

Research Trends in Sustainable Entrepreneurship Based on Bibliometric Analysis of Scopus Publications for the Period 2012– 2024

Loso Judijanto
¹IPOSS Jakarta

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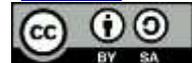
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ABSTRACT

Sustainable entrepreneurship has emerged as an important research domain that integrates entrepreneurial activities with environmental and social sustainability goals. The growing global concern regarding climate change, resource scarcity, and inclusive economic development has increased scholarly attention to this field. This study aims to analyze the development and research trends of sustainable entrepreneurship through a bibliometric approach. The analysis is based on publications indexed in the Scopus database during the period 2012–2024. Bibliometric techniques were employed using VOSviewer to visualize scientific collaboration networks and thematic structures within the literature. The results indicate a significant growth in publications related to sustainable entrepreneurship, reflecting increasing academic interest in the intersection between entrepreneurship and sustainable development. Co-authorship and country collaboration analyses reveal that research in this field is supported by international collaboration networks, with countries such as the United States, the United Kingdom, and India playing important roles in knowledge production. Keyword co-occurrence analysis shows that entrepreneurship, sustainable development, and sustainability form the core concepts of the research field, while emerging themes such as circular economy, sustainable development goals (SDGs), entrepreneurship education, and digital technologies indicate evolving research directions.

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Corresponding Author:

Name: Loso Judijanto

Institution Address: IPOSS Jakarta

e-mail: losojudijantobumn@gmail.com

1. INTRODUCTION

Sustainable entrepreneurship represents a fusion of two critical paradigms in contemporary business and societal studies: sustainability and entrepreneurial innovation. As global environmental challenges escalate alongside deepening socioeconomic inequalities, sustainable entrepreneurship has gained traction as a mechanism for not only creating economic

value but also addressing ecological and social concerns [1], [2]. Unlike traditional entrepreneurship, which primarily focuses on profit maximization, sustainable entrepreneurship integrates environmental stewardship and social responsibility into the core of business innovation, emphasizing long-term ecological wellbeing and societal welfare [3]. This transition underscores a broader reconfiguration of how

entrepreneurship is conceptualized, practiced, and evaluated within both academic and policy arenas.

The rise of sustainable entrepreneurship aligns with major global frameworks such as the United Nations Sustainable Development Goals (SDGs), which call for innovative approaches to eradicate poverty, ensure inclusive economic growth, and protect planetary health by 2030. Sustainable entrepreneurs are increasingly seen as essential agents for achieving these goals through the creation of novel business models, technologies, and practices that challenge conventional economic systems [3], [4]. Over the past decade, the concept has further expanded to include hybrid ventures, social enterprises, and impact-driven startups, reflecting the complex interplay between market-driven incentives and sustainability imperatives [5].

Despite the growing recognition of its importance, the evolution of research on sustainable entrepreneurship has been uneven, with studies emerging from diverse disciplinary backgrounds such as management, environmental science, economics, and innovation studies. This multidisciplinary expansion has enriched theoretical dialogues but has also resulted in fragmentation, with disparate conceptualizations and methodological orientations [6], [7]. For instance, some scholars emphasize entrepreneurial behavior in resource-constrained contexts, while others foreground ecological innovation or social value creation as central dimensions of sustainability-oriented entrepreneurship [5].

Bibliometric studies provide an effective lens to systematically map and interpret the development of research domains over time [8]. By analyzing publication trends, citation networks, and thematic clusters, bibliometric analysis enables researchers to uncover macro-level patterns that might be obscured in traditional literature reviews. In the context of

sustainable entrepreneurship, a bibliometric approach is particularly valuable for identifying emerging trends, influential scholars and institutions, dominant theoretical frameworks, and the evolution of key concepts across time [9]. Such insights can inform both scholars and practitioners about the state of the field, highlight knowledge gaps, and guide future research trajectories.

The selection of Scopus as the primary data source for this study is grounded in its comprehensive coverage of peer-reviewed research across disciplines, indexed journals, and high-quality conference proceedings. Scopus has been widely adopted in bibliometric research due to its extensive database, robust metadata, and integrated citation analysis capabilities. By focusing on publications indexed in Scopus from 2012 to 2024, this study captures more than a decade of scholarly activity during a period marked by heightened global focus on sustainability, climate action, and responsible innovation.

