

Bibliometric Analysis of Green Entrepreneurship: A Comprehensive Look At Present and Future Pattern

Niveditha. E¹, Dr. Ramya Krishnan. M²

¹Research Scholar, Sree Narayana College, Kannur Kannur University

²Assistant Professor, Mary Matha Arts and Science College, Mananthavady 9495912596

Abstract:

Everyone has been impacted by climate change, and governments around the world are arguing over how to protect the environment. The recent increase in interest in research studies on green entrepreneurship lines up with the attainment of the Sustainable Development Goals (SDGs) established by the United Nations for 2030. The goal of this paper is to determine the extent of research that has been done in the field of green entrepreneurship. Articles published in SCOPUS starting in 2004 were examined using Biblioshiny. The trend of publications was evaluated concerning the nations where the most research has been conducted, the journals that have published the most papers on green entrepreneurship, author information, impact factor, and citations. The search was conducted in 2023 and yielded a total of 895 documents as a result of the keywords entered. This result was further filtered. The outcome was 590 articles related to Green Entrepreneurship or Sustainable Entrepreneurship and Sustainable Development. The search results were interpreted using the Biblioshiny software.

Keywords: Green entrepreneurship, Sustainable development, Bibliometric analysis.

1. INTRODUCTION

Humans have largely forgotten that environmental degradation and the disruption of the ecological balance are necessary conditions for human development and progress, as they race to offer themselves a wider range of highly advanced goods and services. Sustainable development is one of the most talked about topics these days, and promoting environmentally conscious start-ups can help reduce environmental impact and meet climate change targets. Sustainable development is the buzzword of the day, and sustainability must be evident in how we use all of our resources, natural and manmade. To make sure for future generations, development or progress is required(. & Anand, 2022).

The concept of green entrepreneurship emerged recently which links sustainable development to entrepreneurship (Schaltegger and Wagner., 2008). Over the years, it has been given different names by various scholars as “ecopreneurship” (Gerlach., 2003), “environmental entrepreneurship” (Dixon and Clifford., 2007), or “green entrepreneurship” (Chick., 2009). Green entrepreneurship is an emerging field of study and is still in its infancy (Demirel et al., 2019)and is a theme with immense topicality the growth of peer-reviewed articles in indexed journals has grown exponentially over the last years. According to past studies, green entrepreneurship is a trending research field that transforms the traditional business model into an environmentally friendly business (Demirel et al., 2019). This form of

entrepreneurship can be described as sustainable technology targeted at the mass market benefiting most people in society and making a considerable contribution to the transformation of a sustainable economy (Hall et al., 2010) (Zhou et al., 2021). However, according to the “Global Sustainable Development Report 2019”, the 2030 sustainable vision is making strides towards the immediate and deliberate transition of human well-being and social health. It also helps in minimizing the environmental impact of socioeconomic processes (Henkhaus et al., 2020) (Suganthi., 2018). Previous literature is explored to characterize and establish the relationship between “green entrepreneurship” and “sustainable development”. Green entrepreneurship is emerging as an academic research area with strong industry relevance (Buffa et al., 2018) (Drago & Gatto, 2022) (Gast et al., 2017) While the number of green start-ups has steadily increased around the world in response to the environmental problems demanding immediate solutions, there are several unresolved questions on the behaviour and performance of such ventures. The papers in this special issue shed light on these issues by underscoring the role of several factors, such as industry life cycles, knowledge spill overs, institutions, and availability of external finance, in shaping decision-making and firm behaviour in green start-ups. This paper highlights the state of the art developments in the literature, discusses the key contributions of the papers put together in this special issue, and presents a future research agenda for scholars interested in green entrepreneurship and sustainable development. Companies want to become more environmentally conscious to obtain a competitive edge. Despite this, standard research in green entrepreneurship is still scanty in its scope and research design (Zhao et al., 2020). As of now, there are only two bibliometric studies that provide a thorough analysis of the main forces behind and contribution of green entrepreneurship (Kumar & Kiran, n.d.) (Mondal & Singh, 2023). To establish a base, it is essential to know the trend and to ensure consistency, a bibliometric study is needed. The main aim of this paper is to provide an overview of the past, and present, and provide future research direction on green entrepreneurship and sustainable development. Further, it analyses which researchers are frequently cited and published in this area. This paper aims to study the following utilizing bibliometric analysis:

1. Citing notable authorship, references, and author affiliations and countries.
2. Learning about the major research themes and streams.
3. Assessing the level of collaboration through network visualization.

