

Research on Circular Economy and Sustainable Entrepreneurship Based on Bibliometric Study

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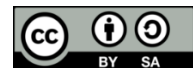
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ABSTRACT

This bibliometric analysis investigates the expansive domains of circular economy (CE) and sustainable entrepreneurship, focusing on their evolution and interlinkage within academic literature from 2000 to 2025. By leveraging data from Scopus and employing VOSviewer for visual mapping, the study identifies core themes such as innovation, sustainable development, and business model innovation, highlighting their prevalence and evolution over time. The analysis underscores the centrality of CE and sustainable entrepreneurship in fostering environmental sustainability and economic growth. Key findings indicate a strong emphasis on eco-innovation and the integration of corporate social responsibility into competitive business strategies. Despite significant advancements, the research landscape exhibits gaps, particularly in addressing socio-economic barriers and the full integration of social aspects within CE practices. The study not only maps the current intellectual terrain but also suggests future research directions aimed at addressing these gaps and enhancing the practical application of CE principles across different economic contexts.

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1. INTRODUCTION

The concept of a circular economy (CE) has emerged as a transformative approach towards sustainability, aiming to redefine growth by focusing on positive society-wide benefits. It entails gradually decoupling economic activity from the consumption of finite resources and designing waste out of the system. Underpinned by a transition to renewable

energy sources, the circular model builds economic, natural, and social capital by managing finite stocks and renewable flows [1]. This paradigm shift is crucial as the global economy continues to face the dual challenges of resource depletion and environmental degradation. Sustainable entrepreneurship, which combines the pursuit of economic objectives with the creation of environmentally and socially sustainable outcomes, aligns closely with the principles of

the circular economy. Entrepreneurs in this field innovate and exploit business opportunities that contribute to sustainability, thus playing a pivotal role in driving the transition towards a circular economy [2]. They not only aim to develop eco-friendly products and processes but also endeavor to create systems that promote resource efficiency and the closed-loop cycle of materials [3].

The linkage between the circular economy and sustainable entrepreneurship has been increasingly recognized in academic literature, yet it is complex and multifaceted. A bibliometric study can uncover the evolution of research themes and the interconnections between these two areas. Bibliometric analyses provide a quantitative approach to literature review, offering a systematic method to evaluate research trends, major themes, and knowledge gaps by analyzing large datasets of scholarly publications [4]. Despite the growing interest, there remains a substantial gap in comprehensive bibliometric studies that map the landscape of circular economy research within the context of sustainable entrepreneurship. Such studies are essential as they contribute to a deeper understanding of how theories evolve and intersect, and identify the most impactful ideas and authors in the field. The insights gained from these analyses can help scholars and practitioners to pinpoint emerging trends and shape future research directions that are crucial for policy development and business strategy formulation in the realm of sustainability.

While there is an increasing amount of research on both circular economy and sustainable entrepreneurship, there remains a lack of systematic integration of these fields in scholarly discussions. Existing studies often address these areas in isolation or with minimal cross-reference, leading to fragmented knowledge bases that fail to capture the synergistic potentials of integrating circular economy principles with sustainable entrepreneurial practices. Moreover, as the urgency to address sustainability challenges increases, there is a

critical need to synthesize existing research to better understand the intersections and divergences between these fields. This gap hinders the ability of policymakers, business leaders, and academics to formulate effective strategies that leverage the full potential of sustainable entrepreneurship within a circular economy framework. The objective of this study is to conduct a comprehensive bibliometric analysis of the existing literature on circular economy and sustainable entrepreneurship. This research aims to map the intellectual landscape, identify key themes and trends, and reveal the relational dynamics between these areas over time. By doing so, the study seeks to synthesize knowledge, uncover research gaps, and provide a structured overview that could inform future research, policy making, and strategic business decisions in fostering a more sustainable economic system.