Although sustainable entrepreneurship has been increasingly studied, there is limited consensus on the developmental trajectory of the field, particularly regarding how research themes have evolved, which areas have gained prominence, and how scholarly collaborations have shaped knowledge production over time. Past reviews on sustainable entrepreneurship often rely on narrative and systematic literature synthesis, which, while insightful, lack the quantitative rigor required to map large-scale trends and citation structures. This gap inhibits a comprehensive understanding of how the field has matured, what intellectual foundations underpin it, and where opportunities exist for further exploration. Thus, there is a pressing need for a bibliometric investigation that systematically examines trends, thematic clusters, and research dynamics within sustainable entrepreneurship literature over a substantial period. The primary objective of this study is to conduct a comprehensive

bibliometric analysis of sustainable entrepreneurship research published in Scopus-indexed sources from 2012 to 2024.

2. METHOD

This study employs a quantitative bibliometric research design to systematically examine the development of sustainable entrepreneurship research between 2012 and 2024. Bibliometric analysis is widely recognized as a rigorous method for mapping scientific knowledge structures, identifying publication trends, and analyzing citation patterns within a particular research domain [8], [9]. Unlike traditional literature reviews that rely primarily on qualitative interpretation, bibliometric methods utilize statistical and network-based techniques to evaluate large volumes of scholarly data objectively. This approach enables the identification of influential publications, authors, institutions, countries, and thematic clusters, thereby providing a comprehensive overview of the intellectual evolution of sustainable entrepreneurship research over time.

The data for this study were retrieved from the Scopus database due to its extensive coverage of peer-reviewed journals, conference proceedings, and interdisciplinary

publications. The search was conducted using the keywords “sustainable entrepreneurship” and related terms within titles, abstracts, and keywords to ensure comprehensive coverage of relevant publications. The time frame was limited to the period 2012–2024 to capture recent developments aligned with increasing global attention to sustainability and the implementation of the Sustainable Development Goals. Only documents categorized as articles, reviews, and conference papers written in English were included to maintain consistency and academic quality. The collected bibliographic information included authorship details, publication year, journal source, citation counts, affiliations, and keywords. The analysis was conducted in several stages. First, science mapping techniques were applied to explore intellectual and conceptual structures through co-authorship analysis, co-citation analysis, and keyword co-occurrence networks. VOSviewer was employed to generate network maps and thematic clusters, allowing for clearer interpretation of relationships and emerging research streams.

3. RESULTS AND DISCUSSION

Co-Authorship Analysis

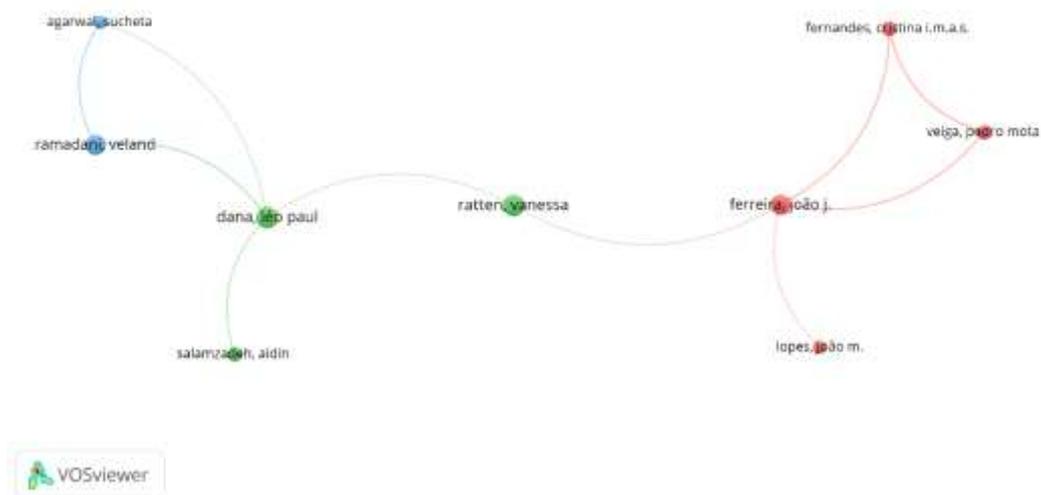


Figure 1. Author Visualization
Source: Data Analysis

Figure 1 illustrates the collaborative structure among scholars contributing to research on sustainable entrepreneurship. The map reveals several distinct collaboration clusters, indicating that research in this field is developed through relatively small but interconnected groups of authors. One cluster centers around Léo-Paul Dana, who appears as a key connecting node collaborating with scholars such as Aidin Salamzadeh and Vanessa Ratten, suggesting his important role in linking different research groups and themes within sustainable entrepreneurship studies. Another cluster includes João J. Ferreira, Cristina I. M. A. S. Fernandes, Pedro Mota Veiga, and João M. Lopes, indicating an

