Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

Navigating the Sustainable Business Model: A Comprehensive Bibliometric Analysis at the Intersection of Circular Economy and Innovation Management in the Era of the Fourth Industrial Revolution

Zohreh Ali Esmaeili[1], Yaser Sobhanifard[2]

Abstract

This study aims to comprehensively analyze the Intersection of the circular economy and innovation management during the fourth industrial revolution, uncovering evolving trends and influential contributors. Using the Biblioshiny web app, this pioneering research conducts a bibliometric analysis to review the Circular Economy and innovation management literature, quantify scientific output, and identify mathematical advances. This study provides quantitative insights into the progress of circular economy research and innovation management toward creating sustainable business models and provides a map of evolving trends, thematic developments and influential contributors. The practical implications of these findings offer businesses and managers valuable insights and guide them through fundamental, driving, and emerging thematic trends. It also advises them to focus on motor and basic themes for strategic decision-making in designing sustainable business models.By fostering active engagement with evolving trends, this research contributes to the ongoing circular economy and innovation management discourse, potentially leading to social well-being, prosperity, and progress.This pioneering study is an in-depth bibliometric analysis of the Intersection of circular Economy and innovation management, which provides unique insights and quantitative assessments of scientific outputs and thematic trends and improves the orientation of innovation management toward sustainable circular rather than linear models. Therefore, it adds considerable value to the existing literature.

Keywords: *Circular Economy, Innovation Management, Sustainable Business Model, Bibliometric Analysis, Thematic Analysis.*

Introduction

While the Industrial Revolution 4.0 enters its increasing growth path with technological innovations, the interaction of the Circular Economy (CE) as a pattern of sustainable production and consumption with innovation management (IM) can be a critical juncture for the future, especially in defining the sustainable business model in the current Industrial revolution 4.0. Although technological innovations and emerging technologies based on artificial intelligence, such as catalysts, advance the journey of industrial revolution 4.0 with increasing momentum and empower companies to create a circular economy (CE) model, design circular products and optimize circular infrastructure (Stavropoulos et al., 2021, Suchek et al., 2021). However, due to their multifaceted nature, technological innovations can disrupt the creation of a circular economy and continue to move businesses along a linear path. So, innovation without considering its consequences can pollute the earth's ecosystem or reduce the quality of collective life. For example, it is estimated that the world is only 7.2% circular, which means it has decreased compared to the 9.1% growth of the last five years, mainly due to the increase in the extraction of virgin materials (ICC & EY, 2024).

Thus, product innovation indirectly encourages material production and further extraction of earth's resources, emitting considerable amounts of greenhouse gases. Also, pesticides kill parasites but also contaminate the water supply; new surveillance technologies may increase workplace productivity but make workers more stressed and dissatisfied; smart missiles may be helpful for countries that They are deployed to be good and terrible for the countries on the receiving end (Mulgan, 2016). These consequences hurt the environment and human health and significantly reduce innovation's contribution to society's welfare. On the contrary, if we can manage innovation (IM) based on an ethical commitment to create sustainable models of consumption and production, we can recover, treat and return materials to our ecosystem, we

[1] Postdoc researcher, Department of Business Administration and Engineering, Iran university of Science and Technology, Tehran, Iran, https://orcid. Org/ 0000-0001-7744-7749

[2] Associate professor, Department of Business Administration and Engineering, Iran university of Science and Technology, Tehran, Iran, Email: sobhanifard@iust.ac.ir, (Corresponding Author), postal code: 1684613114, https://orcid.org/0000-0003-3298-0464

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

can reduce these adverse effects, and at the same time create economic efficiency. For these reasons, we must prepare our future innovations to participate in the circular economy. However, designing innovations for the circular economy requires deep interdisciplinary knowledge and expertise that most businesses lack (Hans and K.S., 2024 et al. Madanaguli, 2024).

Hence, a balanced management approach to integrate technological innovation with environmental and ethical considerations is necessary to maximize the contribution of innovation in the circular economy. In addition, to transform the linear economy into a sustainable circular economy, an innovative circular economy model is needed (Ranta and A. Saari, 2019; Kopnina and Kim, 2021; Skare et al., 2024), which necessitates a comprehensive study of the dynamic interaction between innovation management (IM) and Circular Economy (CE). Also, politicians, researchers and industries, as the pioneers of this transformational journey, must understand the complexity of technological disruptions in forming sustainable models. To plan the strategies and policies leading this transformation with more excellent vision (ICC & EY, 2024). Based on this, the multiple impact of innovation management and its interaction with the circular economy requires a dedicated bibliographic study, which can act as a compass by guiding innovation's challenges and transformative opportunities for sustainable social and economic progress.

Statistics show an increase in these disorders (Neligan et al. 2022; Truant et al. 2024). For example, the European Commission has promised to support "responsible innovation" as "an approach that anticipates and evaluates potential consequences and societal expectations to foster research designs and inclusive and sustainable innovation" (Mulgan, 2016). Therefore, this paper claims that a deep exploration of the bibliographic of CE and TM is a theoretical and imperative pursuit. This bibliographic study, designed to address crises and opportunities, guides us through the uncharted territories of the evolution of circular economy innovation.

This study aims to use Biblioshiny for in-depth bibliometric analysis at the Intersection of "innovation management" and "circular economy." As no extensive bibliometric study has been conducted in this area, this research is pioneering in its aim to review the existing literature and comprehensively reveal critical insights.

The main objective of this study is to examine in detail the evolving trends of innovation management and circular economy over time. Using Biblioshiny, we seek to identify and quantify publication trends at the Intersection of these two fields and provide a quantitative assessment of the growth and trajectory of scholarly output. In addition, this study aims to apply Biblioshiny to discover thematic developments in the literature. By analyzing both citation networks and keywords, we strive to identify key themes and issues that have emerged over time, providing a quantitative perspective on the evolution of research in the circular economy and innovation management. Furthermore, this study intends to use Biblioshiny to identify prolific scholars and their contributions to the field. Through authorship analysis and citation metrics, we seek to quantitatively identify influential authors and provide insights into the scholarly networks shaping circular economy and innovation management research.

The main research question that this study seeks to answer using the capabilities of the Biblioshiny is: In what ways has researched at the Intersection of circular economy and innovation management evolved, considering its scientific output, breakthrough themes, scholars' impact, and future thematic pathways? Through a comprehensive bibliometric analysis, this research aims to contribute quantitative insights into the interaction of circular growth and innovation management to enhance the evolving landscape of sustainable business models. The results of this Biblioshiny-based analysis provide valuable insights for researchers investigating the Intersection of the circular economy and innovation management. These findings can guide researchers, especially those in their early research stages, by providing a quantitative overview of evolving trends, thematic developments, and influential contributors to the field. This study serves as a brief roadmap for researchers to define their perspective and contribute to the ongoing circular economy and innovation management discourse.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

Literature Review

Circular Economy

The circular economy has been discussed in economics since the 1970s and 1980s. However, a conceptual directive was issued in 2002 that included sustainable conditions. This economic model promotes production, consumption and Recycling. Reducing waste and reusing products, components, and resources are some of its principles (K.S, 2024) (Hans, The Circular Economy emerged as an alternative model to the linear system. Companies must be aware of and use more sustainable practices to transition to a circular economy. For such a transition, companies need to rethink their business models and how they offer value to their customers while considering environmental and social aspects (Suchek et al., 2021). CE is a promising concept for a world that seeks solutions to environmental, social and economic problems (Tieu Nguyen, 2024) (Timilsina et al., 2014). It is described as a 9R framework: reject, rethinks, reduce, reuse, repair, renovation, reuse, recycle and recover (Hunger et al., 2024). Recognizing the fundamental role of the environment, its functions, and its interactions with the economic system, the circular Economy (CE) has emerged as an alternative to the neoclassical economic model (Ghisellini et al., 2016). CE has a regenerative system that minimizes resource inputs and losses, emissions, and energy consumption by slowing, closing, and smoothing material and energy circuits (Geissdoerfer et al., 2017).

CE reduces the amount of materials consumed and the amount of waste produced (Provin and de Aguiar, 2021; Rashid and Shahzad, 2021). CE can also be a strategic choice to enhance human development (Androniceanu et al., 2021). It is one of the promising regulatory policies regarding sustainable development (Danish and Senjyu, 2023). In addition, CE is a model for socioeconomic sustainability (Mukherjee et al., 2023). The global economy is developed through international circular trade while increasing industrial environmental impacts, such as climate change and plastic pollution, are reduced (Krausmann et al., 2018). Therefore, a developing circular global economy can improve living standards and reduce inequalities by increasing employment (Schroder et al., 2020; Skare et al., 2024). This increases economic wealth(de Lange, 2024).

In addition, CE is necessary to achieve sustainability. CE guides businesses and organizations toward more sustainable practices in some areas, including research and development, logistics and reverse logistics, quality control, environmental management, cost management, service management, and strategic planning (Barros et al., 2021). It creates a resource-based, efficient, competitive economy (MITECO, 2020). This strategy makes the foundations of a new pattern of production and consumption in which the value of products, materials and resources is protected for a long time in the economy, and the production of waste is minimized (Sampedro-Beneyto et al., 2024), as well as process and output to maximize ecosystem performance and human well-being. Play an important role. Early definitions of the circular economy excluded the social justice component because it failed to integrate the human condition, which has emerged in recent literature (Murray et al., 2017; Parmar et al., 2010). A standard definition of sustainability is the "triple line," which stands for balancing society, environment and Economy (Elkington and Fennell, 1998; Kristensen and Mosgaard, 2020). A circular economy (CE) can lead our society toward sustainable development and is a suitable policy perspective to encourage companies towards responsible business. As a result, the circular economy model tries to achieve a state of balance between economic growth and sustainable environmental and economic development (EMAF, 2015). At the same time, barriers to technological and financial innovation may hinder the CE transfer process. In this context, environmental innovations (EIs) are significant to overcome these obstacles (de Jesus and Mendonça, 2018)

Technological innovations fundamentally changed how goods and services were produced and consumed in the last century (Prieto-Sandoval et al., 2018). This rapid growth was based on companies adopting linear business models based on a "take, build, dispose" flow of resources known as a "cradle to grave" approach (Bocken et al., 2014; Acosta et al. ., 2020). This approach did not consider the negative environmental and social impacts that an unsustainable supply chain may cause (Antikainen and Valkokari, 2016; Murray et al., 2017). Currently, innovation managers are trying to draw strategies to overcome these challenges, according to which circular Economy (CE) can potentially help to achieve sustainable development and solve these

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

problems (Geissdoerfer et al., 2017; Prieto-Sandoval et al., 2018; Losa, 2025). For example, green investment companies are not only focused on environmental and social goals but also on achieving better financial returns (Carroll and Bellotti, 2015; Ronaghi, 2023a). In line with attention to the environment, circular Economy (CE) is considered a sustainable production and consumption model based on green innovation, which focuses on sharing, renting and reusing, renovating and recycling products. Therefore, it increases the life cycle of products (Ronaghi and Fallahi, 2024b). As previous studies show, sustainable development and effective conversion to CE require new innovative methods in production and consumption models (Androniceanu et al., 2021; Ahmed et al., 2022). And the innovation-oriented circular economy is growing (de Lange, 2024). The United Nations 2030 Agenda 17 has defined the Sustainable Development Goal (SDG), which is between the three dimensions of sustainable development (economic, social and environmental) and shows how social and economic growth depends on the sustainable management of our planet's natural resources. (Khajuria et al., 2022) In addition, CE is intrinsically dependent on ecological innovations in how societies regulate, produce and consume (Prieto-Sandoval et al., 2018). A balanced approach to innovative technology integration with environmental and ethical considerations is necessary to maximize the contribution of artificial intelligence in the Circular Economy (Hans and K.S, 2024).