2. RESEARCH METHODOLOGY

To meet the 2030 global sustainable development target, green entrepreneurship has been accelerating recently, and interest in environmentally sustainable, or “green”, growth has surged. Even so, systematic or qualitative reviews on this popular topic remain lacking. Hence, this study uses bibliometric analysis to address this gap and gathered data from the SCOPUS database from 2004 to 2024. The database for the study was searched by typing the keyword (Green Entrepreneurship and Sustainable Development). The search was conducted in June 2024 and yielded a total of 895 documents as a result of the keyword entered. This result was further narrowed by specifying “articles” as the document type, “business, management, and accounting” as the subject, and “English” as the language. The outcome was 590 articles related to green entrepreneurship and sustainable development. The search results were interpreted using the biblioshiny software.

3. DESCRIPTIVE BIBLIOMETRIC ANALYSIS

3.1 Basic information

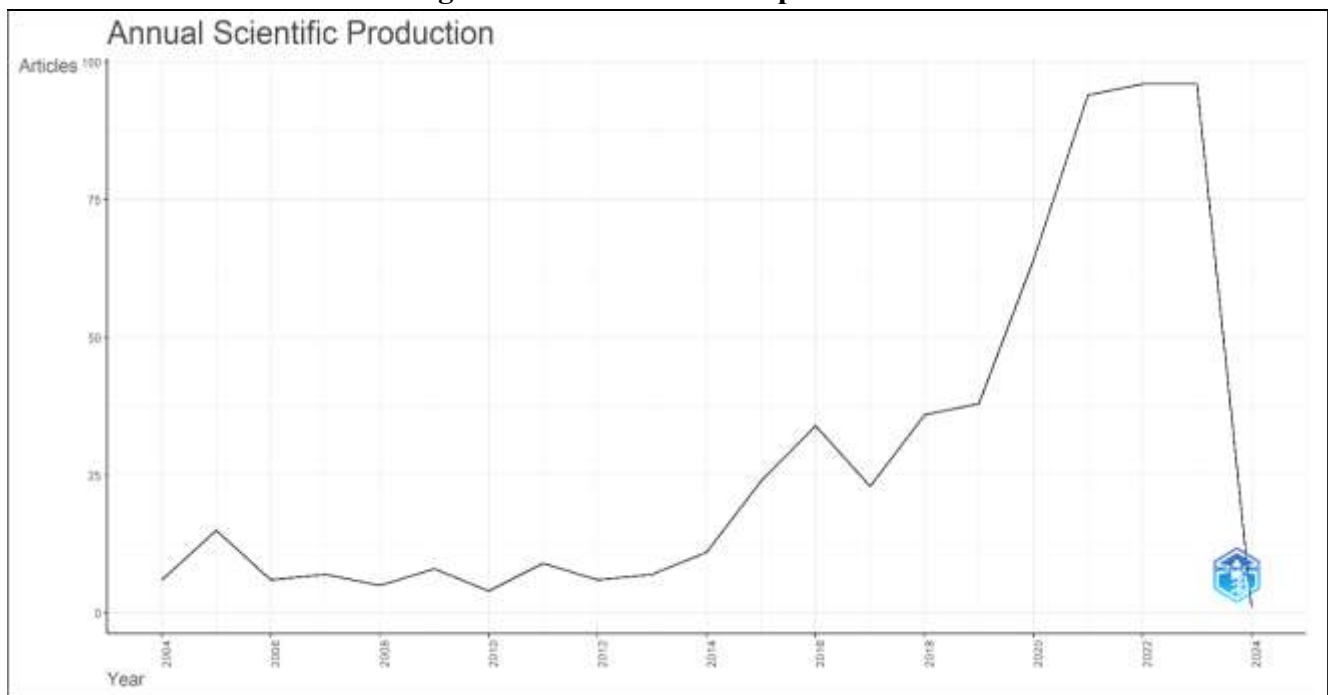
The primary statistics on Green entrepreneurship are shown in Table 1. It shows that from 2004 to 2024, 590 manuscripts were published in 255 journals by 1627 authors, of whom 104 were single authors.