Circular Economy: Origins and Evolution

The concept of a circular economy (CE) has evolved significantly over the past decades, tracing its roots to several sustainability-oriented theories such as the "cradle to cradle" design proposed by [5] and the "blue economy" concept described by [6]. The central tenet of CE is that resources should be reused, repaired, refurbished, and recycled for as long as possible, extending their lifecycle and minimizing waste [7]–[9]. In recent years, scholarly discussion has emphasized not only environmental but also economic and social benefits, proposing CE as a holistic approach to sustainable development [9], [10]. Researchers have also explored the operationalization of CE through various frameworks and models, examining the roles of innovation, business models, and policy environments in facilitating circular transitions. Notably, studies such as [11] have explored how companies can shift towards circular business models that are both profitable and sustainable, highlighting case studies where circular principles have led to significant competitive advantages.

Sustainable Entrepreneurship: Definition and Scope

Sustainable entrepreneurship stands at the convergence of business opportunity and the necessity for sustainable development, characterized by ventures that integrate economic, environmental, and social goals into their core business strategies. The domain has broadened from eco-entrepreneurship, focusing solely on environmental issues, to encompass a wider array of sustainability practices [12]. Scholars like [13] argue that sustainable entrepreneurs are not only driven by profit but also by a commitment to address social and environmental issues through innovative approaches. This section of the literature has grown to include various aspects such as the challenges and motivations of sustainable entrepreneurs, the impact of institutional and cultural contexts on their operations, and the outcomes of their ventures in terms of sustainability performance. Recent research has particularly focused on how these entrepreneurs measure and communicate the social and environmental impacts of their businesses, an area that has significant implications for policy and practice [14].

Integrating Circular Economy with Sustainable Entrepreneurship

The integration of CE principles with sustainable entrepreneurship is a relatively nascent but rapidly growing area of inquiry. Studies like [15] provide a conceptual framework for understanding how entrepreneurs can create value by adopting circular practices, such as through the development of new supply chains or by transforming waste streams into profitable business models. The research suggests that the circular economy offers a rich vein of opportunities for sustainable entrepreneurs, who can act as agents of change by implementing and spreading these principles. A critical examination by [16] discusses the mutual reinforcement between CE and sustainable entrepreneurship. The authors argue that for a circular economy to thrive, entrepreneurial ventures must innovate in areas such as material usage, resource efficiency, and waste management. Conversely, the circular economy framework

provides a blueprint that helps these ventures scale their operations sustainably, potentially leading to a paradigm shift in how businesses operate globally.

Bibliometric Analyses in Circular Economy and Sustainable Entrepreneurship

Bibliometric studies provide a meta-analysis of existing literature, revealing trends, gaps, and the evolution of research themes. In the context of CE and sustainable entrepreneurship, bibliometric analyses have been instrumental in mapping the scholarly landscape and identifying dominant theories and methodologies. For instance, [17] conducted a comprehensive bibliometric analysis on the circular economy, which helped to pinpoint the most influential studies, authors, and journals that shape the discourse around CE. Similarly, bibliometric reviews in sustainable entrepreneurship have highlighted the increasing convergence of entrepreneurship and sustainability topics, showcasing a growing but still fragmented body of literature [18]. These reviews are essential for understanding how research in sustainable entrepreneurship is evolving and intersecting with broader sustainability and business discussions.

2. METHODS

This study conducts a bibliometric analysis to investigate the intersection of circular economy (CE) and sustainable entrepreneurship using data sourced exclusively from the Scopus database. We will utilize a search strategy that includes terms like "circular economy," "sustainable entrepreneurship," "resource efficiency," and "sustainability innovations," applying filters to select publications from the year 2000 to 2025 to ensure relevance and contemporaneity. The dataset will be refined to include only English-language scholarly articles, capturing core developments and thought leadership within these fields. Data such as authors, publication year, citations, journal name, and keywords will be extracted for analysis. Employing VOSviewer, we perform co-citation and keyword co-

occurrence analyses to visually map the networks of knowledge, identify major research clusters, thematic concentrations, and the evolution of research trends over the specified period.