As a result, the CE circular economy is a dynamic and evolving field critical to forming and developing sustainable business models. This economic model can use new technological innovations, for example, the Internet of Things, blockchain, artificial intelligence and big data analysis in the direction of sustainable development and increase economic, environmental and social sustainability with continuous growth. For this reason, constructive interaction with innovation management is necessary for its evolution and development.

Innovation Management

First, Innovation management emerged as a discipline in the 1890s with Edison's Innovation Factory. Edison changed the image of innovation from a single inventor to a process with well-known steps carried out by a team of inventors. These steps are simplified mainly in all industries and include ideation, concept development, feasibility studies, product development, market testing, and launch. Therefore, innovation management corresponds to developing new products, processes and services. Innovation is to improve how things are done to fulfill the organization's mission (Şimşit et al., 2014). Joseph Schumpeter suggested in 1928 that entrepreneurs can create new opportunities for profit through innovative ways (Schumpeter, 1928; Maziriri et al., 2022). However, the traditional rigid supply chain structures cannot adapt to market changes quickly; instead, the agile supply chains of specialized companies are emerging and adopting new and innovative business models. The rising complexity of technology and the speed of development require a high level of expertise. This requires cooperation in research and development between relevant actors to fill the significant gap in knowledge and innovation capacity and optimal allocation of resources for risk, especially in small and medium enterprises. (Romero and Molina 2011). Companies stay competitive with innovation and create high value compared to traditional product or service development (Freel et al., 2014; Chiambaretto et al., 2020). Therefore, successful innovation management is essential for companies' sustainability (Orellano and Gourc, 2024). Innovation is both a necessary means and a desirable goal for businesses in a moving global economy. Innovation management is also a process that either provides new products and services to customers more efficiently, effectively and faster than competitors or is about increasing the transformation of existing products and services by improving the process (Likar et al., 2013).

Furthermore, innovation and understanding innovation processes are fundamental to social, scientific, and economic change. Innovation is the foundation of productivity and success of companies, societies and nations. Innovation, as a concept, is increasingly viewed as a non-linear multi-dimensional phenomenon involving a complex relational ecosystem with concurrent processes of value creation through collaboration. Innovation can be understood in several broad dimensions: product or process. Technological or non-technological; radical or additive (Green, 2015). Innovation management also includes managing an organization's innovation process, which starts from the initial stage of ideation to the final stage of its successful implementation. It comprises the decisions, activities, and methods to invent and implement the innovation strategy. (Green, 2015, Mingaleva et al., 2022). According to Gartner,

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

innovation management is a business discipline that aims to drive an organization's sustainable innovation process or culture. A disruptive approach to business change accompanies most initiatives in innovation management. So that current employers demand managers who know professional and interpersonal skills and interpersonal attitudes to solve complex problems related to innovation and sustainability, adapt to more complicated challenges and lead sustainable and environmental innovation projects by strengthening Supplier collaboration and embracing circular supply structures to navigate the evolving landscape (Beske-Janssen et al., 2023; Knight et al. al., 2022; Ngoc Huynh et al., 2024). Also, innovation management in organizations involves constant pressure to balance stable and efficient routines of daily operations and dynamic and creative routines that promote innovation. Organizations must be ambidextrous to simultaneously engage in exploitation—focusing on control, efficiency, productivity, and exploration—by embracing creativity, exploration, and discovery. (O'Reilly and Tushman, 2008; Chychun et al., 2023). Innovation management is a tool that supports understanding an organization's operational environment and enables the organization to make and manage innovations more systematically throughout the system's life cycle (Hurni and Grösser, 2017). Accordingly, innovation management in the modern business age is a comprehensive approach that integrates leadership, organizational culture and change management. It's critical for creating an environment where innovation thrives, change is managed effectively, and sustainability is a key focus. This approach is necessary for organizations that aim to save competitiveness and achieve long-term success in a complex and dynamic business world (Henry Orieno et al., 2024). Through innovation management, with clear leadership and strategic implementation, governments can increase green innovation activities in various fields, promote innovative national culture, and reduce obstacles to collective sustainable development by dealing with corruption (Wan Mohammad and Roseli, 2024).

At the organizational level, innovation management is crucial for developing and strengthening sustainable innovation as a driver of long-term survival and a sustainable competitive advantage. Innovation can be managed and facilitated through organizational structure, strategy, processes, leadership, organizational culture, and the relationship of these elements with organizational performance. Therefore, innovation management in the modern era is characterized by the synergy of leadership, culture and change management. (Green, 2015; Mingaleva et al., 2022). Along with the increasing importance of innovation management in creating sustainable models, as shown in a recent survey (KPMG, 2015), technological development has created a growing concern about the human impact on the environment and the limits of global ecological capacity. This has led to political decisions and international agreements to reduce the environmental footprint. Study into key enabling technologies, such as new materials and manufacturing technologies, helps reduce ecological footprints and comply with strict regulations, such as reducing global warming or using non-renewable resources of the cycle life cycle. Package and trade with circular economy models as a suitable solution to reduce environmental impact. The circular economy as a plan was included in the vision of the European Commission, which includes revised legislative proposals to encourage Europe towards a circular economy (European Commission, 2015; Falcke et al., 2024). Therefore, adopting Industry 4.0 technology facilitates the integration of green service innovation strategies in green supply chain management (GSSCM). In addition, the synergistic effects of corporate governance structure and Industry 4.0 technologies strengthen the link between green service innovation paths and GSSCM practices toward green service-based business model (GS-OBM) and environmental, social and governance (ESG) performance (Alkaraan). et al., 2025). Alternative corporate business models towards environmental, social and governance (ESG) conventional supply chain management practices Green Sustainable Supply Chain Management (GSSCM) revolutionized. GSSCM practices focus on formulating and implementing environmentally sustainable strategies (Jabbour and de Sousa, 2016). Business innovation strategies accelerate the modernization of the economic system (Del Giudice et al., 2023). Changing to a new business model or CE is a fundamental way to encourage innovation for sustainable development (Evans et al., 2017). which requires the knowledge and experience of managers in creating innovation strategies and choosing innovation management approaches appropriate to environmental changes (Timilsina and Tieu Nguyen, 2024).

As a result, innovation adds to the product's lifespan. Hence, it ensures the profitability of businesses for a long time and causes their survival and growth. However, if this innovation is used in linear models, not

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

only will this profitability and growth not remain sustainable, but it will also overshadow the sustainability of the environment, economy, and society. Therefore, the growth and development of CE are necessary through innovation management (IM) with a sustainable orientation.

Methods

In this research, bibliometric mapping analysis has been used. As a specialized part of bibliometric science, Bibliometric Mapping studies and analyzes a specific field's structure, trends and scientific patterns. This concept allows researchers to examine the relationships between articles, authors, topics, and scientific institutions and identify interesting and innovative scientific paths. Kraus et al. 2024)). Bibliometric mapping has a variety of applications in different scientific fields, such as identifying scientific trends, examining the impact of articles and authors, formulating scientific policies, examining the status and trends of research in superfields, and improving access to information. (Öztürk 2021, Agbo et al., 2021; Song et al., 2019) This section provides an overview of the method used in this study to perform bibliometric cartographic analysis, including steps such as data collection, screening, extraction and synthesis.

About The web app Biblioshiny

Bibliometric analysis can be done with many software or programs such as Bibliometrix R Package, VOSviewer, and CiteSpace. Biblioshiny is an open-source online visualization software based on Rstudio that allows users to perform bibliometric analyses visually and highly interactively. It has many advantages in statistics, literature analysis, index calculations, network analysis, and knowledge mapping. This software supports introducing data from the Web of Science (WoS) and Scoupus databases (Wei and Jiang, 2023. Bibliometric mapping has been highly regarded as a key tool in analyzing and reviewing scientific data. This science plays a vital role in advancing science and technology by providing solutions for identifying scientific trends, investigating research impacts and helping formulate scientific policies. (Lesnikowski et al., 2019) Considering the upcoming challenges and opportunities, bibliometric mapping has a high potential for growth and development in the coming years. (Bazam et al., 2016) This method is one of the growing methods in scientific circles)Aria & Cuccurullo, 2017). Also cited is Biblioshiny, one of the practical tools in analyzing bibliometric mapping, which allows researchers to do a deeper analysis of scientific data. And gain new insights from scientific trends and relationships. Due to the continuous developments in information technology and analytical tools, these tools can help improve the quality of research and scientific progress (Aria & Cuccurullo, 2017). Therefore, this paper deals with the analysis of bibliometric mapping and elucidates the entire procedural spectrum from data collection and screening to extraction and synthesis, which emphasizes the importance and effectiveness of the Biblioshiny web app in advancing research in this field.

Comprehensive Literature Review and Data Collection

First, we performed a document search in the Scopus database. The search string is made by combining compound keywords using the OR operator. The first search field contains keywords such as "circular economy," OR "green production model," OR "sustainable production and consumption model" To check the article, title, and abstract, were keywords. Simultaneously, the second part of the search integrated keywords such as "technological innovation" OR "innovation management" OR "emerging technology" OR "transformative technology" OR "transformative management" OR "disruptive innovation." The initial query, performed without any filtering, returned 4,727 document results. Search and data retrieval was done on September 25, 2024. Subsequently, these results were filtered to remove irrelevant items based on our predefined inclusion and exclusion criteria. Table 1 shows the search criteria.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

Table 1. Search Criteria for Data Set Retrieval

Criteria	Comment
Articles containing Article title, Abstract, Keywords	This study searched with six keywords, combining the following fields ("circular economy" OR " green production model" OR " sustainable production and consumption model") AND ("technological innovation " OR " innovation management" OR "emerging technology" OR "transformative technology" OR " transformative management" OR "disruptive innovation")
Documents written in the English language	This study exclusively considered articles composed in the English language.
Subject area	Areas that highlighted the interaction of circular economy and innovation management in sustainable business models such as: Environmental Science, Social Sciences, Business, Management and Accounting, Engineering, Economics, Econometrics and Finance,
All data of publication	No specific date range was specified, as the objective was to uncover the trend within the field and pinpoint when scholarly discussions commenced.
Articles in journals	The searches is concentrated solely on documents published in journals.

Since the data collected is only from the Scopus database and given the limitations of the Scopus database, it is essential to acknowledge that our dataset may not be comprehensive. While there is a possibility that data from other databases, such as Web of Science, PubMed, ERIC, etc., may not be considered, this risk is minimized if a comprehensive formatting method is in place and allows seamless integration of data from different databases. Unfortunately, the current version of this study's Biblioshiny bibliometric software does not have this capability. However, despite these limitations, Scopus includes many articles with higher citation records (Jacsó, 2009; Martín-Martín et al., 2018; Schotten et al., 2017). Hence, the collected data are sufficient to draw the scientific perspective, identify the focal points of the research, and perform other analyses specified in this study.

Data Extraction, Loading, and Conversion

After filtering, 2853 data were collected based on the search criteria listed in Table 1. Then, these data were outputted for analysis. The Scopus platform facilitated this process by allowing the export of more than 2000 data at a time, which is a significant advantage over the Web of Science (WoS), which imposes a maximum of 500 data exports simultaneously. In addition, Scopus allows researchers to export data in various formats, including BibTeX, CSV, Plain Text, and RIS. Also, the data was exported in CSV format for this study, facilitating the integrated import into the bibliography for bibliometric tools (Aria & Cuccurullo, 2017). In addition, Scopus offers the researcher a fundamental data analysis with the possibility of advanced study. It helps the researcher to check the accuracy of the data collected for his research.

