



MAPPING THE LANDSCAPE OF INNOVATION AND SUSTAINABLE ENTREPRENEURSHIP: INSIGHTS FROM BIBLIOMETRIC ANALYSIS

Rajitna Balakrishnan, Assistant Professor, Department of Management Studies, Central University Of Kerala, Kasargod, Kerala-671320

Dr.Rehin KR, Head & Assistant Professor, Department of Management Studies, MG College, Iritty, Kannur University

Abstract

The growing urgency of environmental and social issues has led to a significant change in the field of entrepreneurship, resulting in the rise of sustainable entrepreneurship as a unique area of study. Initially, early efforts mainly focused on environmental problems. However, over time, there has been a noticeable shift towards including economic factors, recognizing that entrepreneurship can play a vital role in achieving sustainable development. This change has resulted in a dynamic approach that combines innovation, market trends, and individual entrepreneurial motivation to generate economic and social value through solutions that benefit both the environment and society. This study employs bibliometric analysis to explore the intersection of innovation and sustainability within entrepreneurship, mapping core research themes and identifying trends over time. The analysis encompasses 659 peer-reviewed articles to identify core research themes, influential scholars, and emerging trends. The study will identify the most impactful researchers and important publications in the field. It will also map out which countries are producing the most research on sustainable entrepreneurship. This information can guide where future research should focus to advance the field.

Keywords:

Innovation, Sustainable entrepreneurship, bibliometric analysis, citation analysis, entrepreneurship

Introduction

Early initiatives primarily addressed environmental issues. Over time, there was a shift towards integrating economic considerations, recognizing the potential for significant contributions to sustainable development. Bibliometric analysis is a powerful tool for understanding the landscape of research in a particular field. Bibliometric analysis can help identify emerging trends and research hotspots in entrepreneurship and sustainability. By analyzing citation patterns and co-occurrence of keywords, researchers can identify areas where further research is needed (Khan, A. I., Nawaz, F., & Ullah, S. (2022)(2). Bibliometric analysis can help identify suitable research methodologies for studying entrepreneurship and sustainability (Garg, S., & Kumar, S. (2023).

Traditional Social Entrepreneurship primarily aims to address social issues and create social value. The main objective is to solve problems such as poverty, education, and health care, often through innovative solutions that may not prioritize economic returns integrates social, environmental, and economic objectives. Sustainable entrepreneurship seeks to create economic value while simultaneously addressing social and environmental challenges, emphasizing a balanced approach to sustainability. This evolution culminated in the concept of sustainable entrepreneurship, which encapsulates the synergy between innovation, market dynamics, and individual drive to create economic and societal value through environmentally or socially beneficial solutions. It represents a transformative departure from traditional social entrepreneurship, ecopreneurship, and niche-focused sustainable innovation (Schaltegger & Wagner, 2011)(5).

Essentially, sustainable entrepreneurship is a dynamic approach that leverages market opportunities to address pressing environmental and social challenges, while generating economic returns. It is driven by individuals who possess a strong entrepreneurial spirit and a deep commitment to sustainability. Innovation policy has evolved through distinct phases. The first, emerging in the post-war period,



focused on government-led research and development (R&D) to drive economic growth(Schot & Steinmueller, 2018)(7).

The second phase, which is ignited by the globalizing economy of the 1980s, emphasized competitiveness. This era saw a focus on national innovation systems, fostering knowledge creation, commercialization, and entrepreneurial activity through networks and clusters(Schot & Steinmueller, 2018).More recently, the rise of pressing social and environmental challenges, as embodied by the Sustainable Development Goals, has ushered in a third phase. This phase demands transformative change, requiring a systemic overhaul of socio-technical systems, as theorized in sustainability transitions literature(Schot & Steinmueller, 2018)(7).

Objectives of the Study

- To systematically identify and map the core research themes and evolutionary trends within the intersection of innovation and sustainability in entrepreneurship.
- To conduct a comprehensive citation analysis to pinpoint periods of heightened research activity and intellectual breakthroughs in the field of innovation and sustainability entrepreneurship.
- To unveil the most influential scholars, seminal works, and leading journals shaping the discourse on innovation and sustainability within the entrepreneurial domain through a rigorous citation analysis.
- To delineate the geographic distribution of research output, identifying key countries and institutions driving advancements in innovation and sustainability entrepreneurship.
- To uncover knowledge gaps and unexplored avenues within the nexus of sustainability and entrepreneurship, informing future research directions.