active collaboration network focused on related research topics. Additionally, a smaller collaboration group involving Veland Ramadani and Sucheta Agarwal can be observed, reflecting contributions from scholars who collaborate closely within their own sub-network. The presence of multiple clusters connected through several bridging authors indicates that sustainable entrepreneurship research is characterized by moderate collaboration and the emergence of influential researchers who connect different scholarly communities, contributing to the development and diffusion of knowledge within this field.

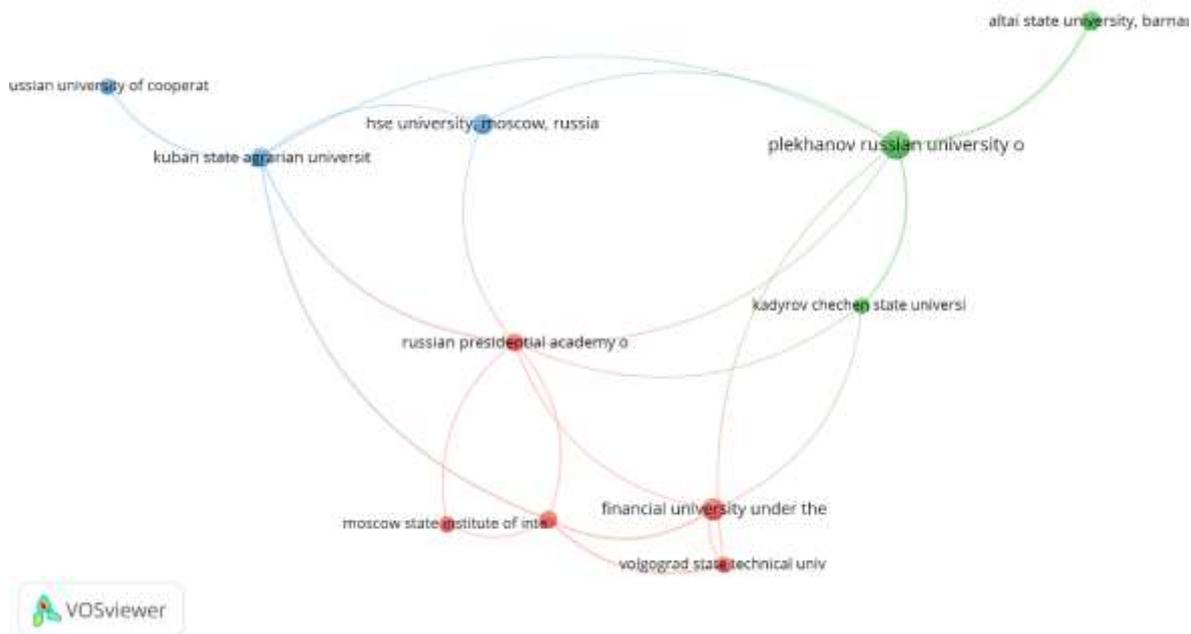


Figure 2. Institution Visualization

Source: Data Analysis

Figure 2 illustrates the collaboration patterns among universities involved in sustainable entrepreneurship research. The visualization shows several interconnected institutional clusters, indicating that knowledge production in this field is supported by collaborative relationships among academic institutions. Plekhanov Russian University of Economics appears as a central node within the network, connecting with institutions such as Altai State University

and Kadyrov Chechen State University, which suggests its significant role in facilitating institutional collaboration. Another important hub is the Russian Presidential Academy of National Economy and Public Administration, which links with institutions including the Financial University under the Government of the Russian Federation, Volgograd State Technical University, and the Moscow State Institute of International Relations, forming a dense collaborative

cluster. Meanwhile, HSE University in Moscow and Kuban State Agrarian University also demonstrate notable connections with other institutions, indicating their

involvement in cooperative research activities.