Data Synthesis

Table 2 is a summary of the primary data of the study. The "period" is from 2007-2025, which indicates that since 2007, it has become essential to address this area. "Resources" indicates different types of publications, such as magazines and books, which were 602 sources in this study. "Documents" is the number of individual publications analyzed, which reached 2853. The "Annual Growth Rate" (AGR) is 17.05, which indicates the change in the measure's value over a year. "Average document age" is 1.84, which reveals the period since the documents were published. "Average citations per document" is 33.72. It measures the average number of citations per document in a particular academic journal or discipline. In addition, it provides vital insight into the importance of research articles in a specific discipline. Keywords Plus (ID)", with a total of 10,797 entries, includes additional keywords and phrases generated by the Scopus

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

system, extracted from the references cited in each document. (Tripathi et al., 2018). In contrast, "author keywords (DE)" are specific terms, totaling 7283, that the authors themselves chose to conclude the main topics of their work. Table 2 also shows 9361 unique authors. In the extracted data, 160 single-authored documents highlight individual contributions, with an average of 4.19 co-authors. In these publications, the "international cooperation of authors" shows a mean of 39.05, which indicates the authors' international cooperation level, as evidenced by the range of keywords and the frequency of citations. These data provide a valuable perspective on the extent of research participation in this area and the range and depth of topics covered. See Table 2 for detailed figures and metrics.

Table 2. Data Synthesis Entails Presenting Primary Information and Offering a Summary of the Dataset

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2007:2025
Sources (Journals, Books, etc.)	602
Documents	2853
Annual Growth Rate %	17.05
Document Average Age	1.84
Average citations per doc	33.72
References	225577
DOCUMENT CONTENTS	
Keywords Plus (ID)	10797
Author's Keywords (DE)	7283
AUTHORS	
Authors	9361
Authors of single-authored docs	160
AUTHORS COLLABORATION	
Co-Authors per Doc	4.19
International co-authorships %	39.05

Result and Discussion

This section addresses the results and discussions, aiming to explain (1) research development and evolution patterns at the Intersection of the circular economy (CE) and innovation management (IM), with an emphasis on publication output, distribution, resources, and citation metrics; (2) participation of scientists, their affiliations, and the extent of their shared networks and (3) thematic focus in the circular economy (CE) and innovation management (IM).

Analysis of research output at the Intersection of circular economy (CE) and innovation management (IM) shows a crucial upward trend in the volume of publications in recent years. This increase reflects the increasing recognition and synergy between CE and IM in academic and industrial circles. The diverse distribution of publications in various specialized, interdisciplinary journals and conferences highlights the multifaceted nature of this field. Citation metrics provide insights into influential works that have shaped intellectual and practical assets and indicate the growth and development of research partnerships in CE and IM.

Examining key researchers' contributions, affiliations, and topics provides a clearer picture of the driving forces in CE and IM. Distinguished academics whose influential work is widely cited are often associated with top-ranked universities and research institutes globally. This study also shows the collaboration networks among these researchers linked through partnerships and joint projects. These networks are crucial for fostering innovation and sustainability, as they enable the pooling of diverse expertise and resources, thereby increasing the overall quality and impact of research in CE and IM.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

The thematic analysis highlights essential trends and focal points in circular economy and innovation management (IMCE). Current research shows a strong orientation towards sustainability model innovation, sustainable development, environmental Economy and Circular Economy. Also, this research focuses on digitization and the fourth-generation revolution with advanced technologies such as artificial intelligence and blockchain, and it shows that sustainable business models, which reflect the global push towards environmentally friendly practices and social responsibility, are growing based on innovation and circular bioeconomy models. Also, economic innovation, green innovation, life cycle assessment, business model innovation, entrepreneurship, supply chain management, and dynamic capabilities are the basis of research (IMCE), and the findings of this research show their vital role in the successful guidance and adaptation of industrial developments 4.0 with It highlights sustainable business models.

Growth and Trend of Technology Management and Innovation Management Research

This section shows the annual growth and trend of the scientific output of articles in the field of circular economy and innovation management. Research in the Intersection of circular Economy and innovation management started in 2007 with two articles. The first paper by Wen et al. In August 2007, titled "Recycle of low chemical potential substance," and the second article by Suocheng et al. in December 2007, titled "Problems and Strategies of Industrial Transformation of China's Resource-based Cities." Based on the analysis of the biblioshiny software, the production and growth of intellectual and theoretical works at the Intersection of these two fields has been accompanied by an annual growth rate of 51.38% from 2007 to the beginning of 2025 (see Figure 1). From 2008 to 2014, we faced stagnation in scientific work at the Intersection of these two fields. However, since 2014, growth has been slow. In the middle of 2017, the growth rate of scientific works suddenly increased, reaching 830 cases from 33 cases in 2017 at the end of 2024, revealing a significant gap in the progress of scientific works in the Intersection of these two areas. Also, considering that this data was collected at the end of 2024, the number of articles at the Intersection of these two areas at the starting point of 2025 is 34, which shows this area's importance, necessity and attractiveness for scientific knowledge.

Table 3. Articles Production Per Year

Year	Articles	Year2	Articles3
2007	2	2017	33
2008	1	2018	67
2009	0	2019	127
2010	3	2020	214
2011	0	2021	392
2012	0	2022	522
2013	0	2023	600
2014	6	2024	830
2015	6	2025	34
2016	16		

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

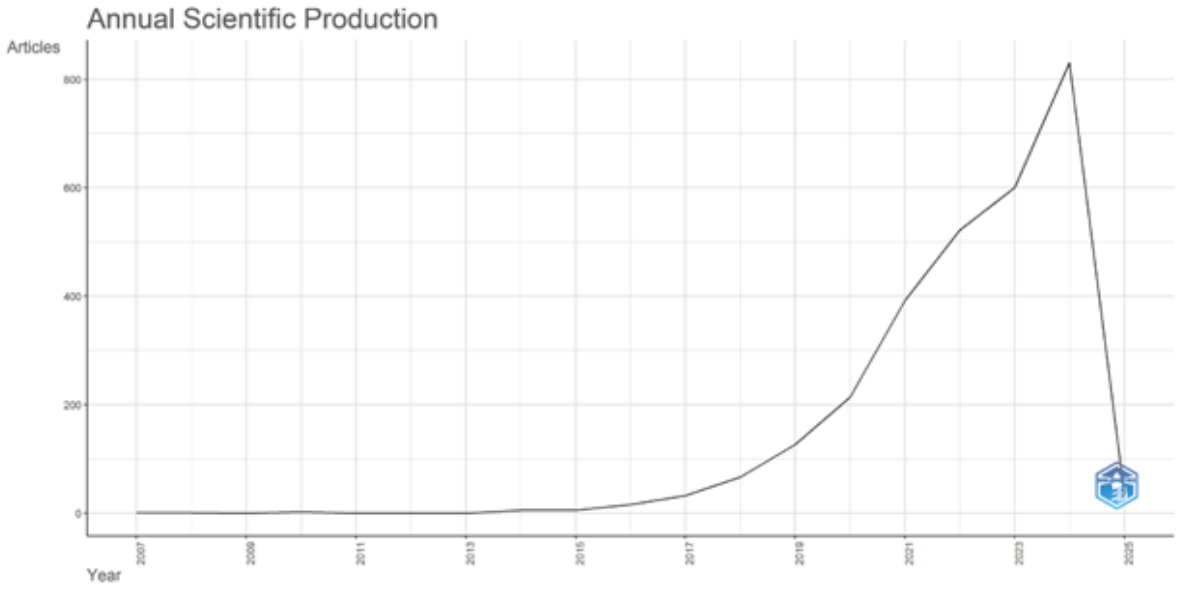

Figure1. Annual Scientific Growth of Articles in the Fields of Circular Economy and Innovation Management by Biblioshiny

In addition, Table 4 shows the average annual professor and the average citation of each work for the number of publications in the field of circular economy and innovation management. The results show that only two publications received an average of 1.94 citations in 2007, a low number that probably marks the beginning of this debate. Of course, after 2007, the trend of the average annual citation and the average citation per work grew, so at the peak in 2015, TC per YEAR and TC per Art reached the peak of 28.83 and 288.33, which shows the highest record. But surprisingly, the average annual citations dropped sharply from 2015 to 2024. So, it reached 2.94 in 2024, the lowest average citation since 2007. The reason for this decrease in citations was not apparent to the authors.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

Table 4. Average Citation Per Year and Average Citation Per Art

Year	MeanTCperArt	N	MeanTCperYear	CitableYears
2007	35.00	2	1.94	18
2008	71.00	1	4.18	17
2010	141.33	3	9.42	15
2014	238.67	6	21.70	11
2015	288.33	6	28.83	10
2016	183.50	16	20.39	9
2017	156.12	33	19.52	8
2018	94.43	67	13.49	7
2019	105.03	127	17.50	6
2020	75.40	214	15.08	5
2021	51.79	392	12.95	4
2022	31.74	522	10.58	3
2023	15.45	600	7.72	2
2024	2.94	830	2.94	1
2025	0.18	34		0

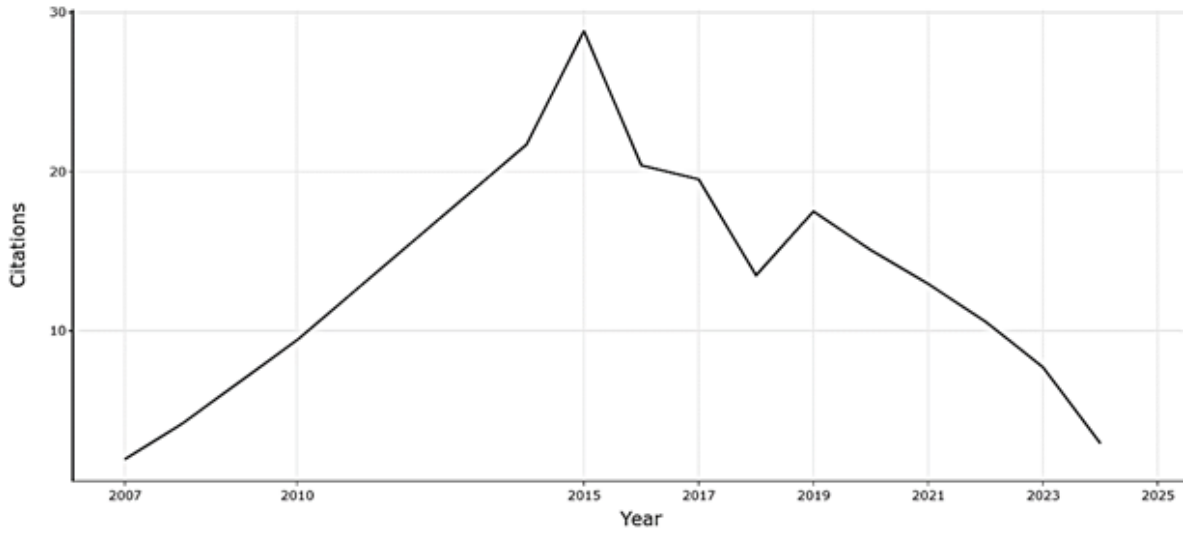

Figure 2. Average Citation Per Year

Resources and Related Documents of Technology Management and Innovation Management Publications

Figure 3 shows the results of the top 20 relevant sources that emphasize publishing articles on circular economy and innovation management. This data is derived from Scopus and retrieved in September 2024. In particular, "JOURNAL OF CLEANER PRODUCTION" and "SUSTAINABILITY (SWITZERLAND)" are the most essential sources that contributed to the publication of 307 articles since 2007. Additional influential sources include: "BUSINESS STRATEGY AND THE ENVIRONMENT," "FOODS," and "RESOURCES, CONSERVATION AND RECYCLING."