Table 1: Main Information Relating to the Data

Description	Result
Documents	590
Timespan	2004-2024
Sources (Journals, Books, etc.)	255
Keywords Plus (ID)	1364
Author's Keywords (DE)	1898
Authors	1627
Authors of single-authored docs	97
Single-authored docs	104
Co-Authors per Doc	2.94
Document type- article	590

3.2 Annual scientific production

Figure 1: Annual scientific production



Source- Biblioshiny

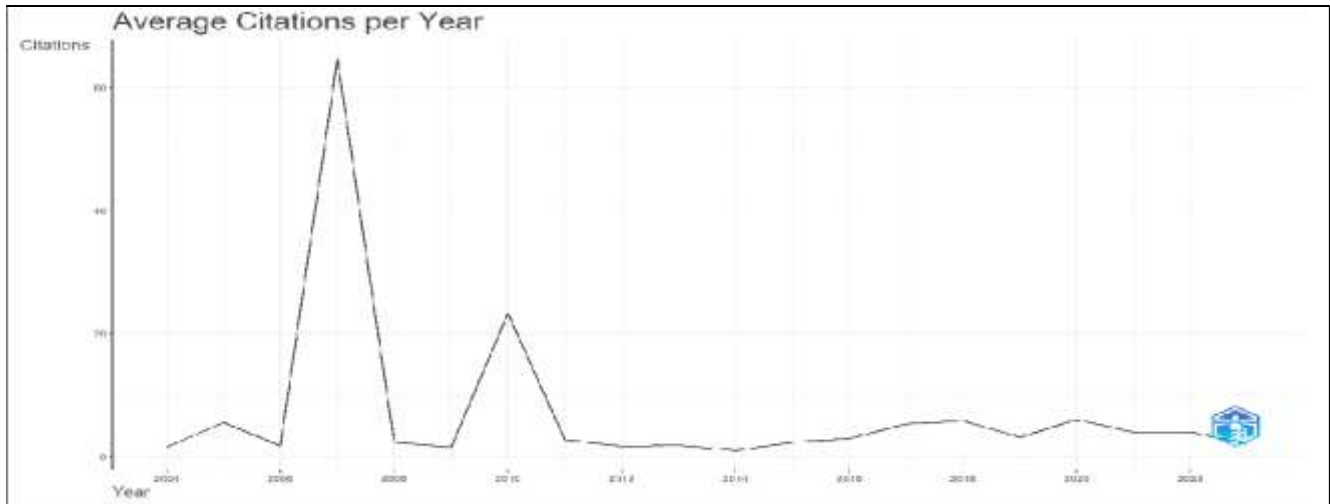
Figure 1 shows the annual number of publications on green entrepreneurship in the Scopus database. According to the data, there were only 6 articles published in 2004. A fluctuating trend on the topic was visible till 2013. Following that, a rising trend is seen from 2014 onwards.

3.3 Average citation per year

The average number of citations per year can be found by dividing the total number of citations by the number of years the author or publication has been publishing a paper. When evaluating the annual

impact of a journal, this indicator can be helpful.

