy	53	463	17	planning	36	361
8	energy efficiency	50	466	18	carbon	35	444
9	china	46	511	19	economic development	34	407
10	environmental sustainability	42	381	20	human	34	439

Source: Scopus Database

Table 3. displays the co-occurrence of all top 20 relevant keywords with number of occurrences and total link strength. It demonstrates that the top occurrence of

keywords which authors have used to get the research papers to be searched and identified in this domain.

12. Co-Occurrence of All Keywords



Source: Scopus Database

Figure 12. shows the number of occurrences and keywords linking the strength of the keyword color reflects the document's typical publishing year in which a keyword occurs.

Limitations

The analysis was limited to articles that were indexed in the SCOPUS database, and it is possible that publications from unidentified databases, such as PubMed and Web of Science, were undetected.

Conclusion

The researchers answered the first eight research questions (RQs) based on performance bibliometric analysis. Figure 1. illustrates the top prominent authors out of 318 as Calero C. to Zaman K., with three article publications each followed by other authors. Figure 2. shows a combination chart of 789 cumulative publications, and the year 2023 shows the maximum 196 publications. Many researchers around the world have publications on different subject areas 'Environmental Science' (336), 'Social Sciences' (270), 'Energy' (195) & so on with most of the document types as articles published in English language. Figure 3. displays the top journal sources: - out of a total of 116 journals, Sustainability Switzerland has published a maximum of (44) articles, Journal of Cleaner Production (29), Environmental Science and Pollution Research (15), and others. Figure 4. shows the top preferred subject areas as "Environmental Science" lead with 336 articles, "Social Sciences" with 270, "Energy," 195, "Engineering", 191 and so on. Figure 5. reflects top 10 universities out of 160 affiliations, as the Chinese Academy of Sciences led with (17) articles, Universiti Teknologi MARA with (13), and Universiti Teknologi Malaysia (11) articles, followed by others. In Figure 6, most document types were articles published in English. Figure 7 displayed a world map. Table 1. represents the country (documents, citations, and total link strength) leading to China (149,1814,125), India (100,1320,69), and the United States (96,2170,82), followed by others. The top funding agencies are the National Natural Science Foundation of China (26) European Commission (25), and the Chinese Academy of Sciences (11) out of 159, as illustrated in Figure 8.

The researchers answered the last four research questions (RQs)- based science mapping using VOSviewer software by selecting the network visualization mode. Figure 9. displays a co-citation analysis of the most cited authors using a network visualization. Table 2. displays the co-citation analysis of the 20 most cited authors with citations and total link strength. Author Wang Y. led with 160 citations and a total link strength of 13630, Zhang Y. with 143 citations and total link strength of 10970, Li Y. with 131 citations and total link strength of 10872, followed by others. Figure 10. shows the bibliographic coupling of journal sources. It shows the journal names- (documents, citations, total link strength) as sustainability Switzerland (66,908,12), journal of cleaner production (58,2708,21), environmental science and pollution research (38,688,6), construction and building materials (28, 778,6), polymers (16,247,5), renewable and sustainable energy reviews (15,1481,4), and journal of environmental management (11,393,2). Figure 11. shows the bibliographic coupling of countries with China collaborating with the United States, India, Malaysia, Indonesia, Australia, etc. Figure 12. includes the co-occurrence of all the keywords of the subject area. Table 3. displays the co-occurrence of all top 20 relevant keywords with the number of occurrences and total link strength. It demonstrates that the top occurrence of keywords are "sustainable development" (376) times, "sustainability" (156), "climate change" (109), "sustainable development goal" (89), "environmental protection" (55), "green economy" (53), "energy efficiency" (50), followed by other keywords.

This study suggests that companies may adopt reliable green business practices that emphasize long-term, repairable, and recyclable product designs. Reducing energy and resource usage is often as result of implementing green initiatives. Adopting sustainable practices, such as recycling and waste reduction, along with energy-efficient technologies, can help businesses save a lot of money. The researchers found that a company's reputation and brand image can be improved by demonstrating a strong commitment to sustainability, as these are gaining favour from customers. Green innovation sparked by a focus on sustainability, leads to the development of new products and

services that cater to eco-conscious consumers. Future green initiatives are possible through real-time environmental effect monitoring, resource optimization, and building sustainable supply chains for businesses.