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

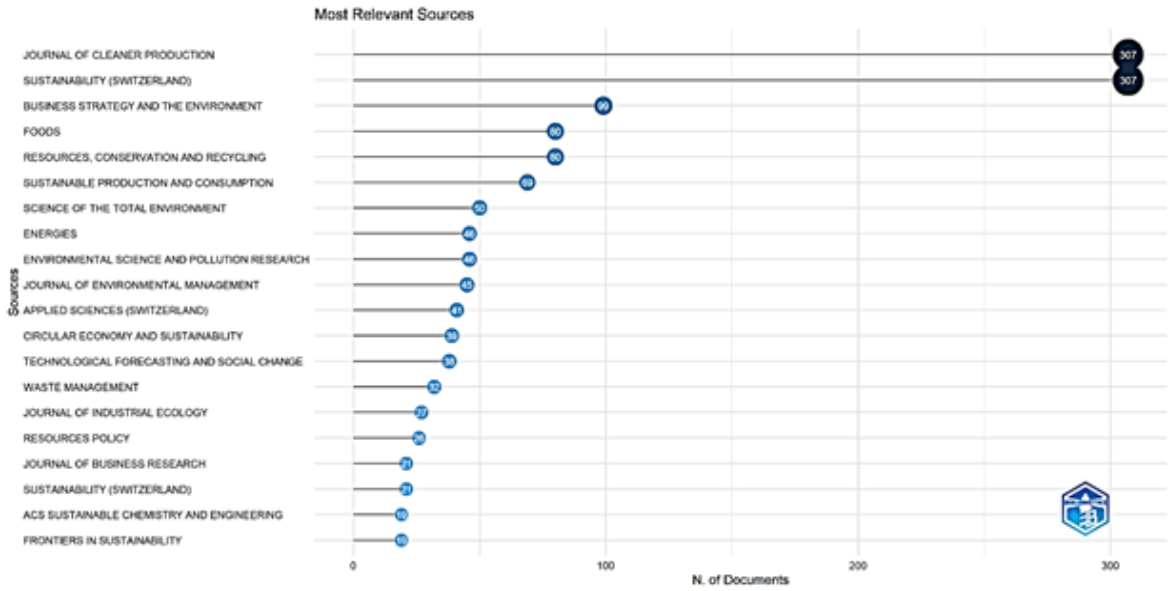

Figure 3. Distribution of Articles by Relevant Sources From 2007 To Mid-2024.

According to the relevant documents available in the field of circular economy and innovation management, this study analyzed global and local citations of publications. Global citation count is the total number of citations by a document from all publications indexed in a resource (WOs, PubMed, etc). This criterion also assesses the broad impact of a document, i.e., it takes citations from different disciplines. On the contrary, local citation evaluates the number of citations a document has received from other documents in the analyzed data set. It assesses its impact within the scope of the studied collections (Aria & Cuccurullo, 2017). Global citations include references that are global in scope and cover a variety of fields, while local citations focus only on references in the specific discipline under review (Alkhammash, 2023; Waheed et al., 2018). For this purpose, the analysis shows that the most global citation between 2007 and mid-2015 is the article "Product services for a resource-efficient and circular economy – a review" (Tukker, 2015). It has been published with a total of 1351 citations. It is noteworthy that this article has received the most local citations, with a total of 141 local citations. However, the ratio of local references to global references is lower than in most years of the study period. In addition, the findings show 20 referenced documents from the dataset under review (see Figure 4). Table 5 also shows information about the 20 papers with the most global citations, and Table 6 shows the documents with the most local citations. provides

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

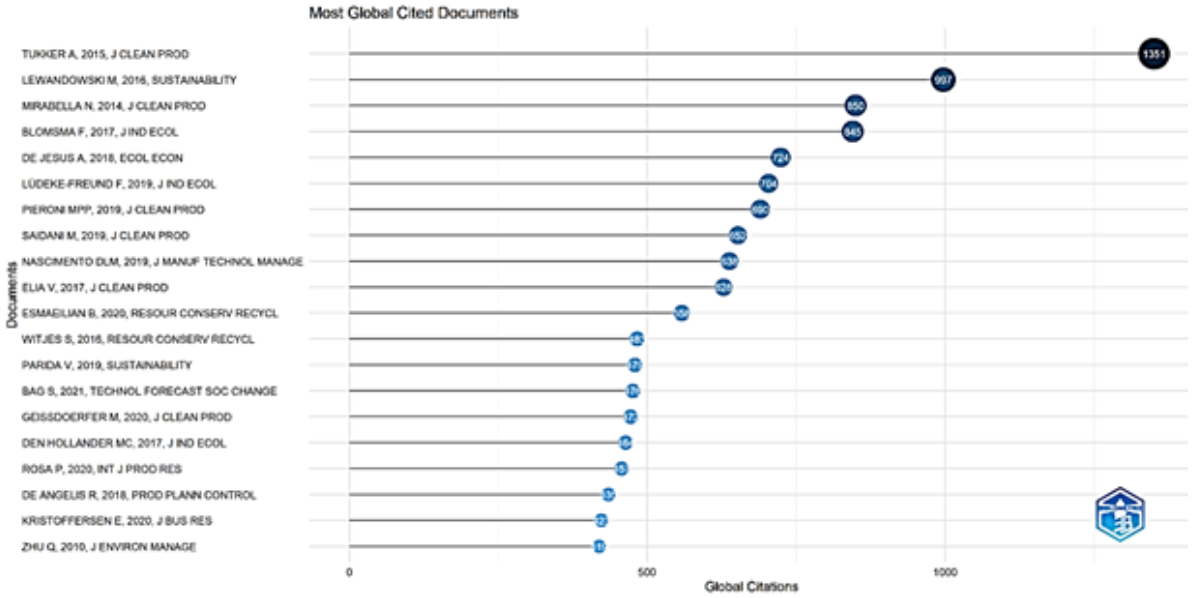

Figure 4. Top Twenty References by Number of Global Citations from the Collection Dataset

Table 5. Top Twenty-Five References by Number of Global Citations from the Collection Dataset

Paper	DOI	Total Citations	TC per Year	Normalized TC
TUKKER A, 2015, J CLEAN PROD	10.1016/j.jclepro.2013.11.049	1351	135.10	4.69
LEWANDOWSKI M, 2016, SUSTAINABILITY	10.3390/su8010043	997	110.78	5.43
MIRABELLA N, 2014, J CLEAN PROD	10.1016/j.jclepro.2013.10.051	850	77.27	3.56
BLOMSMA F, 2017, J IND ECOL	10.1111/jiec.12603	845	105.63	5.41
DE JESUS A, 2018, ECOL ECON	10.1016/j.ecolecon.2017.08.001	724	103.43	7.67
LÜDEKE-FREUND F, 2019, J IND ECOL	10.1111/jiec.12763	704	117.33	6.70
PIERONI MPP, 2019, J CLEAN PROD	10.1016/j.jclepro.2019.01.036	690	115.00	6.57
SAIDANI M, 2019, J CLEAN PROD	10.1016/j.jclepro.2018.10.014	652	108.67	6.21
NASCIMENTO DLM, 2019, J MANUF TECHNOL MANAGE	10.1108/JMTM-03-2018-0071	638	106.33	6.07
ELIA V, 2017, J CLEAN PROD	10.1016/j.jclepro.2016.10.196	628	78.50	4.02
ESMAEILIAN B, 2020, RESOUR CONSERV RECYCL	10.1016/j.resconrec.2020.105064	558	111.60	7.40
WITJES S, 2016, RESOUR CONSERV RECYCL	10.1016/j.resconrec.2016.04.015	483	53.67	2.63
PARIDA V, 2019, SUSTAINABILITY	10.3390/su11020391	479	79.83	4.56
BAG S, 2021, TECHNOL FORECAST SOC CHANGE	10.1016/j.techfore.2020.120420	476	119.00	9.19
GEISSDOERFER M, 2020, J CLEAN PROD	10.1016/j.jclepro.2020.123741	472	94.40	6.26
DEN HOLLANDER MC, 2017, J IND ECOL	10.1111/jiec.12610	464	58.00	2.97
ROSA P, 2020, INT J PROD RES	10.1080/00207543.2019.1680896	457	91.40	6.06
DE ANGELIS R, 2018, PROD PLANN CONTROL	10.1080/09537287.2018.1449244	435	62.14	4.61
KRISTOFFERSEN E, 2020, J BUS RES	10.1016/j.jbusres.2020.07.044	423	84.60	5.61
ZHU Q, 2010, J ENVIRON MANAGE	10.1016/j.jenvman.2010.02.013	419	27.93	2.96
UPADHYAY A, 2021, J CLEAN PROD	10.1016/j.jclepro.2021.126130	399	99.75	7.70
JIA F, 2020, J CLEAN PROD	10.1016/j.jclepro.2020.120728	384	76.80	5.09
CENTOBELLI P, 2022, INF MANAGE	10.1016/j.im.2021.103508	373	124.33	11.75
DESPEISSE M, 2017, TECHNOL FORECAST SOC CHANGE	10.1016/j.techfore.2016.09.021	373	46.63	2.39
VELÁZQUEZ-MARTÍNEZ O, 2019, BATTERIES	10.3390/batteries5040068	362	60.33	3.45

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

Table 6. Top Twenty-Five References by Number of Local Citations from the Collection Dataset

Document	DOI	Year	Local Citations	Global Citations	LC/GC Ratio (%)	Normalized Local Citations
TUKKER A, 2015, J CLEAN PROD	10.1016/j.jclepro.2013.11.049	2015	141	1351	10.44	5.42
DE JESUS A, 2018, ECOL ECON	10.1016/j.ecolecon.2017.08.001	2018	133	724	18.37	16.08
BLOMSMA F, 2017, J IND ECOL	10.1111/jiec.12603	2017	126	845	14.91	7.57
ROSA P, 2020, INT J PROD RES	10.1080/00207543.2019.1680896	2020	99	457	21.66	36.65
PIERONI MPP, 2019, J CLEAN PROD	10.1016/j.jclepro.2019.01.036	2019	86	690	12.46	14.70
KRISTOFFERSEN E, 2020, J BUS RES	10.1016/j.jbusres.2020.07.044	2020	82	423	19.39	30.36
ELIA V, 2017, J CLEAN PROD	10.1016/j.jclepro.2016.10.196	2017	70	628	11.15	4.21
FERASSO M, 2020, BUS STRATEGY ENVIRON	10.1002/bse.2554	2020	67	340	19.71	24.81
DE ANGELIS R, 2018, PROD PLANN CONTROL	10.1080/09537287.2018.1449244	2018	64	435	14.71	7.74
SAIDANI M, 2019, J CLEAN PROD	10.1016/j.jclepro.2018.10.014	2019	64	652	9.82	10.94

Scientific Publication Production By Region/Countries

The review of scientific production and participation in the circular Economy and innovation management in the region's countries shows the United Kingdom as the leader in this field, with 10,943 documents with the most content production. Italy ranks second with 9,974 documents. China emerged as the leading country in Asia with 7,993 documents, while the Netherlands and India followed with 6,137 and 5,018 documents, respectively.

With a deeper analysis, the top 20 countries are ranked based on total and average citations. Denmark maintains its leading position, followed by the United Kingdom. Furthermore, as shown in Table 7, France and the Netherlands emerge as important contributors with significant influence in this area.