A systematic literature review was conducted using the keywords "innovation" AND "sustainability entrepreneurship" within the subject area of Business Management and Social Sciences. This initial search yielded approximately 1419 documents. To refine the dataset, inclusion criteria were applied, limiting the scope to English-language and articles published in peer-reviewed journals. The articles in the publication stage were eliminated. The final dataset comprised 659 articles for in-depth analysis.

Keyword Analysis

The keyword analysis reveals that the most frequently used keywords are "entrepreneurship," "innovation," and "sustainability." These are followed by "sustainable development," "sustainable entrepreneurship," and "social entrepreneurship." Additional keywords with at least ten occurrences include "business model," "circular economy," "green entrepreneurship," "social innovation," and "sustainable innovation."

Table No:1 Key Word Occurrences and its link strength

Keyword	Occurrences	Total link strength
Business Model	19	35
Business Model Innovation	14	26
Circular Economy	17	24
Corporate Entrepreneurship	12	19
Corporate Social Responsibility	10	21
Corporate Sustainability	10	17
Creativity	11	21
Entrepreneurship	179	234
Entrepreneurship Education	11	15
Green Entrepreneurship	16	16
Green Innovation	10	10
Higher Education	13	17
India	11	21
Innovation	146	221

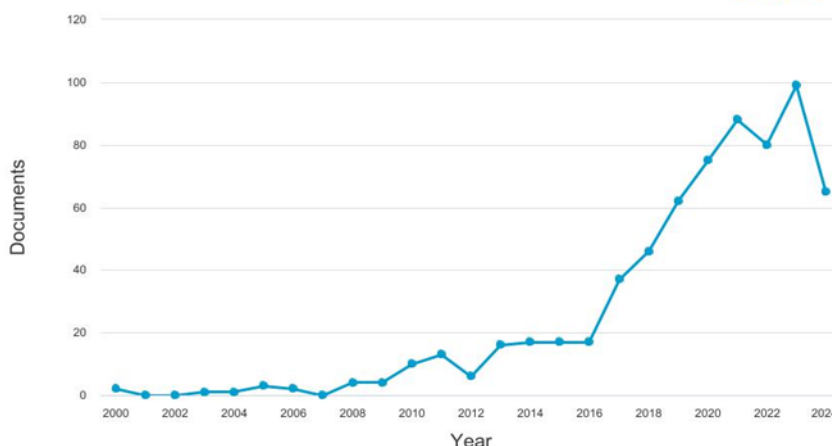


Fig 2: Documents by Year

The image presents a line graph titled "Documents by Year" with data sourced from Scopus. The x-axis represents the years from 2000 to 2024, and the y-axis represents the number of documents. The graph provides a visual representation of the increasing research output in the given field over the past two decades. Research in the area of sustainable development in entrepreneurship has gained significant interest and research activity since 2010. The reasons for the fluctuations in document numbers could be due to various factors such as research trends, funding availability, or global events. The recent peak in 2023 might indicate a surge of interest or new developments in the field.

Documents by Author

Schaltegger, S. has the highest number of documents among the listed authors. Schaltegger, S., and Wagner, M.'s paper titled "Sustainable Entrepreneurship and Sustainability Innovation: Categories and Interactions" has garnered significant academic attention, receiving 1124 citations. **Dressler, M.** and **Fichter, K.** have a similar number of documents, which is the second highest.