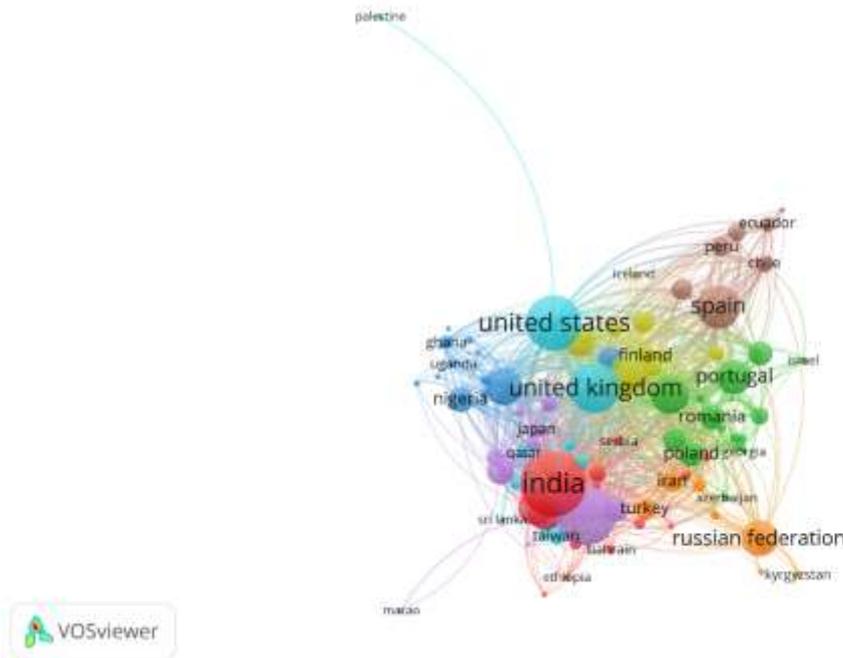


Figure 3. Country Visualization

Source: Data Analysis

Figure 3 illustrates the global distribution and cooperation patterns in sustainable entrepreneurship research. The map shows that the United States, United Kingdom, and India appear as major hubs with large nodes and extensive linkages, indicating their dominant contribution and strong international collaboration in this research field. The United States plays a central bridging role, connecting with numerous countries across different clusters, suggesting its influence in facilitating knowledge exchange and global research partnerships. Meanwhile, European countries

such as Spain, Portugal, Finland, Romania, and Poland form a closely connected cluster, reflecting strong regional collaboration within Europe. Another cluster highlights the Russian Federation and several surrounding countries, showing active research engagement in this area. Emerging participation from countries such as Iran, Turkey, and several Asian and African nations further demonstrates the expanding global interest in sustainable entrepreneurship studies.

Citation Analysis

Table 1. Top Cited Literature

Citations	Authors and Year	Title
2,141	[10]	The real-time city? Big data and smart urbanism
1,369	[11]	Three frames for innovation policy: R&D, systems of innovation and transformative change
1,163	[12]	A Positive Theory of Social Entrepreneurship
1,108	[13]	Sustainability-oriented innovation of SMEs: A systematic review
925	[14]	Business Models for Sustainability: Origins, Present Research, and Future Avenues

Beyond the central core, several surrounding themes appear with moderate density, including social entrepreneurship, sustainable development goals (SDGs), circular economy, entrepreneurship education, digital technologies, and social capital. These topics indicate important subthemes that support the broader discourse on sustainable entrepreneurship. Their presence suggests that scholars are increasingly exploring how entrepreneurship can address global sustainability challenges through innovation, education, and socially oriented business models. Meanwhile, less dense areas such as competition, investments, and engineering education indicate emerging or more specialized research areas that have received comparatively less scholarly attention but may represent potential directions for future research development.

Discussion

This study aimed to examine the development and intellectual structure of sustainable entrepreneurship research through bibliometric analysis of publications indexed in the Scopus database during the period 2012–2024. The results indicate that research in this field has grown significantly over the past decade, reflecting the increasing global attention to sustainability challenges and the role of entrepreneurial initiatives in addressing environmental and social issues. The growth of publications suggests that sustainable entrepreneurship has evolved into a multidisciplinary research area that integrates perspectives from entrepreneurship, sustainability science, innovation studies, and development economics. The increasing scholarly interest in this topic is closely linked to global agendas such as the United Nations Sustainable Development Goals (SDGs) and the rising demand for business models that balance economic performance with social and environmental responsibility.