3. RESULTS AND DISCUSSION

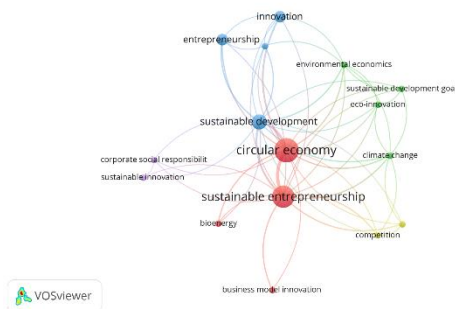


Figure 1. Network Visualization

Source: Data Analysis, 2025

The network visualization reveals several interconnected clusters of keywords, each representing a core theme within the literature on circular economy and sustainable entrepreneurship. At the center, "circular economy" and "sustainable entrepreneurship" appear as pivotal nodes, indicating their centrality and the dense interconnections with other research topics. This central positioning suggests that these concepts are not only highly relevant by themselves but also act as a bridge connecting various sub-themes such as "innovation," "sustainable development," and "business model innovation." The cluster including "innovation" and "entrepreneurship" closely ties with "environmental economics" and "sustainable development goal," suggesting a strong focus on innovation-driven economic strategies that align with sustainable development objectives. This indicates a scholarly emphasis on how innovative practices within businesses and economies can contribute to broader environmental goals. Additionally, the presence of "eco-innovation" within this cluster highlights a specific interest in innovations that directly enhance ecological outcomes.

The keywords "corporate social responsibility" (CSR) and "competition" are linked, indicating research into how CSR

initiatives can influence competitive dynamics within industries. This connection may reflect an exploration of how sustainable practices impact market competition or how businesses can leverage CSR as a competitive advantage. The integration of "sustainable innovation" and "bioenergy" within the network suggests a cross-disciplinary approach that spans from technological innovations in energy to their applications in sustainable business practices. The presence of "climate change" within the network, connected to "sustainable development" and "circular economy," underscores the critical role of environmental concerns in shaping research and practices within these fields. It highlights the urgency of addressing climate change within the frameworks of economic and entrepreneurial activities, reflecting an academic and practical focus on developing sustainable business models that are responsive to current and future environmental challenges.

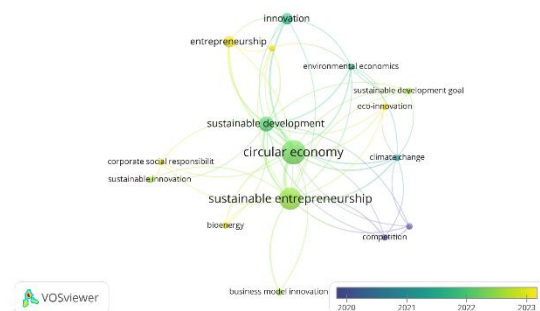


Figure 2. Overlay Visualization

Source: Data Analysis, 2025

The visualization indicates a clear evolution in the research focus from 2020 to 2023, with newer themes such as "competition" emerging more prominently in the later years. This suggests a shift towards examining the competitive aspects of sustainable entrepreneurship, possibly reflecting a growing interest in how businesses can sustainably differentiate themselves in a competitive market. The gradual growth in the significance of "business model innovation" over the period suggests increasing scholarly interest in how innovative business models can drive the integration of circular economy principles into mainstream business practices.

Throughout the period from 2020 to 2023, "circular economy" and "sustainable entrepreneurship" remain central, underscoring their continued importance as foundational concepts within the research community. The consistent links to "sustainable development" and "innovation" across the timeline highlight a sustained focus on these areas, emphasizing the role of innovation in achieving sustainable development goals. Notably, the connection between "circular economy" and "climate change" remains strong, reflecting ongoing concerns about the environmental impacts of economic activities and the role of circular principles in mitigating these impacts.

In the more recent years of the timeline, there appears to be a burgeoning interest in the intersection of "eco-innovation" and environmental economics, suggesting a nuanced approach to understanding the economic underpinnings of environmental innovation. The presence of "bioenergy" in the network, while not as central as other themes, indicates an exploratory focus within the renewable energy sector, which is likely to gain more prominence as research continues to explore sustainable alternatives to conventional energy sources. The visualization also shows that as of 2023, there is an increasing integration of diverse but related themes, pointing towards a multidisciplinary approach in future research agendas.