In addition, Figure 5 shows the authors' extent of GCP and SCP contributions. Based on these two criteria, there are two types of articles: Single Country Publications (SCP), where all authors belong to one country and such publications represent intra-country collaboration, and Multi-Country Publications (MCP), where authors belong to different countries. They are distinct, and such publications represent foreign cooperation (Sweileh et al., 2016). In this research, Italy, with SCP=299, shows the highest participation of internal authors and China, with MCP=119, shows the highest involvement of external authors.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

Table 7. Top Twenty-Five Most Cited Countries in the Field of Circular Economy and Innovation Management

Country	TC	Average Article Citations
UNITED KINGDOM	10934	65.90
ITALY	9974	30.90
CHINA	7993	30.00
NETHERLANDS	6137	55.30
INDIA	5018	30.20
SPAIN	4642	24.60
SWEDEN	4071	48.50
USA	3826	36.80
GERMANY	3755	31.60
FINLAND	3548	50.70
BRAZIL	3407	31.00
FRANCE	2984	58.50
PORTUGAL	2438	32.90
POLAND	2355	33.60
DENMARK	2345	69.00
AUSTRALIA	2153	29.90
AUSTRIA	1080	36.00
NORWAY	977	40.70
BELGIUM	918	34.00
MALAYSIA	734	16.70
QATAR	642	49.40
GREECE	625	17.90
SOUTH AFRICA	611	35.90
TURKEY	586	20.90
CANADA	497	19.10

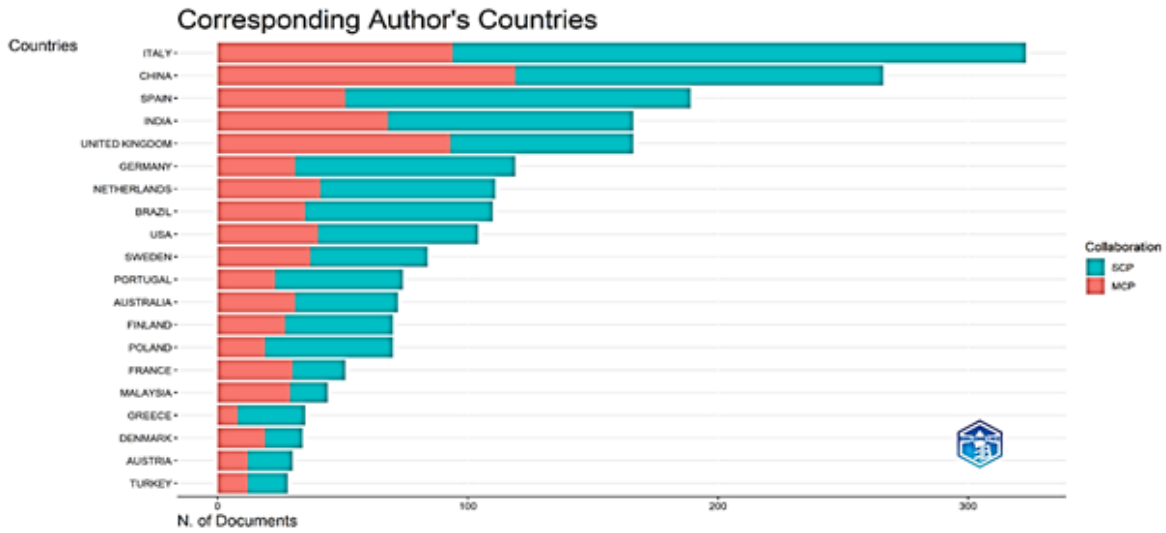

Figure 4. Corresponding Authors Countries' GCP and SCP

Prolific Scholars, Institutions, and Collaboration Network

Prolific Scholars in the Field of Circular Economy and Innovation Management

Figure 6 is a comprehensive visual representation of prolific researchers, their respective countries and specific areas of interest in the circular Economy and innovation management. This three-field plan depicts the article's contributions by countries, authors, and thematic elements of this field. The left column lists the active countries, the middle column highlights the contributing scientists from these countries, and the

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

right column shows the most frequently used keywords used by the authors, called "topics" in this study. Figure 5 emphasizes the visual cues through each box's height and the thickness of the connecting lines. Box height indicates significance; taller boxes represent significant contributions. Similarly, the thickness of the lines represents his solidarity, and thicker lines represent participation in a greater volume of work or information produced.

From the left side of the left column, indicating the countries of origin for the research, we see significant contributions from China, India, Italy, the Netherlands and the United Kingdom. These countries are the main centers of circular economy research and innovation management, which shows a strong scientific and industrial trend in these fields. Other notable countries include the United States, Brazil, Denmark and Türkiye, which shows the global trend towards these areas.

The middle column lists prominent authors in the field. For example, Kumar A, Kumar V, and Liu Y have important research studies that are highly related to the leading issues of circular economy and innovation management, showing their effective contribution. Other authors such as Bocken H, Sehnem S and Sassanelli C are also worthy of attention because they have strong and meaningful links with key topics. This indicates their research is influential and widely published in the scientific and academic community.

The rightmost column shows the Author's essential keywords to understand the research better. Keywords such as "circular economy," "sustainability," "Industry 4.0," and "sustainable development" are highlighted, indicating their centrality in this field. Other vital topics include "Business Model Innovation," "Circular Business Model," "Blockchain," and "Waste Management". These keywords highlight the diverse aspects of the interaction between the circular economy and innovation management that are studied. The connection between these three fields reveals several profound insights. First, there is a strong link between Chinese researchers and the keywords "circular economy," "sustainability," "Industry 4.0", "sustainable development," and "business model innovation." It also shows that Chinese researchers have a significant focus on these issues. Similarly, British Indian and Italian researchers strongly correlate with these keywords, indicating a common trend among these important academic centers. Authors such as Kumar A, Kumar V, and Liu Y show direct links with the keywords "circular economy," "sustainability," "Industry 4.0", "sustainable development," and "business model innovation" and their influential roles in advancing these fields. The existence of multiple connections between authors such as Bocken H, Sehnem S, and Sassanelli C shows that their work covers a wide range of topics related to the circular economy and innovation management.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

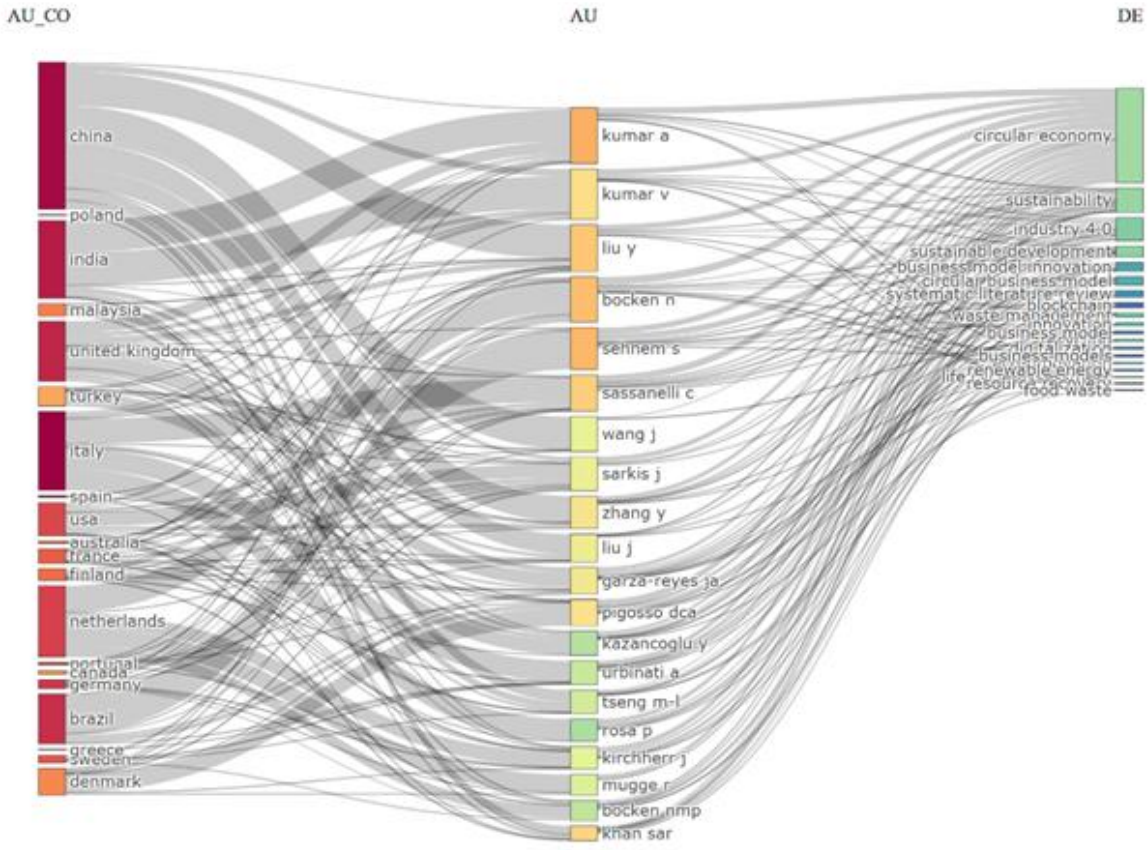

Figure 6. A Three-Field Plot of Countries, Authors, and Themes of Circular Economy and Innovation Management

Institutions, co-authorship, collaboration Network and Countries' Collaboration

In examining co-authorship and social collaboration, this research investigated the social structure aspect of bibliometric Biblioshiny. The social network in a discipline defines the connections between individuals, institutions or countries based on the degree of cooperation (Benomar et al., 2022), where nodes mean actors and their links represent their participation. The size of the circle shows the extent of their cooperation network. In addition, there are smaller networks within the more extensive network. This study presents the Author's collaboration network in Figure 7 and the institution's collaboration network in Figure 8. The result shows that prominent authors such as Kumar A, Sassanelli C, Liu Y, and Bocken N, recognized as prolific academics in this field, have a strong collaboration network.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

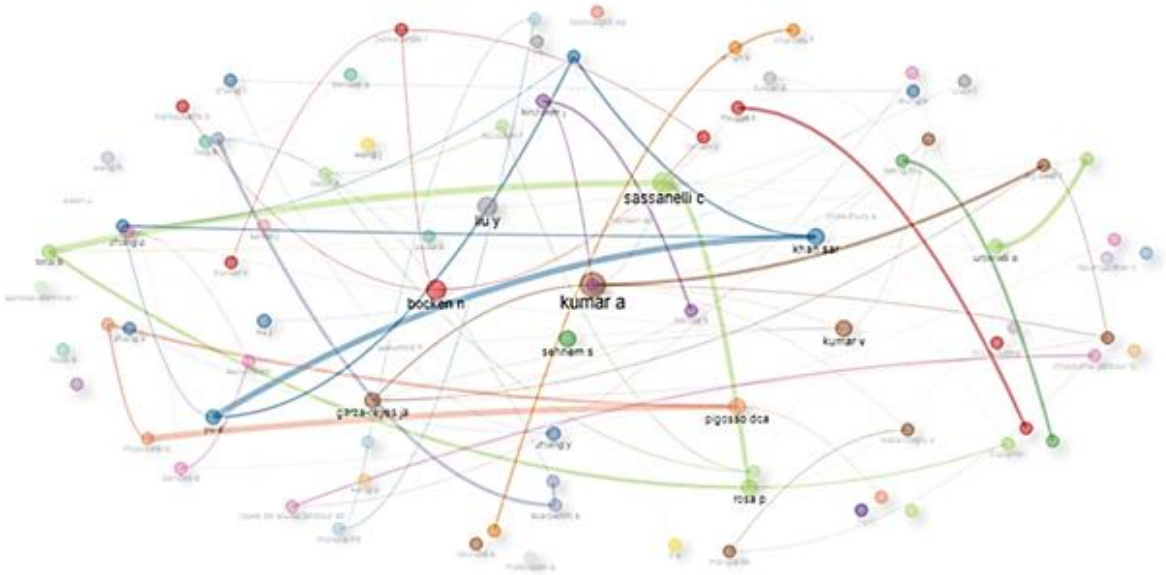

Figure 7. Collaboration Network Between Authors

As shown in Figure 8, Delft University of Technology has established a vast network of cooperation with other universities. At the same time, few other universities exhibit minimal or no collaborative networks. Despite active participation in research of circular economy and innovation management, these institutions have not collaborated with others to expand their social network in this area. For example, Wageningen University and Research, Aston University, University of Modena and Reggio Emilia, University of Minho, etc., are isolated without a cooperation network.