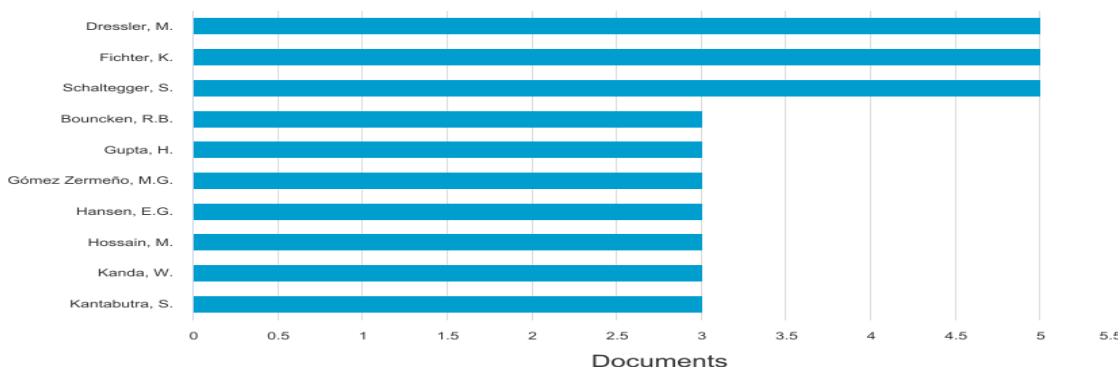


Fig3: Documents by Author

Documents per Year by Source

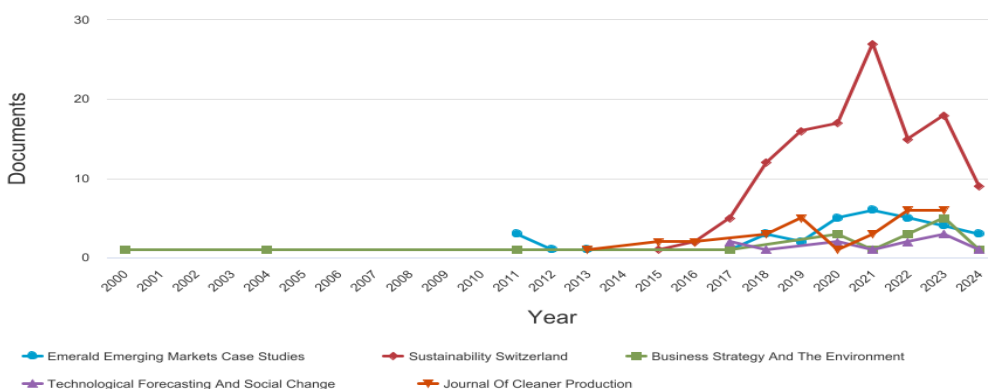


Fig 4 :Documents per Year by Source



Some journals like "Sustainability Switzerland," experienced rapid growth in recent years, while others, like "Emerald Emerging Markets Case Studies," have maintained a more stable publication rate. "Sustainability Switzerland" has the highest number of documents in recent years, suggesting it's a leading journal in its field. A noticeable spike in publications occurred around 2020-2021 for most journals, indicating a potential increase in research interest or focus during that period. The spike in publications around 2020-2021 could be attributed to factors such as increased research funding, global events (e.g., the COVID-19 pandemic), or new research directions.

CiteScore of Journals

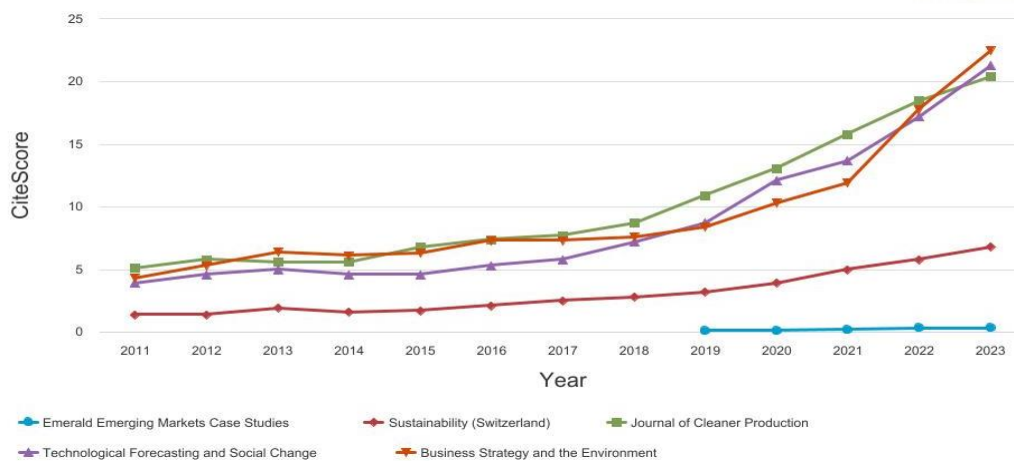
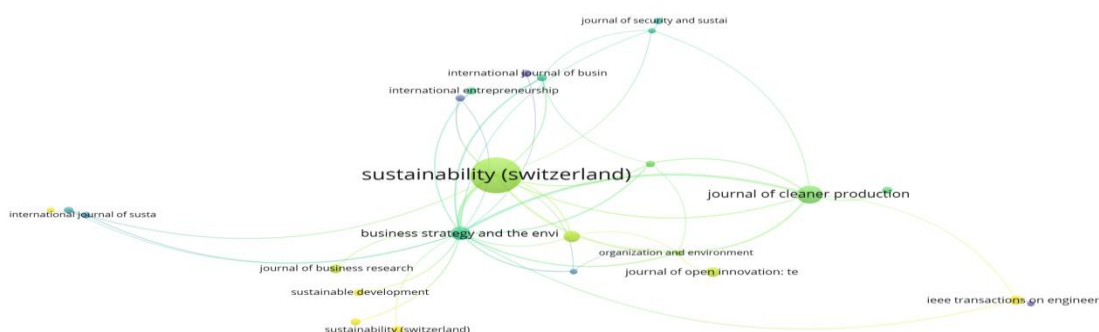