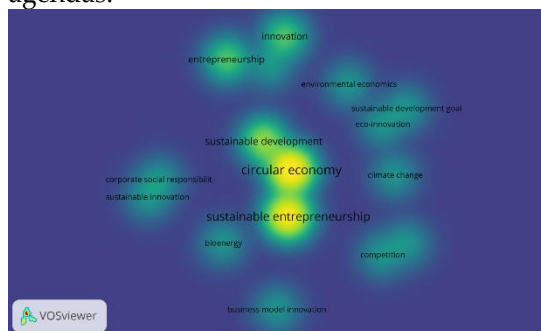


Figure 3. Overlay Visualization
Source: Data Analysis, 2025

The visualization using VOSviewer presented here illustrates the density and intensity of research topics within the realms of circular economy and sustainable entrepreneurship. The density map reveals

how areas like "circular economy," "sustainable development," and "sustainable entrepreneurship" are hotspots of research, indicating a high concentration of scholarly activity. This suggests that these areas are not only central to the discussion but also highly interconnected with emerging themes such as "business model innovation" and "eco-innovation," which appear vibrant, underscoring their growing importance in recent research. Additionally, the gradient of colors from blue to yellow highlights the varying intensity and connectivity of topics. The brightest areas—where yellow and green converge—center around "circular economy" and "sustainable entrepreneurship," demonstrating that these are not only active research areas but also pivotal points linking other themes like "innovation," "corporate social responsibility," and "climate change." This suggests a multidisciplinary approach in current research, emphasizing the integration of sustainability with economic and business model innovations. The presence of "competition" and "bioenergy" at the peripheries implies these are emerging areas that may see increased scholarly focus as the fields continue to evolve and respond to global sustainability challenges.

Co-Authorship Network

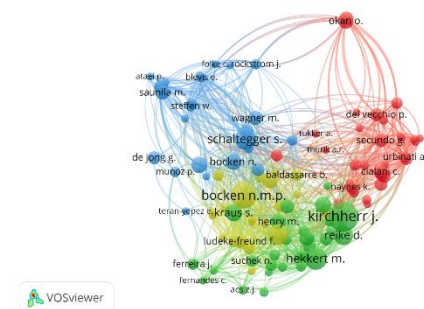


Figure 4. Overlay Visualization
Source: Data Analysis, 2025

The VOSviewer map provided illustrates the scholarly network and collaboration patterns among researchers in the field of circular economy and sustainable entrepreneurship. Each node represents an author, with node size indicating the relative citation impact or productivity of the researcher within the network. The various colors denote different clusters or research

groups that likely collaborate closely or focus on similar sub-themes within the broader topics. For instance, the dense clusters in blue and green might represent groups specializing in foundational theories of circular economy and practical applications of sustainable entrepreneurship, respectively. Key figures like Bocken N.M. and Kirchherr J. appear centrally located, suggesting they are pivotal in their respective clusters, likely contributing foundational research and bridging diverse research streams. The lines connecting the nodes indicate co-authorships or citation relationships, underscoring the collaborative nature of research in these fields and highlighting influential works that might serve as a nexus for future studies.

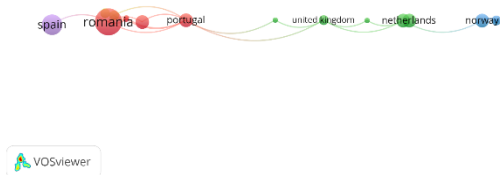


Figure 5. Country Visualization

Source: Data Analysis, 2025

The VOSviewer visualization showcases the network of countries based on their collaboration or research impact within a specific academic field, possibly related to circular economy and sustainable entrepreneurship. The map illustrates six countries—Spain, Romania, Portugal, the United Kingdom, the Netherlands, and Norway—each represented by a node whose size may reflect the volume or impact of research activity in each country. The proximity of Romania to Portugal suggests a higher degree of collaboration or similarity in research focus between these two countries compared to others. Meanwhile, the linear arrangement from Spain through to Norway, with gradually diminishing node sizes, could imply a spectrum of research contribution or connectivity, with the United Kingdom, the Netherlands, and Norway showing potentially close ties in research themes or collaborations. This visual arrangement

highlights the geographical and intellectual landscape across Europe regarding their contributions to the field, with varying degrees of interconnectedness that could influence future cooperative efforts or research directions.