The co-authorship analysis reveals that research collaboration in this field tends to occur within several interconnected research groups rather than a single dominant network. Certain scholars act as key connectors linking different clusters of researchers, which facilitates the diffusion of knowledge and interdisciplinary collaboration. The presence of multiple collaboration clusters suggests that sustainable entrepreneurship research is still developing and expanding across various academic communities. These findings highlight the importance of academic collaboration in advancing theoretical development and empirical investigation in this field. Collaborative research networks enable scholars to integrate different methodological approaches and disciplinary perspectives, which is particularly important for addressing complex sustainability challenges.

The institutional collaboration network further demonstrates that several universities serve as important hubs in producing and disseminating knowledge on sustainable entrepreneurship. The results show that research output is often concentrated within certain institutions that actively collaborate with other universities. Such institutional partnerships contribute to the development of joint research projects, exchange of expertise, and cross-institutional academic activities. The strong presence of several institutions within the network suggests that universities play a central role in shaping research agendas and promoting sustainability-oriented entrepreneurial studies. These collaborations also reflect the growing institutional commitment to sustainability-related research and education.

The country collaboration analysis highlights the global nature of sustainable entrepreneurship research. Countries such as the United States, the United Kingdom, and India emerge as major contributors to the field, demonstrating strong international

collaboration networks. The dominance of these countries may be associated with their well-established research infrastructures, extensive academic networks, and increasing policy attention to sustainability and innovation. At the same time, the participation of emerging economies indicates that sustainable entrepreneurship research is expanding beyond traditional research centers. The involvement of countries from different regions reflects the universal relevance of sustainability challenges and the global interest in developing entrepreneurial solutions for environmental and social issues.

The keyword co-occurrence analysis reveals the main conceptual structure of the field. The central position of keywords such as entrepreneurship, sustainable development, and sustainability indicates that these concepts form the core foundation of the research domain. These findings suggest that scholars frequently examine how entrepreneurial activities contribute to sustainable economic growth, environmental protection, and social development. The strong connections between these keywords demonstrate the interdisciplinary nature of sustainable entrepreneurship research, which integrates insights from business management, sustainability science, and social innovation studies.

Further analysis of thematic clusters indicates several important research directions within the field. One cluster focuses on entrepreneurship education and human capital development, including themes such as higher education, students, and entrepreneurial intention. This cluster suggests that researchers increasingly examine the role of educational institutions in fostering sustainable entrepreneurial competencies and mindsets. Another cluster highlights corporate sustainability and strategic management, including topics such as corporate social responsibility, circular economy, and business models. This reflects growing academic interest in how

organizations integrate sustainability principles into their operational strategies and innovation processes.

The overlay visualization indicates that research topics in sustainable entrepreneurship have evolved over time. Earlier studies tended to focus on foundational concepts such as sustainability and entrepreneurship, while more recent research has increasingly explored themes related to the circular economy, SDGs, empowerment, and environmental economics. This shift suggests that the field is moving toward more specialized and policy-oriented discussions that connect entrepreneurial activities with global sustainability frameworks. The emergence of these topics reflects the growing importance of integrating entrepreneurship with sustainable development strategies and environmental management practices. The density visualization confirms that the most concentrated research areas remain centered on the relationship between entrepreneurship and sustainable development. However, several emerging topics such as digital technologies, entrepreneurial ecosystems, and sustainability-oriented innovation are gaining increasing attention. These findings indicate that future research may focus on how technological advancement, institutional support systems, and collaborative ecosystems can accelerate sustainable entrepreneurial practices.

4. CONCLUSION

This bibliometric study examined the development of sustainable entrepreneurship research based on Scopus-indexed publications from 2012 to 2024. The findings reveal a significant growth of scholarly interest in this field, indicating that sustainable entrepreneurship has become an increasingly important research domain linking entrepreneurship with environmental and social sustainability goals. The analysis shows that research in this area is

characterized by expanding international collaboration, with several countries and institutions playing key roles in advancing the knowledge base. The co-authorship and institutional networks demonstrate that academic collaboration contributes significantly to the dissemination of ideas and interdisciplinary development within the

field. Furthermore, the keyword analysis highlights that entrepreneurship, sustainability, and sustainable development form the core conceptual foundation of the literature, while emerging themes such as the circular economy, SDGs, entrepreneurship education, and digital technologies indicate evolving research directions.

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