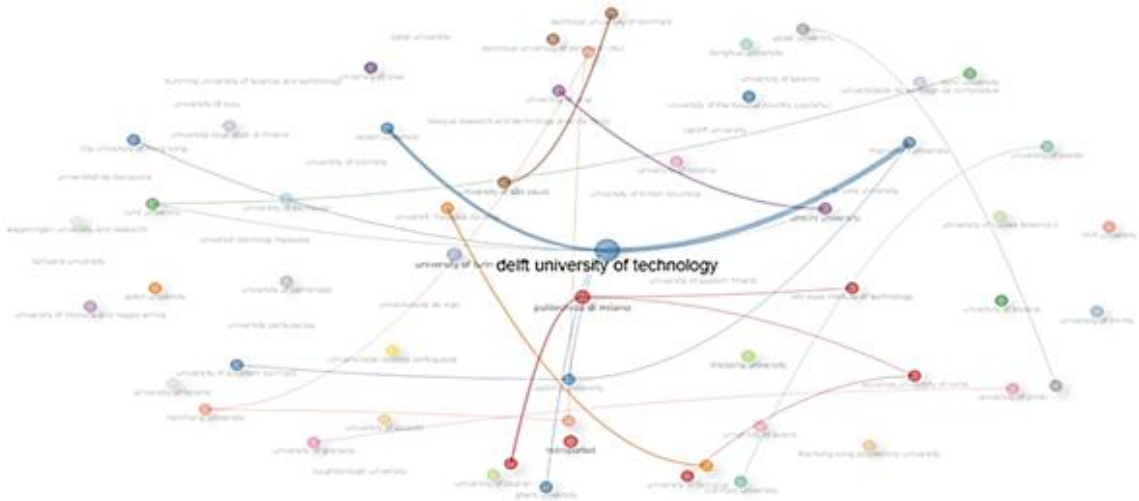

Figure 8. Institution's Collaboration Network

The country cooperation map in Figure 9 and Table 8 shows the frequency of cooperation of the top 10 countries worldwide. According to the table, the frequency of participation from China to Britain, India to Britain, and the United States of America is the highest, with 43, 38, and 34 cases, respectively, which shows that Asia and Europe have contributed the most in this field.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

Figure9. Countries' Collaboration World Map

Table 8. Top Ten Countries' Collaboration Frequency in the World

From	To	Frequency
CHINA	UNITED KINGDOM	43
INDIA	UNITED KINGDOM	38
CHINA	USA	34
ITALY	UNITED KINGDOM	31
UNITED KINGDOM	FRANCE	30
CHINA	MALAYSIA	27
ITALY	SPAIN	26
CHINA	INDIA	25
UNITED KINGDOM	USA	25
SPAIN	PORTUGAL	23

The Thematic Focus of Circular Economy and Innovation Management

This section addresses common themes shaping the circular Economy and innovation research landscape and examines areas researchers have focused on over the years. The study also seeks to identify any changes in the topics discussed in this context. The analysis was performed by carefully examining the authors' keywords and their frequency of occurrence, then by investigating keyword dynamics, trending topics, treemaps, Co-occurrence networks, and topic areas within the domain.

Keyword Analysis and Co-Occurrence Network

In their works, the authors examine keywords crucial for deciphering emerging issues and understanding the tendency of the academic community in a field (Agbo et al., 2021; Benomar et al., 2022). This review is essential because it allows researchers to quickly identify themes and emphases in each publication through the keywords used. In Figure 10, the word cloud is the most frequently used keyword in circular economy and innovation management publications. Figure 11 shows the number of occurrences of these keywords.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

Figure 10. A Clear Word Cloud Visualization of the Most Frequently Used Keywords in the Field of Circular Economy and Innovation Management

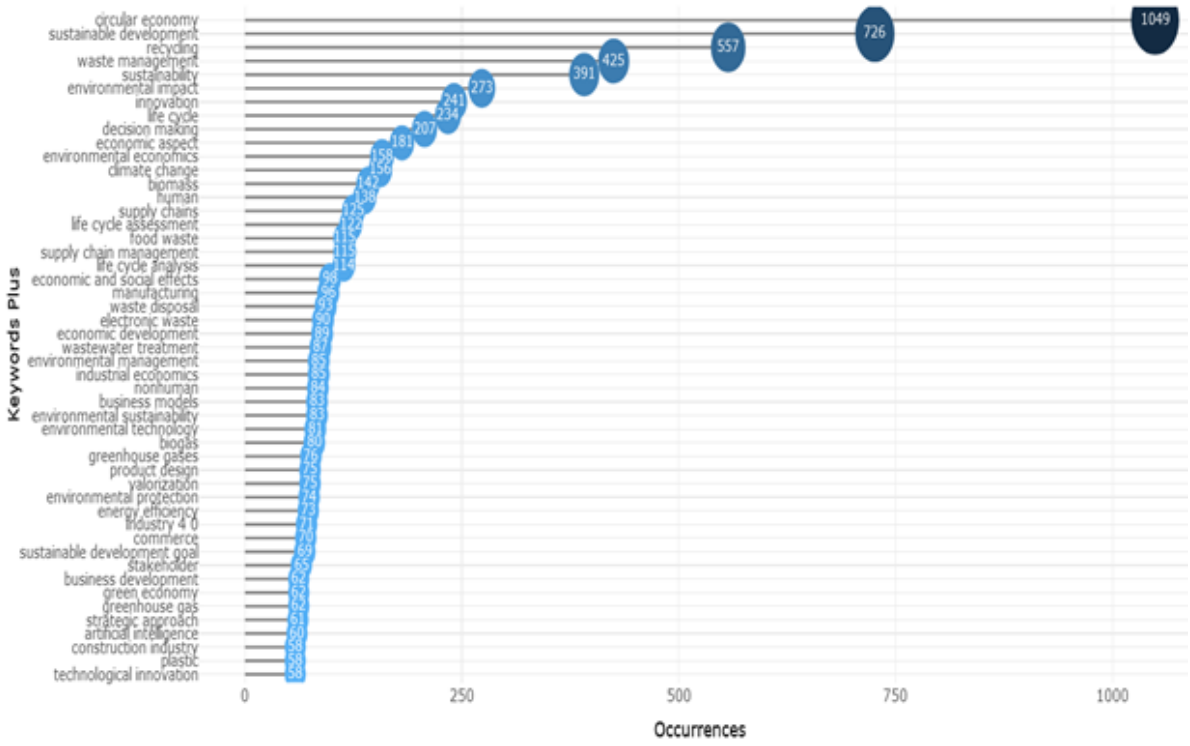

Figure 11. Occurrence of the Keywords Plus in the Field of Circular Economy and Innovation Management

In this regard, Figure 12 shows the dynamic view of authors' most used keywords over time. According to the figure, these keywords started to grow and develop continuously around 2016. In comparison, the most repetition of these keywords was in 2024. But, from 2004 to 2025, this cumulative event reached a constant rate. Circular economy and sustainable development continued to grow dynamically until 2010 with a higher growth rate than other keywords.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

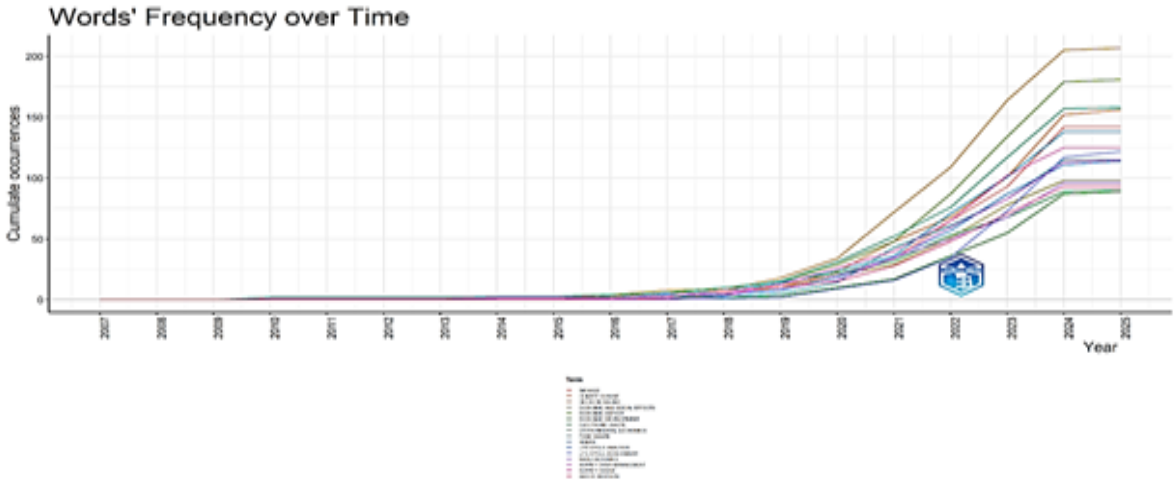

Figure 12. Authors' Keywords' Dynamic View Over Time

The circular economy became one of the most frequently used keywords in 2016. It grew by 2025 with a significant difference from other keywords, which shows that the interaction between the two fields of circular economy and innovation management has been effective and has led to the growth of writers' desire for this issue to be addressed until 2024. However, starting in 2024, the growth rate was fixed for reasons the authors did not mention. Sustainable development has also been promoted as another frequent keyword since 2016. Therefore, sustainable development as an aspect of circular economy and innovation management has been discussed among researchers over the years (see Figure 12).