Fig 5: CiteScore of Journals

The chart depicts the citescore of these publications. **Journal of Cleaner Production** consistently exhibits the highest CiteScore throughout the analyzed period. It begins with a relatively high score in 2011 and steadily climbs, reaching its peak in 2023. **Sustainability (Switzerland)** journal demonstrates a similar upward trend to the Journal of Cleaner Production, though with a slightly lower CiteScore overall. It experiences notable growth between 2015 and 2023. **Technological Forecasting and Social Change** journal's CiteScore also follows an increasing pattern, but with a more gradual ascent compared to the previous two. It maintains a consistent trajectory throughout the analyzed period. **Business Strategy and the Environment** journal's CiteScore starts at a relatively low point in 2011 but shows a significant increase from 2015 onwards, converging with the trajectory of Technological Forecasting and Social Change by 2023. **Emerald Emerging Markets Case Studies** journal displays the lowest CiteScore among the five throughout the entire period. While it shows some fluctuations, the overall trend remains relatively stable with minimal growth. The most substantial CiteScore growth is observed in Sustainability (Switzerland) and the Journal of Cleaner Production, suggesting heightened interest and citation in these fields. Journal of Cleaner Production is consistently leading in terms of citation impact.



a) Overlay Visualisation



b) Density visualization

Fig 6: Citescore of Journals a) Overlay Visualisation b) Density visualization

Each circle represents a journal. In this case, we have several journals related to business, sustainability, and environmental research. The size of each circle generally indicates the number of citations or documents associated with that journal. Larger circles represent journals with more publications or citations. Journals like *Journal of Cleaner Production* and *Sustainability (Switzerland)* appear to be central to the network, suggesting they are highly cited and influential in the field.

Documents by funding sponsor

Scopus

Compare the document counts for up to 15 funding sponsors.

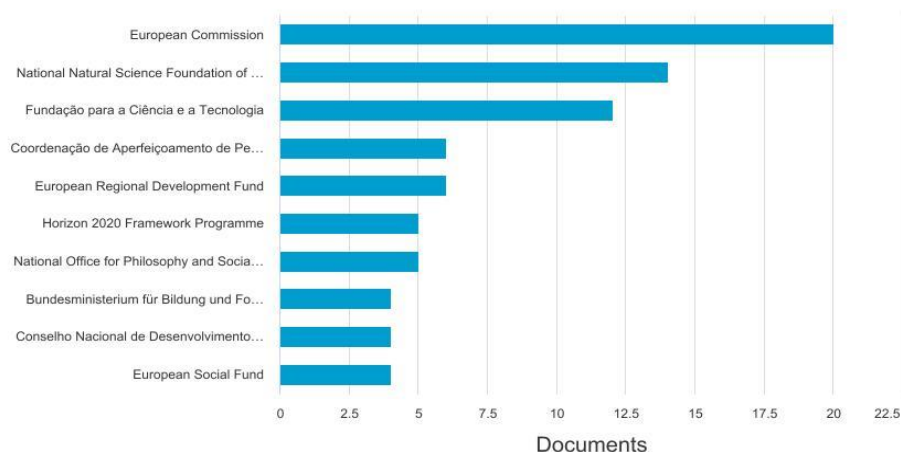


Fig 7: Documents by Funding sponsor

European Commission sponsor has the highest number of documents, with a count exceeding 22.5. **National Natural Science Foundation of** has the second-highest number of documents, with a count between 20 and 22.5. The third highest **Fundação para a Ciência e a Tecnologia** sponsor has the third-highest number of documents, with a count between 15 and 17.5.