DISCUSSION

The bibliometric analysis conducted in this study provides a comprehensive overview of the evolving landscape of research concerning circular economy (CE) and sustainable entrepreneurship. The data reveals robust thematic clusters around innovation, sustainable development, and business model adaptation, which are central to integrating sustainability principles into core business strategies. The predominance of "circular economy" and "sustainable entrepreneurship" as focal points in the literature underscores their critical role in driving the transition towards sustainable practices within various industries. Innovation emerges as a recurring theme, linked significantly with "environmental economics" and "sustainable development goals." This connection likely reflects an ongoing shift in scholarly attention towards developing economic models that not only support but also drive environmental and social sustainability. The focus on "eco-innovation" within the research suggests that technological and process innovations are viewed as key mechanisms by which companies can reduce environmental footprints while maintaining economic competitiveness.

The findings highlight the importance of interdisciplinary approaches in researching CE and sustainable entrepreneurship. The intersection of "corporate social responsibility" (CSR) and "competition" points towards a growing academic interest in how sustainability is integrated into corporate strategies and how it impacts competitive advantage. This is particularly relevant for practitioners and policymakers as it provides insights into how businesses can leverage CSR not just as a compliance or marketing strategy but as a core part of competitive strategy in

sustainability-driven markets. Moreover, the strong link between "circular economy" and "climate change" suggests that CE practices are increasingly being recognized as vital responses to global climate challenges. For policymakers, this emphasizes the need for regulations that encourage or mandate circular practices, particularly in high-impact industries. For businesses, the focus on CE implies that there is both a market and a regulatory push towards adopting business models that are not only efficient but also environmentally beneficial.

While the research landscape is rich and diverse, the bibliometric analysis also uncovers gaps and limitations within the existing body of literature. One notable gap is the limited exploration of the socio-economic barriers to implementing circular economy principles, particularly in less developed economies. This suggests a need for more focused research on the challenges faced by businesses in these regions, which could differ significantly from those encountered in more developed economies. Additionally, the analysis suggests that while there is extensive literature on the environmental and economic aspects of CE and sustainable entrepreneurship, there is less focus on the social dimensions. This includes research on labor impacts, community engagement, and the role of social equity in circular and sustainable business practices. Addressing these gaps could provide a more holistic understanding of the implications of these practices and help in designing more inclusive policies and business models.

Based on the findings and existing gaps, several future research directions are recommended. First, there is a clear need for empirical studies that investigate the practical challenges and successes of implementing CE models across different industries and regions. Such studies could help identify best practices and common obstacles, providing a roadmap for more effective implementation of CE principles. Second, future research could benefit from a more granular analysis of the role of technology in enabling sustainable entrepreneurship. While "eco-innovation" is a

noted theme, the specific technologies, their adoption rates, and their impacts on sustainability metrics remain under-explored. Studies focusing on these aspects could significantly advance understanding of the operational dynamics of sustainable businesses. Third, interdisciplinary research combining insights from environmental science, economics, and social sciences could enrich the understanding of how circular and sustainable practices can be integrated into broader societal goals. This includes exploring how these practices intersect with public health, urban planning, and poverty reduction strategies. Comparative studies examining the differences in CE adoption and its impacts across various geopolitical contexts could provide valuable insights into how policy, culture, and economic status influence the effectiveness of sustainable practices. Such studies would be crucial for tailoring strategies that are not only globally informed but also locally applicable.

4. CONCLUSION

This bibliometric analysis has elucidated the intricate landscape of research surrounding circular economy and sustainable entrepreneurship, revealing a robust focus on innovation, sustainable development, and strategic business modeling. The study underscores the critical role of circular economy principles and sustainable entrepreneurship practices in addressing contemporary environmental challenges and fostering economic sustainability. Despite the richness of the discourse, gaps remain, particularly in the socio-economic dimensions and practical implementation challenges in varying regional contexts. Future research should address these gaps by exploring the socio-economic barriers, the role of technology, and the integration of social dimensions into circular economy practices. By broadening the scope of investigation and incorporating diverse geopolitical perspectives, the academic community can further contribute to the development of effective strategies that

are both sustainable and globally adaptable, thereby supporting the transition towards a more sustainable future.

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