In addition, this in-depth research explored the Keyword Convergence Network (KCN) to gain further insights into the dynamics of the circular Economy and innovation management. Through KCN analysis, the complex interrelationships between keywords in scientific research were clarified, and a holistic understanding of the knowledge network in this field was provided (Esfahani, 2019). Hence, our findings identify frequent keywords, as shown in the word cloud (Figure 10), and reveal their complex relationships (Figure 13). Significantly, keywords with a larger circle have a more significant impact on the network. The different thickness of the lines indicates the strength of the connection between the keywords. Thicker lines indicate a strong correlation. While thinner lines indicate weaker connections, keywords without connecting lines indicate no relationships between them and other words.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

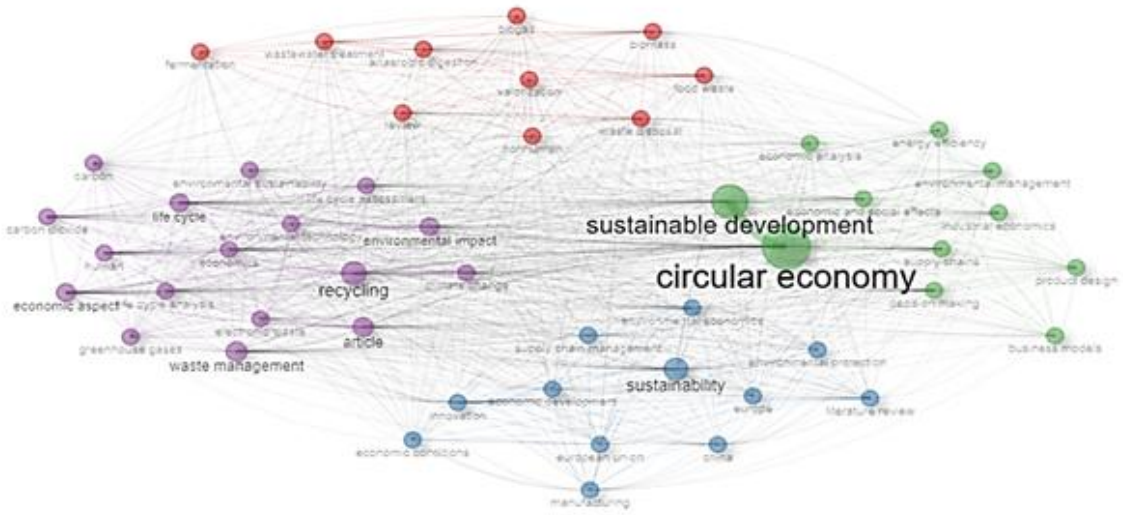

Figure 13. Co-Occurrence Network of Keywords

Also, for a more detailed and clear understanding of the subjects of this research, see the tree map (see Figure 14). A tree map in the field of bibliometric analysis is a visualization tool that provides a hierarchical view of data. Regarding author keywords in Biblioshiny, a tree map visually shows the distribution and frequency of keywords used by different authors (Rajimol et al., 2024). The size of the rectangles shows the frequency of that keyword. In this circular map, sustainable development, Recycling, waste management, sustainability and environmental effects are the most abundant.

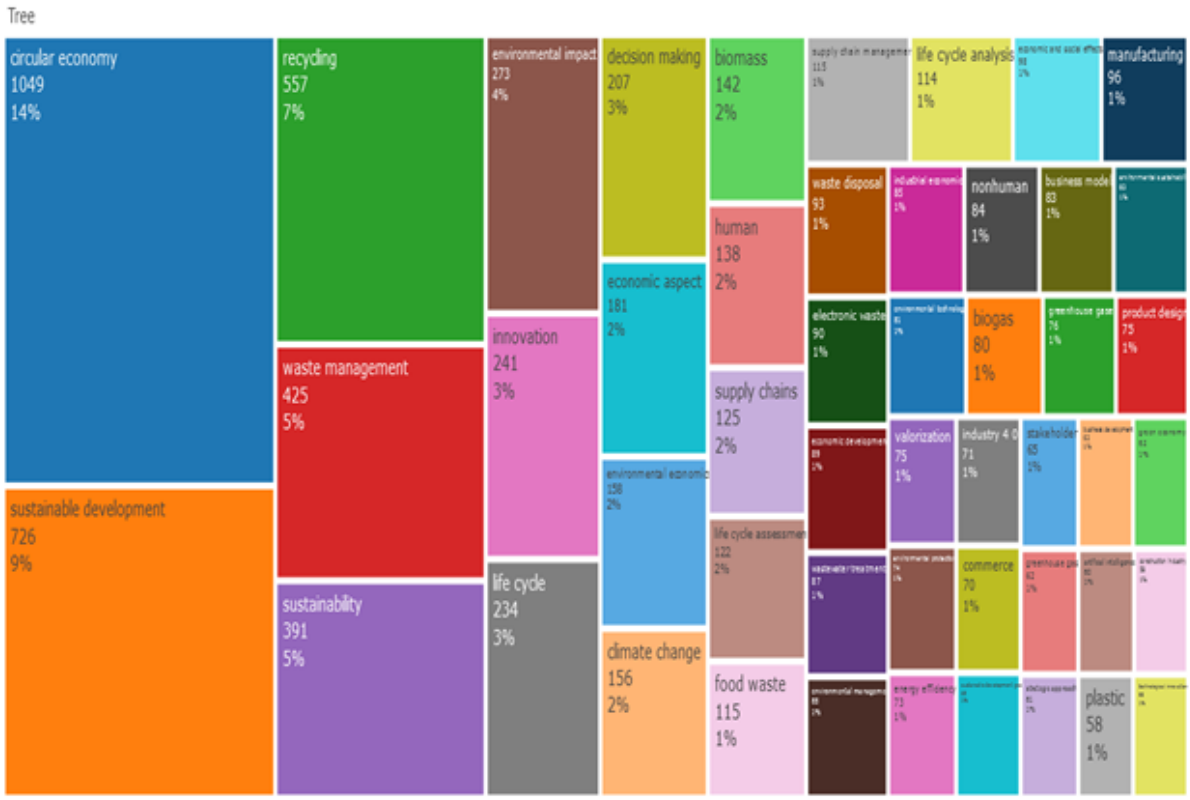

Figure 14. Threemap of Fifty Top Author's Keywords

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

Also, trend topics were extracted and analyzed based on the Author's keywords from the dataset. Authors usually specify article keywords that can serve as guides to extract thematic nuances from the content (Song et al., 2019). This systematic review reveals emerging trends by monitoring the frequency of these keywords across the literature, thereby presenting valuable insights into the evolution of the circular economy and innovation management over time. Although the keywords of many authors are represented in the word cloud (Figure 10), the analysis in Figure 15 reveals a hierarchical arrangement of topics at the Intersection of circular economy and innovation management discussed by researchers in different years. These topics can be related to circular economy and innovation management in many ways. For example, in 2022, Recycling had the most discussion in circular economy and innovation management. Similarly, in 2023, Green Economy was a leading theme, a key concept in circular economy and innovation management.

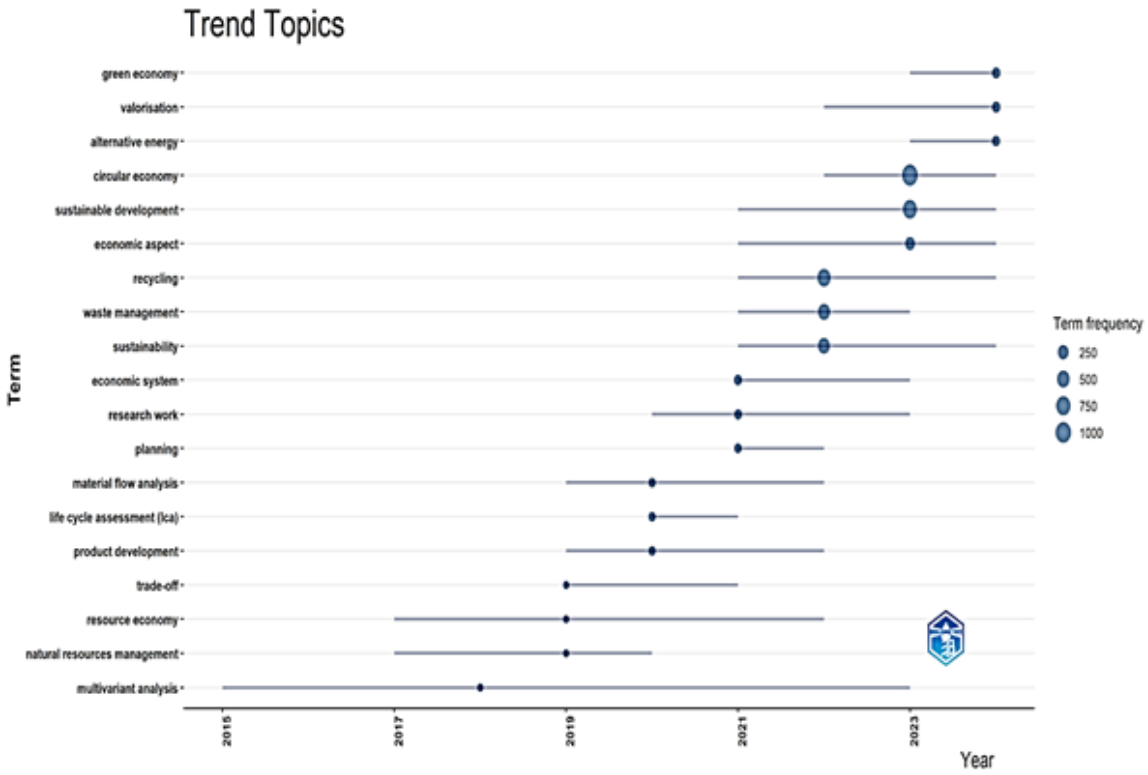

Figure 15. Trending Topics

In this study, another insightful analysis involves the creation of a thematic map of the circular economy and innovation management. The primary purpose of this thematic map is to show the field's current state and provide a glimpse of its future sustainability. Such analysis is valuable in increasing the knowledge of researchers and stakeholders about informed directions for future research and development in specific subject areas. Thematic analysis in this study includes the examination of clusters of authors' keywords and their mutual links to extract thematic areas. These themes are characterized by density (depicted on the vertical axis) and centrality (on the horizontal axis). Centrality evaluates the degree of mutual connections between different topics, while density evaluates the internal coherence within nodes (Esfahani et al., 2019). Two characteristics, density and centrality, determine the development and importance of the topic in the topic network. Nodes with more connections to others have higher centrality and importance, placing them in critical positions in the network. Cohesion between nodes, represented by density, represents the field's ability to grow and maintain itself. Figure 16 presents a thematic map of circular economy and innovation management, divided into four quadrants (Q1 to Q4).

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

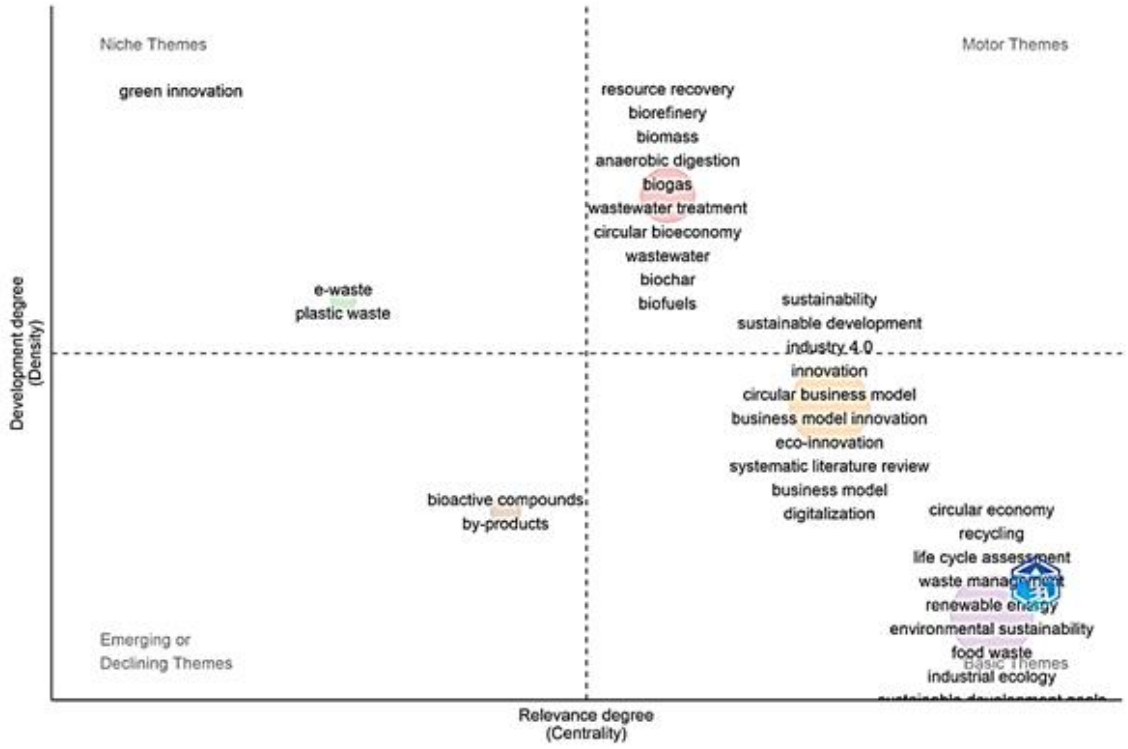

Figure 16. Thematic Map

According to the Author's keywords, the thematic map shows the most relevant issues in the desired field (Figure 15). The purpose of making a thematic map is to understand the current situation and the future direction of research development in this field. It measures the centrality of the network cluster or the degree of interaction with other graph clusters and reveals the importance of the study topic. The Y-axis represents density and measures the internal strength of the cluster network and topic development. By plotting themes graphically, we (a) Motor themes (first quadrant, top right): these cluster network themes have high centrality and density, are also well developed and are critical to the structure of a research topic. (b) Niche topics (second quadrant, top left): topics with high density and low centrality, meaning they have limited relevance. (c) Emerging or declining themes (third quadrant, bottom left): Themes with low centrality and low density mean that they are minimally developed and marginal. (d) Basic themes (fourth quadrant, (bottom right): represents basic themes with high centrality and low density. These themes are critical for transdisciplinary research topics. In the visual representation of movement to the right, Up over time indicates an uptrend, while a path to the lower left indicates a downtrend (Alkhammash, 2023; Bagdi et al., 2023).