Documents by Country

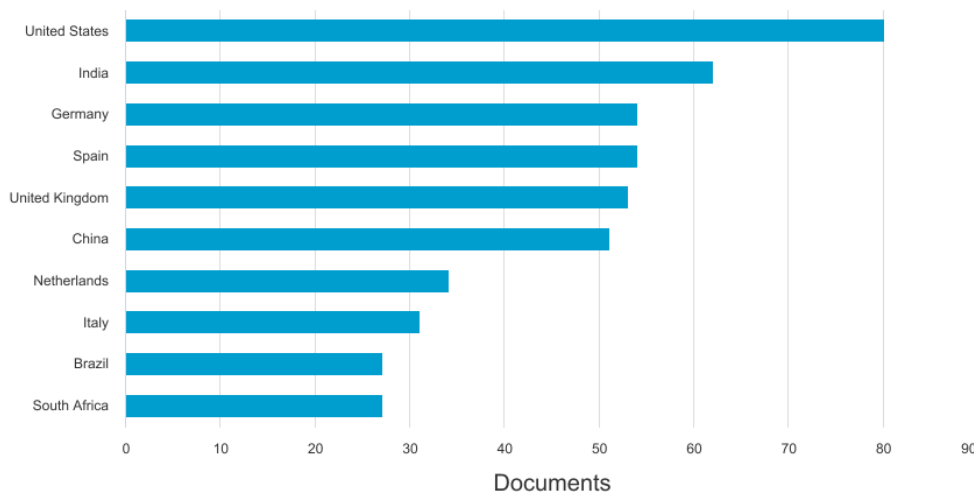


Fig 8: Documents by Country

The United States has the highest number of documents with account exceeding 80, followed by India with number of documents between 60-70 and Germany has the third-highest number of documents, with a count between 50 and 60. Spain has the fourth-highest number of documents, with a count between 40 and 50. The remaining countries (China, Netherlands, Italy, Brazil, and South Africa) have document counts below 40.

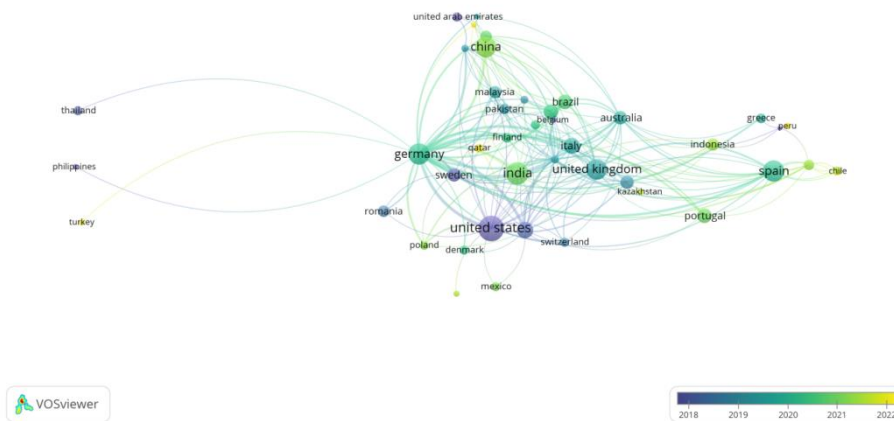


Fig 9: Documents by Country Network Visualisation

There seems to be a cluster of European countries (Germany, Sweden, Switzerland, etc.) with relatively strong connections among themselves. Another cluster includes countries from Asia (China, India, Malaysia, Thailand, etc.) with connections within the group.