Figure: 2 Annual citations per year



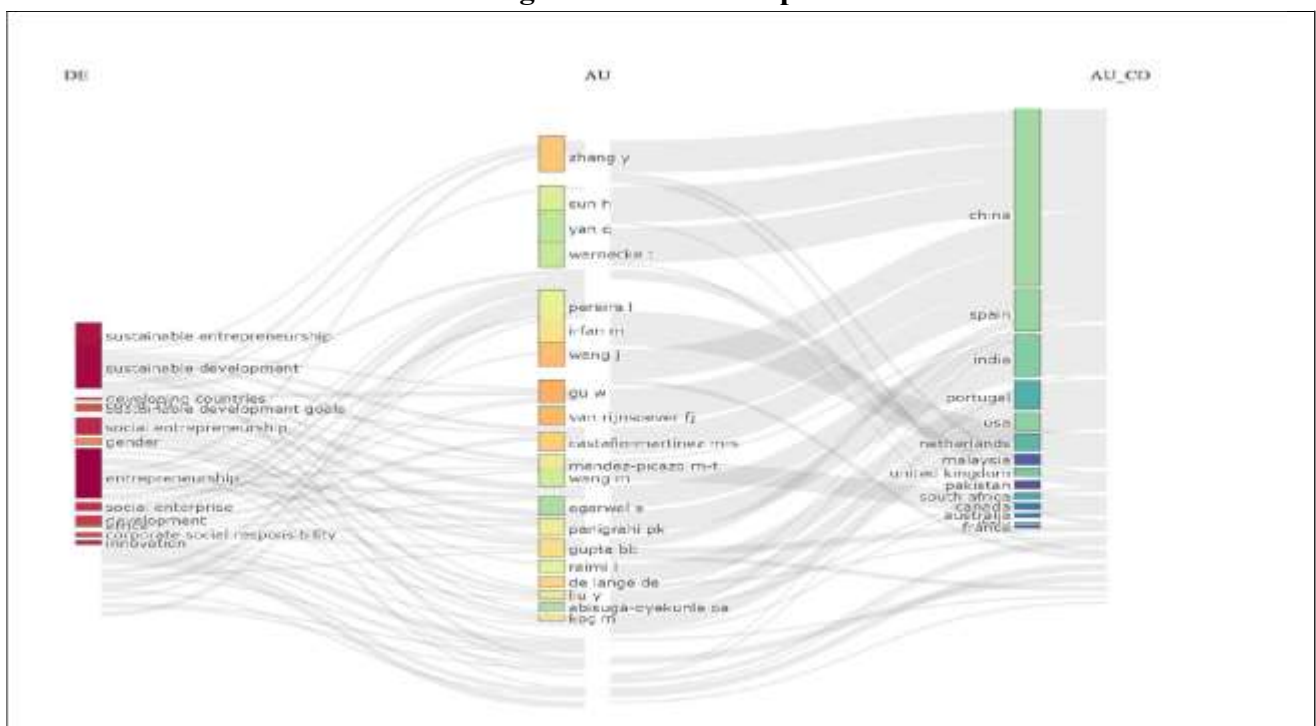
Source- Biblioshiny

Figure 2 shows the annual average number of citation for articles on green entrepreneurship. The average number of citation arises, peaking in 2007. Following that, it continued to be low average.

3.4 Three fields plot

In a field plot, any three fields (for example, author, keyword, and countries) can be chosen, and the three-field plot shows the key components and their relationship. The relevant parts are displayed by the rectangle's height. The higher the rectangle, the stronger the relationship between the elements.

Figure: 3 Three field plot



Source- Biblioshiny

Figure 3 displays a three-field plot diagram on green entrepreneurship that illustrates the relationship between the country (right), author name (center), and keyword (left). The grey line connecting the three components shows their relationship to one another (Rusydiana., 2021). The primary keyword used in the study is green entrepreneurship (24 items), sustainable development (24 items), sustainable entrepreneurship (11 items), and sustainable development goal (3 items), showing their connection with multiple countries.

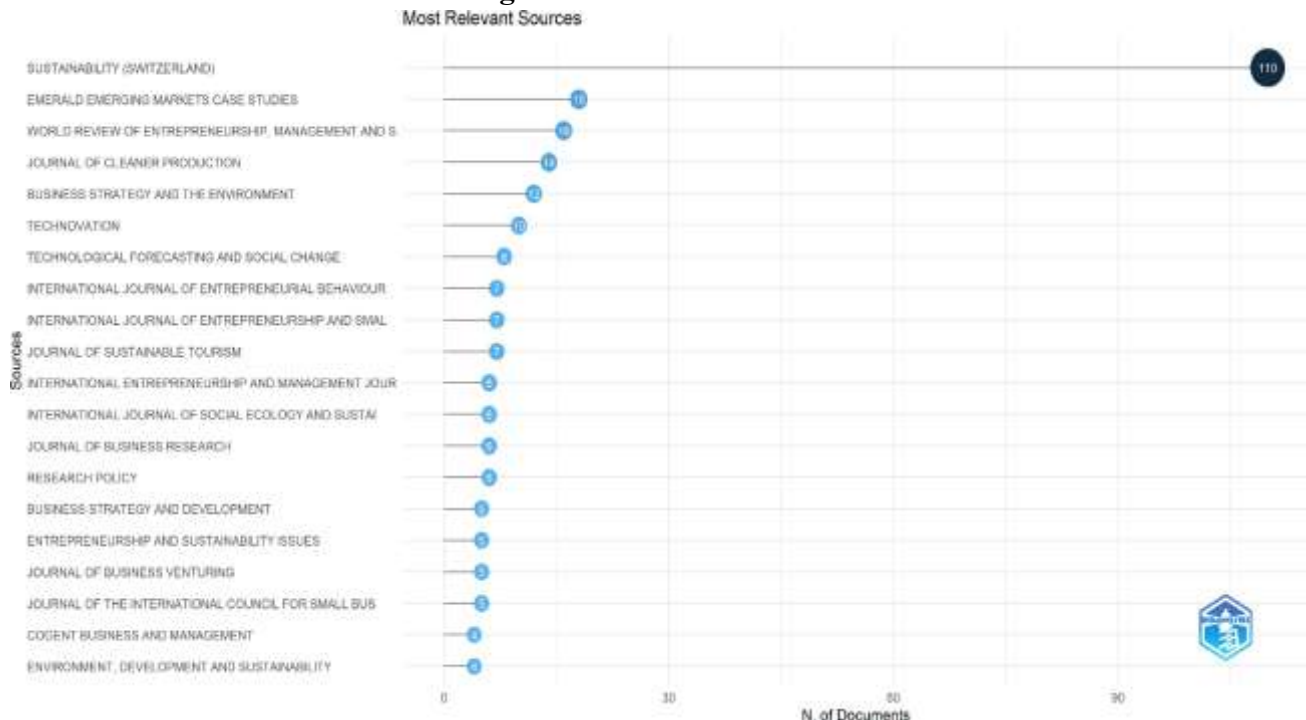
China, Spain, and India are the leading countries in the field, with Zhang, Waarneke t, and Yan Q among the top China authors.