Author's Contribution

AV conceived the idea of the topic using bibliometrics, prepared the diagrams and tables, analysed the data and wrote the manuscript. MH and RS checked Grammar and did editing and proofreading of the manuscript. All the authors read and approved the manuscript.

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Nil.

Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Ethical Statement: The research does not include studies on human subjects or human data or tissue or animals

Data Access Statement: Research data supporting this publication are available on Scopus Database as mentioned in Search Strategy section.

References:

1. Ahmed, R. R., Streimikiene, D., & Zheng, X. (2021). The Impact of Proactive Environmental Strategy on Competitive and Sustainable Development of Organizations. *Journal of Competitiveness*, 13(4), 5–24. <https://doi.org/10.7441/joc.2021.04.01>
2. Chen, S., Qiu, H., Xiao, H., He, W., Mou, J., & Siponen, M. (2021). Consumption behavior of eco-friendly products and applications of ICT innovation. *Journal of Cleaner Production*, 287. <https://doi.org/10.1016/j.jclepro.2020.125436>
3. Faruk, M., Rahman, M., & Hasan, S. (2021). How digital marketing evolved over time: A bibliometric analysis on scopus database. In *Heliyon* (Vol. 7, Issue 12). Elsevier Ltd. <https://doi.org/10.1016/j.heliyon.2021.e08603>
4. Kannan P. (2019). *Bibliometric Analysis of Library Philosophy and Practice: A study based on Scopus Database*. <https://digitalcommons.unl.edu/libphilprac>
5. Khan, M. H., & Muktar, S. N. (2020). A bibliometric analysis of green human resource management based on scopus platform. *Cogent Business and Management*, 7(1). <https://doi.org/10.1080/23311975.2020.1831165>
6. Kokkhangplu, A., Onlamai, W., Chokpreedapanich, T., & Phikul, K. (2023). What Predicts Behavioral Intention in Eco-Friendly Hotels? The Roles of Tourist's Perceived Value and Satisfaction: A Case Study of Thailand. *Sustainability (Switzerland)*, 15(4). <https://doi.org/10.3390/su15043219>
7. Mahmood, A., Farooq, A., Akbar, H., Ghani, H. U., & Gheewala, S. H. (2023). An Integrated Approach to Analyze the Progress of Developing Economies in Asia toward the Sustainable Development Goals. *Sustainability (Switzerland)*, 15(18). <https://doi.org/10.3390/su151813645>
8. Mbokane, L., & Modley, L. A. (2024). Green Consumerism in Young Adults: Attitudes and Awareness in University Students in Johannesburg, South Africa. *Sustainability (Switzerland)*, 16(5). <https://doi.org/10.3390/su16051898>
9. Md Khudzari, J., Kurian, J., Tartakovsky, B., & Raghavan, G. S. V. (2018). Bibliometric analysis of global research trends on microbial fuel cells using Scopus database. *Biochemical Engineering Journal*, 136, 51–60. <https://doi.org/10.1016/j.bej.2018.05.002>
10. Pimonenko, T., Bilan, Y., Horák, J., Starchenko, L., & Gajda, W. (2020). Green brand of companies and greenwashing under sustainable development goals. *Sustainability (Switzerland)*, 12(4). <https://doi.org/10.3390/su12041679>
11. Saari, U. A., Baumgartner, R. J., & Mäkinen, S. J. (2017). Eco-friendly brands to drive sustainable development: Replication and extension of the brand experience scale in a cross-national context. *Sustainability (Switzerland)*, 9(7). <https://doi.org/10.3390/su9071286>
12. Xu, K., Yang, M., Yang, J., Nataliia, B., Cai, Y., Zhang, H., & Wang, Y. (2024). Mapping scholarly publications of energy conservation and emission reduction in support of the sustainable development goals (SDGs). In *Frontiers in Environmental Science* (Vol. 12). Frontiers Media SA. <https://doi.org/10.3389/fenvs.2024.1421990>