Documents by Subject Area

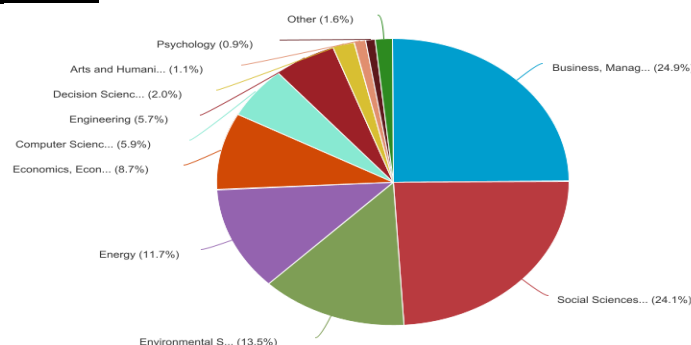


Fig 10: Documents by Subject Area

The chart represents the distribution of documents across different subject areas. Business, Management, and Accounting has the largest share of documents, accounting for 24.9% of the total. Social Sciences and Humanities is the second largest category, with 24.1% of the documents. Energy and Environmental Science are the next largest categories, with 13.5% and 11.7% of the documents, respectively. Other categories, such as Psychology, Arts and Humanities, and Decision Sciences, have smaller percentages of documents.

Citation Analysis

"Schot (2018)" and "Schaltegger (2011)," appear larger and have more connections, indicating these works are highly influential or cited works within the field. These authors or documents are most influential or central to the field. The weights here is based on the number of citations. The authors are "li (2019)", "Zhao (2005)", "hweenga(2010)", "etzion(2010)", "bartolacci(2020)", George(2021).

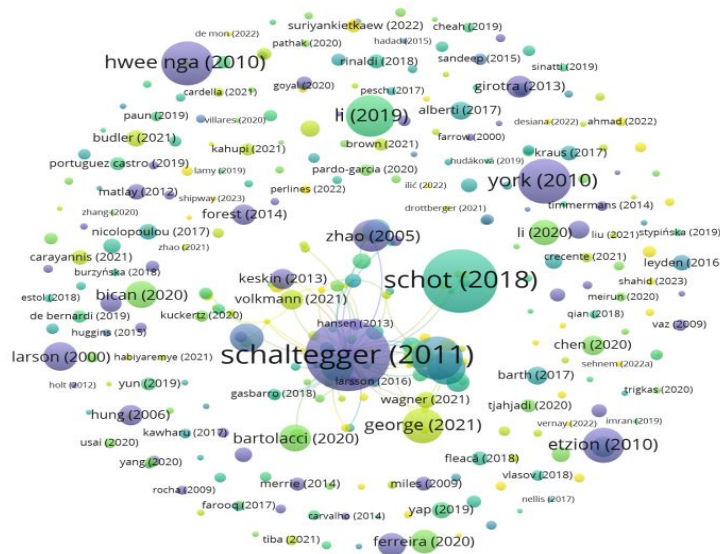
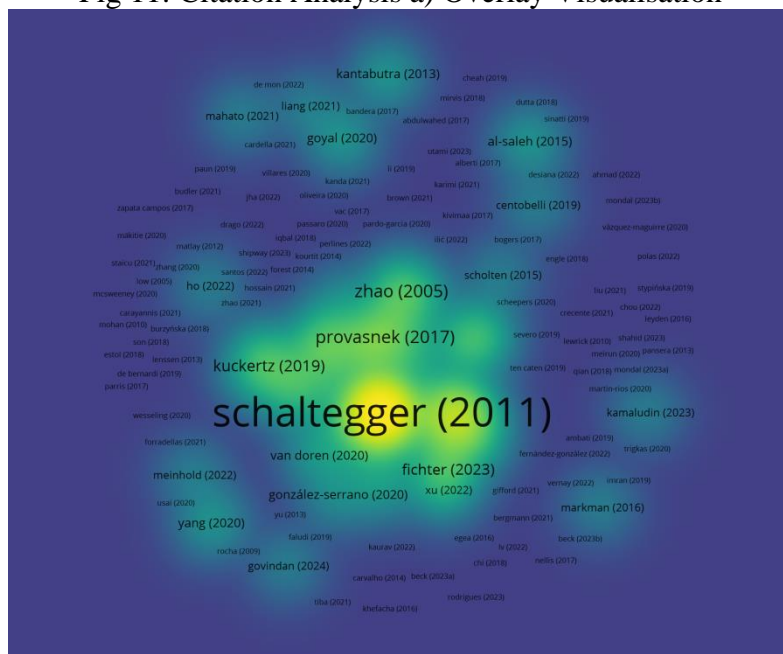