4. SOURCES

Sources include journal, conference proceedings, books, etc., that publishes one or more articles in the bibliographic collection.

4.1 Most relevant sources

Figure: 4 Most relevant sources



Source- Biblioshiny

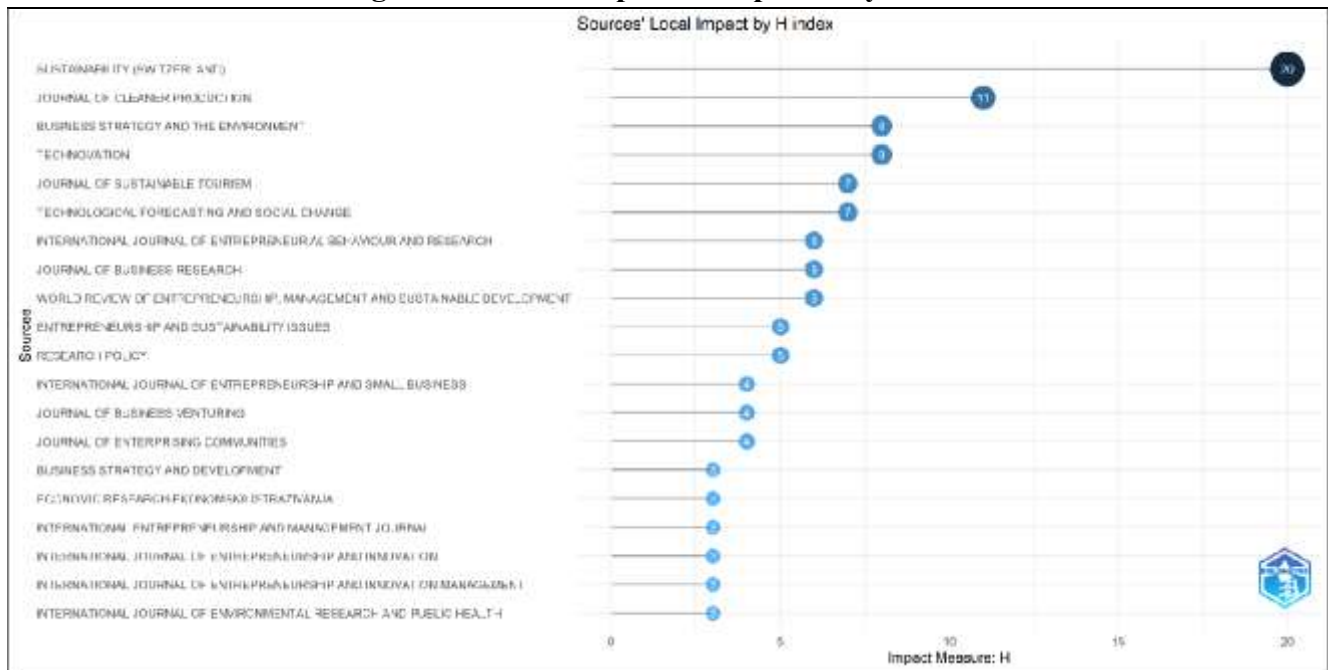
As per the data extracted, 590 research papers on Green Entrepreneurship were published in 110 journals from 2004 to 2024. As previously mentioned, Figure 4 shows the 20 pertinent sources from the period. The graph indicates that the Journal of Sustainability Switzerland has published the bulk of the 110 publications on green entrepreneurship, with 18 articles appearing in the Journal of Emerald Emerging Markets Case Studies and 16 articles in the World Review of Entrepreneurship, Management, and Sustainable Development Journal.