Fig 11: Citation Analysis a) Overlay Visualisation



c) Density Visualisation
UGC CARE Group-1

Connected authors

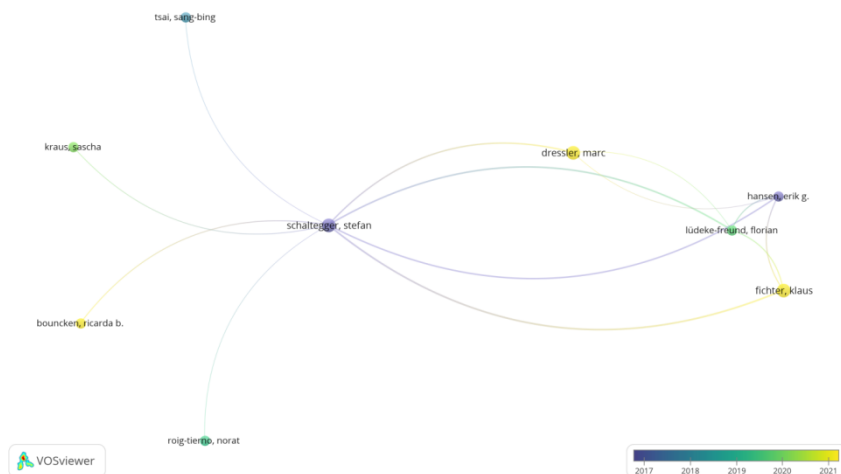


Fig12:Connected Authors

Coauthorship & Countries

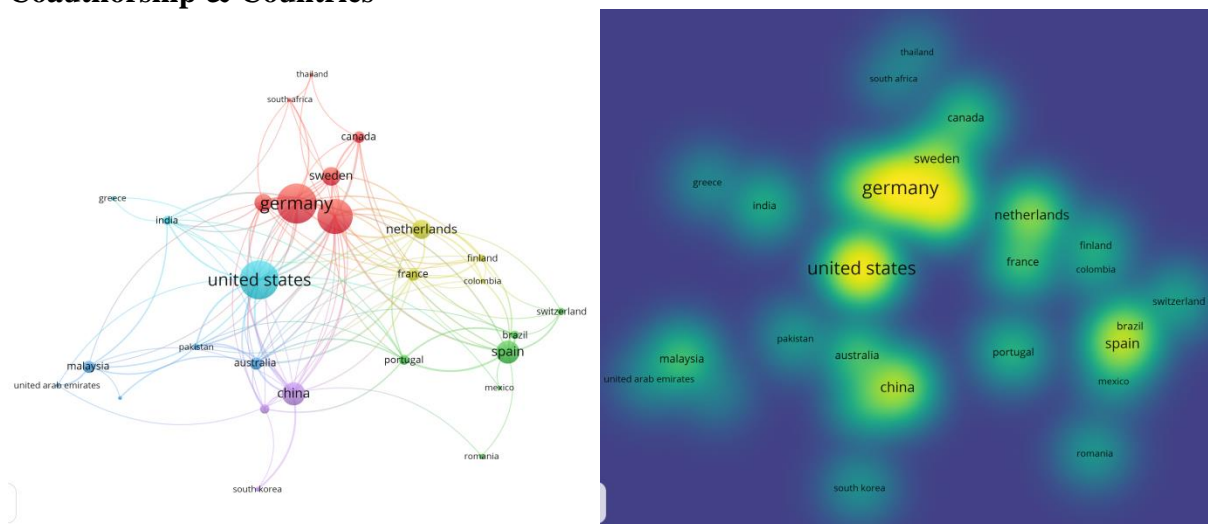


Fig 13 : Coauthorship by countries a)Network Visualisation b)Density Visualisation

Most of the coauthorship between countries looking into the size of the nodes is united states, ,germany,united kingdom,Spain & China where link strength is based on the citations. United States & germany are positioned as central hubs with numerous connections to other countries, suggesting they are highly collaborative in research.

Country	Documents	Citations	Total link strength
United States	80	2975	44
United Kingdom	53	2620	42
United Arab Emirates	10	181	5
Thailand	10	122	3
Switzerland	11	362	7
Sweden	23	1196	11
Spain	54	1582	27
South Korea	10	248	5
South Africa	27	129	7
Romania	16	284	2
Portugal	26	544	18
Pakistan	14	290	15
Netherlands	34	1250	27



value while simultaneously maintaining or regenerating natural, social, and economic capital beyond its organizational boundaries (Schaltegger et al., 2016). It's the sustainable entrepreneurs are individuals and companies that drive environmental and social progress through their core business activities. They incorporate sustainability into their value propositions, value creation, and value delivery, offering sustainable products to the mass market rather than limiting themselves to niche markets. This approach broadens the impact of sustainable practices and makes them accessible to a larger audience, promoting widespread environmental and social benefits (Schaltegger et al., 2016). Digitalization brings integration of digital technologies into everyday life and business processes. It encompasses everything from cloud computing and artificial intelligence to the Internet of Things (IoT) and big data. Digitalization enhances efficiency, improves decision-making, and can lead to new business models and opportunities. It encompasses environmental protection, social equity, and economic development. Key aspects include reducing carbon footprints, conserving resources, and promoting fair labor practices. This highlights how technology can drive sustainable practices and how sustainability can be supported through digital advancements (George et al., 2021).

Discussion and Conclusion

This study employed a bibliometric analysis to explore the intersection of innovation and sustainability within the realm of entrepreneurship. Citation analysis serves as a vital tool in pinpointing periods of heightened research activity in sustainable entrepreneurship by examining publication trends, citation frequencies, and the emergence of influential works. Through a systematic literature review encompassing 659 articles published in peer-reviewed journals, the research yielded valuable insights into the evolution of research trends, influential scholars, and key thematic areas.

The findings reveal a surge in research activity focusing on sustainable innovation and entrepreneurship, particularly since 2010. This aligns with the growing global concern for environmental and social challenges, underscoring the increasing recognition of entrepreneurship's role in driving positive change.

The analysis identified "Schaltegger & Wagner (2011)" as a highly influential work, laying the foundation for understanding the categories and interactions between sustainable entrepreneurship and innovation. Additionally, the prominent role of journals such as "Journal of Cleaner Production" and "Sustainability (Switzerland)" highlights the significance placed on research that bridges these domains.

Furthermore, the geographical distribution reveals a concentration of research efforts in the United States, Europe, and India, suggesting a need for greater international collaboration and research diversification in this expanding field. This suggests collaborative networks and highlights regions that are leading in sustainable entrepreneurship research. This geographical analysis can inform international collaboration efforts and research diversification.

Future Research

Building upon this foundation, several avenues beckon for future research:

- **Deep-dive into specific themes:** Exploring emerging sub-themes within the broader field, such as the role of social innovation in tackling specific sustainability challenges. While there is a growing body of literature, specific sub-themes within sustainable entrepreneurship, such as the role of social innovation, circular economy in addressing particular sustainability challenges, remain under-researched.
- **Impact analysis:** Investigating the tangible impacts of sustainable entrepreneurial ventures on environmental and social outcomes. There is a significant need for empirical studies that evaluate the tangible impacts of sustainable entrepreneurial ventures on environmental and social outcomes. Understanding the effectiveness of these ventures in achieving sustainability goals is crucial for validating their role in broader societal change.



• **Policy and regulation:** Examining the role of policy and regulatory frameworks in fostering or hindering the growth of sustainable entrepreneurship. Research exploring how different policy and regulatory environments influence sustainable entrepreneurship is limited. Investigating the effects of supportive versus restrictive policies can provide insights into how to foster sustainable entrepreneurial activities effectively.

Technological advancements: Evaluating the interplay between emerging technologies and sustainable entrepreneurship, and how they shape innovation trajectories.

Cross-cultural studies: Conducting comparative research across different geographical and economic contexts to understand the nuances of sustainable entrepreneurship in diverse settings.

Longitudinal studies: Employing longitudinal research designs to track and analyze the evolution of sustainable entrepreneurial ventures over time.

Future studies could explore specific themes within sustainable entrepreneurship, such as the impact of social innovation on sustainability challenges, the influence of policy frameworks, and the role of technological advancements in shaping entrepreneurial practices. By pursuing these areas of inquiry, researchers can further refine our understanding of the critical role innovation and entrepreneurship play in driving sustainable transformation and ensuring a prosperous future for our planet.

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