4.2 Source Impact

The H-Index of the journal offers quantifiable indicators of its impact factor. The Hirsch index, or H-index, is the total number of published articles (h) by a writer or journal that have each been cited at least h times in other papers. The study also determined the journal's h- index, which is displayed in a bar chart

in Figure 5.

Figure: 5 Source Impact of Top Twenty Sources



Source- Biblioshiny

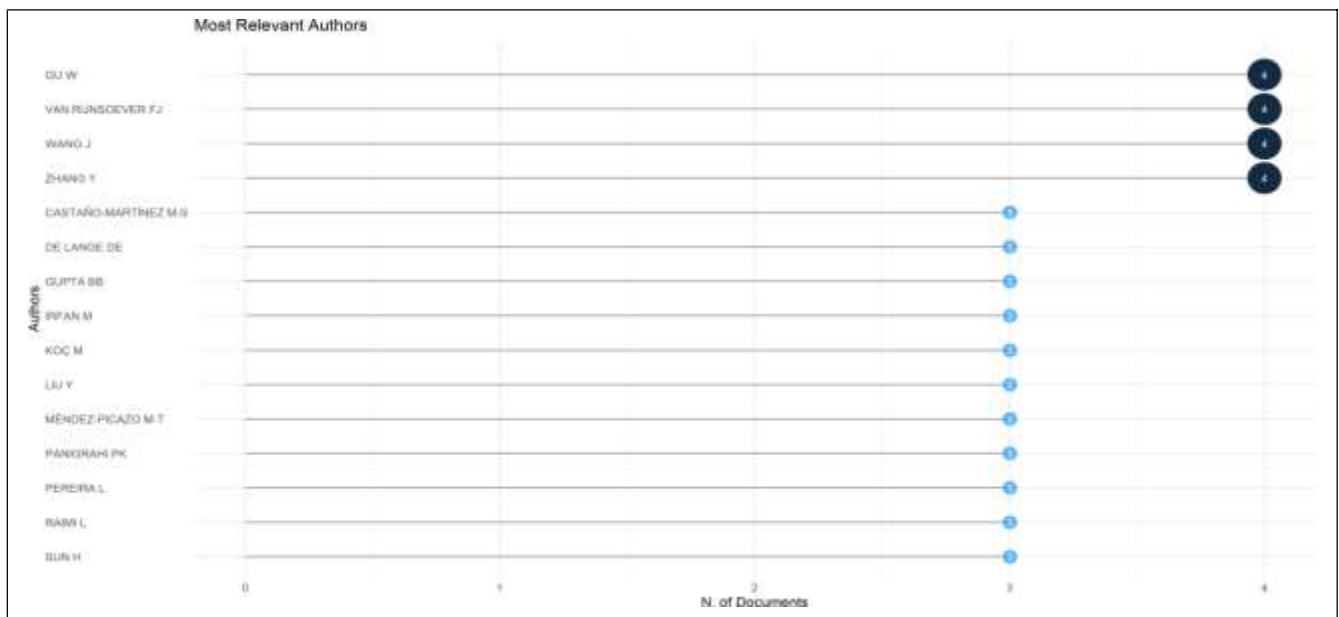
The three journals with the greatest impact are Sustainability Switzerland, Journal of Cleaner Production, and Business Strategy and The Environment, with respective H-Index values of 20, 11, and 8.

5. AUTHORS

5.1 Most relevant authors

With varying numbers of publications, 1627 authors have contributed to the study of green accounting. Figure 6 provides information on each author's total number of publications.

Figure: 6 Most relevant authors



Source- Biblioshiny

6. WORD ANALYSIS

6.1 Words Clouds

The word cloud created with a keyword plus shows the words in different sizes according to how often they have appeared in all publications. Despite the somewhat random word placement, the dominant position in the center is where they stand out due to their enormous size. Figure 7 shows the terms that were most frequently used in the publications on green entrepreneurship.

Figure: 7 Word Cloud



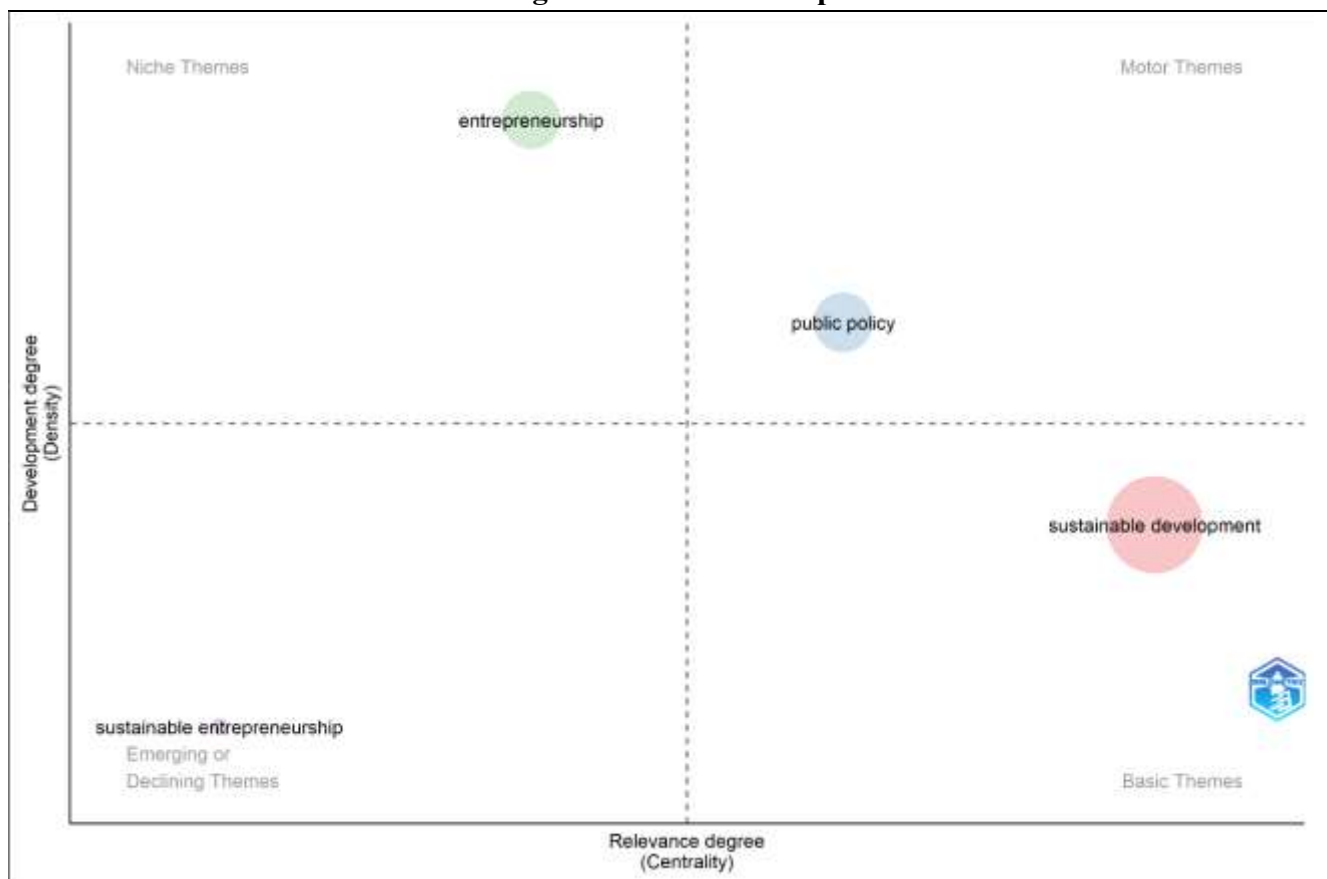
Source- Biblioshiny

The most often occurring word was sustainable development followed by entrepreneurs and entrepreneurship and so on.

7. THEMATIC MAP

This study also included a thematic map analysis that was divided into four topic quadrants based on centrality and density. The top right quadrant is a driving theme that needs further investigation and development because of its high density and centrality. “Public policy” is associated with this region (Figure: 8). Furthermore, the high density and low centrality of the upper left quadrant demonstrate a distinct and uncommon theme with high development. This area is appropriate for the entrepreneurship theme. In the lower right quadrant, high centrality but low density is the main theme. These themes should be included in the research since they are wide-ranging and commonly used topics. This group covers subjects like sustainable development. The emerging theme is sustainable entrepreneurship.

Figure: 8 Thematic Map



Source-Biblioshiny

8. CONCLUSION AND FUTURE RECOMMENDATION

In conclusion, the study's bibliometric analysis result shows that, in 2004, the field of green entrepreneurship started to gain importance. The study's findings also show that this pattern is irregular. China, Spain, and India are leading the way in green entrepreneurship research; among China's top writers Zhang, Waarneke t, and Yan Q. The top three journals that contain the greatest concentration of

articles on green entrepreneurship are Sustainability (Switzerland), Emerald Emerging Market Case Studies, World Review of Entrepreneurship, Management, and Sustainable development. The study's findings show that the number of publications has an up-and-down trend. This might be the green entrepreneurship is in the preliminary stage.

In the future, researchers should consider using more databases to conduct bibliometric analyses. In the future, these findings might be compared with findings from other databases.

REFERENCES

1. . N., & Anand, A. (2022). A Bibliometric Analysis of Green Accounting Research. *Journal of Commerce & Trade*, 17(1), 76–84. <https://doi.org/10.26703/JCT.v17i1-13>
2. Buffa, F., Franch, M., & Rizio, D. (2018). Environmental management practices for sustainable business models in small and medium sized hotel enterprises. *Journal of Cleaner Production*, 194, 656–664. <https://doi.org/10.1016/j.jclepro.2018.05.143>
3. Demirel, P., Li, Q. C., Rentocchini, F., & Tamvada, J. P. (2019). Born to be green: New insights into the economics and management of green entrepreneurship. *Small Business Economics*, 52(4), 759–771. <https://doi.org/10.1007/s11187-017-9933-z>
4. Drago, C., & Gatto, A. (2022). An interval-valued composite indicator for energy efficiency and green entrepreneurship. *Business Strategy and the Environment*, 31(5), 2107– 2126. <https://doi.org/10.1002/bse.3010>
5. Hall, J. K., Daneke, G. A., & Lenox, M. J. (2010). Sustainable development and entrepreneurship: Past contributions and future directions. *Journal of Business Venturing*, 25(5), 439–448. <https://doi.org/10.1016/j.jbusvent.2010.01.002>
6. Henkhaus, N., Bartlett, M., Gang, D., Grumet, R., Jordon-Thaden, I., Lorence, A., Lyons, E., Miller, S., Murray, S., Nelson, A., Specht, C., Tyler, B., Wentworth, T., Ackerly, D., Baltensperger, D., Benfey, P., Birchler, J., Chellamma, S., Crowder, R., ... Stern, D. (2020). Plant science decadal vision 2020–2030: Reimagining the potential of plants for a healthy and sustainable future. *Plant Direct*, 4(8), e00252. <https://doi.org/10.1002/pld3.252>
7. Kumar, A., & Kiran, D. P. (n.d.). *Green Entrepreneurship: A Bibliometric Study*.
8. Mondal, S., & Singh, S. (2023). A bibliometric and thematic analysis of green entrepreneurship in business research: Current status and future research directions. *Environment, Development and Sustainability*. <https://doi.org/10.1007/s10668-023- 03905-7>
9. Entrepreneurship education has gained significant attention, but the landscape of research publications in this field remains underexplored. This study aims to analyze entrepreneurship education publications from the Dimensions database, providing descriptive bibliometric insights through VOSviewer. The analysis covers country-coupled and organizational-coupled bibliographies from 2015 to 2024, along with keyword co-occurrence, document-coupled, and author-coupled bibliographies. VOSviewer was used to visualize and interpret the data. China leads with a link strength of 215,841 and 636 articles, followed by Indonesia with 579 articles. The State University of Malang is the most active organization with 49 articles. Wibowo shows the highest link strength (3,638), Narmaditya has the most publications (14), and Walmsley has the most citations (1,159). Top contributors by citations include Dhawan, Nabi, Nowiński, Neck, and Lassoued. Common themes identified are Innovation and Entrepreneurial Intentions. Although "Entrepreneurship Education" is not a dominant keyword, its varied forms reflect the field's complexity. This analysis

offers valuable insights into key contributors, trends, and thematic focuses in entrepreneurship education research, highlighting the dynamic nature and complexity of the field. Further research should address gaps and explore emerging themes to advance understanding and practice in entrepreneurship education.