The topic map obtained from this bibliometric study provides a nuanced perspective of circular economy and innovation management topics. In the upper right quadrant, under the heading "Motor thematic," we find areas such as "resource recovery," "biorefinery," "circular bioeconomy," and "wastewater treatment." These topics are very relevant and well-developed, which shows that they are the leading drivers in this field. Their importance shows that environmental issues, recovery, renewal and restoration of resources are increasingly central to the circular Economy and innovation management. This emphasis aligns with the global trends towards the economy's composition, Which is aligned with environmental issues. The remarkable development of these topics shows that significant scientific research has been devoted to recognizing and improving adaptation to renewable resources and an environmentally responsible economy. These are also critical themes of interaction between the circular Economy and innovation management, which are well-developed.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

The opposite, upper left quadrant, called "niche topics," includes "green innovation," "e-waste," and "plastic waste." These themes are well-developed, but they are essential in specific areas. Their specialized nature shows that they respond to the field of sustainable production and industry consumption. For example, green innovation includes innovations that help create key products, services, or processes to reduce environmental damage, impact, and degradation, such as lowering electronic and plastic waste while conserving natural resources. However, their specific situation shows that these topics, although advanced, are not widely applicable to all areas of circular economy and innovation. Moving to the lower left quadrant, "emerging or declining topics," topics such as "bioactive compounds" and "by-products" can be seen. These themes are neither well-developed nor particularly central, indicating areas that may be developing or losing relevance. For example, bioactive compounds are non-nutritive compounds of food that have biological activity in the body and have been of interest in maintaining the health of the body, which can represent nascent research areas that have not yet reached maturity. By-products include product production beyond the purpose of the main product and include industrial and biological combined production, which is essential for the circular economy. These themes may not have achieved the importance required to influence this field. The themes of this quadrant are worth noting to determine whether they shape future growth areas or are becoming obsolete.

Finally, by moving to the fourth quadrant, "basic topics" (bottom right), some topics in this category, such as "sustainable development," "industry 4.0", "circular business model," "business model innovation," "eco-innovation" "digitalization," "blockchain." "artificial intelligence" and "dynamic capabilities" are prominent and, while highly important in interdisciplinary studies, have more development than other subjects. Other topics that are of high importance and are more vital in terms of transdisciplinary topics are "life cycle assessment," "waste management," "environmental sustainability," "circular business model," and "Renewable energy." Based on this, it is possible to analyze the fundamental issues of the Intersection of the two areas of circular economy and innovation management, which has grown increasingly. Therefore, it deserves more attention and study.

Conclusion

Using the Biblioshiny web app, this study deals with a comprehensive bibliometric analysis of research progress at the Intersection of circular Economy and innovation management. A bibliometric analysis using Biblioshiny revealed several important insights into research progress at the Intersection of circular economy (CE) and innovation management (IM). These findings show that publications and collaborations in this field are increasing since 2007. In addition, this study shows a significant increase in publications in recent years due to the upward growth of scientific productions, which indicates the increase in scientific orientation and the importance of these fields. The dataset contains 2853 documents from 602 sources, with an average citation rate of 33.72 per document, which indicates an increase in scholarly interest and action in this area. The thematic analysis introduces trends, engine themes and main topics that dominate the current research discourse, such as "resource recovery," "circular bioeconomy," "sustainable development," "circular business model," business model innovation," eco-innovation," and "digitalization,"

The network analysis highlights prolific scientists and influential institutions that significantly impact the development of CE and IM, demonstrating a valuable network of collaborations. This interconnection reveals a solid foundation for future joint scientific actions, promoting collective knowledge and increasing innovation across disciplines, such as the co-occurrence network (Figure 13), that emphasizes the interconnectedness of these issues. In contrast, the collaboration network (Figure 7) shows the authors' extensive collaboration with influential contributors such as Kumar A. and Sassanelli C.

In addition, the topic evolution map emphasizes the dynamic and progressive nature of these fields, with motor themes constantly strengthening and evolving paths, which can reflect the importance of the topic and the interest of researchers to find alternative ways of linear economics by using innovation in the scope of different sciences. In addition, the three-field diagram (Figure 6) depicts the relationships between countries, authors and research topics, indicating strong international collaborations, especially among

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

countries such as China, India and the UK. This study provides a comprehensive overview of historical and current trends at the Intersection of CE and IM and reinforces quantitative insights in the field. These findings illuminate the theoretical landscape and help predict future directions that could shape the evolution of circular economy research and innovation management.

Implications for Research, Practice, and Society

The findings of this research have many positive and practical consequences for different fields, including university, industry and society. This research provides new insights that bridge the gap between theory and practice by analyzing progress and thematic trends in the Intersection of circular Economy and innovation management through a comprehensive bibliometric approach.

Also, the findings of this study fill the gap between theoretical frameworks and applications of circular economy and innovation management. Bibliometric analysis reveals critical subject areas and influential contributions to academic research and practical implementation. For example, a topic map showing the main themes at the Intersection of the circular economy and innovation management can guide practitioners in focusing on strategies and practices well supported by academic research. This alignment between theory and practice can increase the effectiveness of innovation strategies in creating a circular economy, sustainable business model and sustainable production and consumption model.

In addition, this research can be directly applied to the management of various industries to promote circular economy practices. By identifying key authors, the frequency of their work and the consistency of their keywords, companies can act with more substantial insight and less risk and avoid common pitfalls. The collaboration networks illustrated in Figure 7 emphasize the importance of cross-disciplinary and international collaborations and show the importance of businesses fostering such partnerships to drive innovation to create circular rather than linear business. In addition, understanding the trends and referencing different issues helps organizations to identify the key success factors for increasing economic efficiency in the future and plan to achieve it.

Research results can also influence public policy by highlighting critical circular economy and innovation management areas that need support and investment. Policymakers can use these findings to optimally allocate resources, promote research and development, and foster infrastructure conducive to innovation in the circular economy. For example, the trends identified in the event graph (Table 11) and the keyword grid (Figure 13) highlight basic, emerging, niche and motor areas that could benefit from government financial and policy support. Based on this, policymakers can use these findings to have a meaningful impact in guiding 4.0 developments.

From a social point of view, the results of this research can contribute to the formation of public attitudes towards the circular Economy and innovation management. Also, this study's findings help pay attention to the social and environmental impact of innovation in production and managing innovation while developing production and improving industries by creating a circular economy as a sustainable business model has a constructive effect on the well-being of society and environmental sustainability. In addition, enhanced innovation practices influenced by this research can improve the quality of life by developing a circular economy and alternative solutions that address social challenges.

In summary, this research contributes to developing academic knowledge and illuminates practical perspectives for industry and policy. It emphasizes the importance of aligning theory and practice and reveals the multifaceted impact of circular economy and innovation management on the economy, education, politics and society.

Study Limitations

This research has no specific limitations, especially regarding the sample data collection process. A significant limitation is the lack of technical capability of the software used to integrate data from different databases during the study, which limits the analysis. Because relying only on the Scopus database for

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

sample data may lead to the exclusion of relevant information from other databases. Sample data from different independent databases must be obtained to increase the study's accuracy. In addition, modifying search keywords when querying different databases can contribute to a more comprehensive analysis. This limitation highlights the importance of future research efforts so researchers can adopt methods to collect data from multiple databases with broader keyword search strategies for a more detailed review.

Also, the quantitative nature of the data does not allow a more detailed analysis in some cases. For example, Figure 12 shows the trend of the dynamism of keywords in the last years. This figure shows that the vitality of the words has been fixed since 2024, but It is impossible to analyze it more precisely. Therefore, due to the importance of understanding this issue, future researchers must use a qualitative approach for a more detailed analysis.

In conclusion, this study increases valuable insights for researchers, mainly researchers new to the circular economy and innovation management, by clarifying future research prospects and hot debates. Researchers can quickly identify pivotal articles, prolific authors, and research topics in circular economy and innovation management. Furthermore, this study reveals emerging issues that need deeper exploration to align with circular economy goals and innovation management. The findings provide a concise and valuable overview of the field's output over the years and a suitable road map for the future direction of the circular economy and innovation management. Table 9 presents several suggestions for the future.

Table 8. Future Research Opportunities

Research Area	Future Suggestion	Argument
Data Collection	Explore the integration of data from multiple independent databases (e.g., Web of Science, IEEE Xplore, Google Scholar).	Expanding data sources will increase the comprehensiveness of future studies to overcome the limitation of absolute use of Scopus.
Keyword Refinement	Develop and test refined and expanded search keywords in database queries.	Redefining search keywords can provide a wider and more diverse range of studies related to the domain, thus providing a more accurate and in-depth analysis.
Software Capabilities	Identification and implementation of advanced software tools for bibliometric analysis.	Removing the technical limitations of current software enables the integration of data from different databases and provides more detailed analysis..
Interdisciplinary Approaches	Increasing research that combines the circular economy with other fields (e.g. economics, sociology, ecosystem studies).	Expanding the field of research to include interdisciplinary approaches can lead to the expansion of new insights and innovations and increase the scope of research..
Emerging Technologies	Increased focus on unknown emerging technologies (e.g. artificial intelligence, blockchain) in innovation management.	Aligning research with cutting-edge technologies ensures that the field remains relevant and evolves in line with 4.0 revolution.
Regional Analysis	within innovation management Conduct studies focusing on regional differences in circular economy practices.	Understanding how the circular economy and innovation management differ in different regions can provide valuable insights and practical implications for global strategies.

References

Acosta-Pérez, I., Marrero-Delgado, F. and Espinosa-Martínez, J.U., 2020. Circular economy as a contribution to sustainability in a Cuban tourist destination of sun and beach.

Alkhammash, R., 2023. Bibliometric, network, and thematic mapping analyses of metaphor and discourse in COVID-19 publications from 2020 to 2022. Frontiers in psychology, 13, p.1062943.

Aria, M. and Cuccurullo, C., 2017. bibliometrix: An R-tool for comprehensive science mapping analysis. Journal of informetrics, 11(4), pp.959-975.

Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093
Androniceanu, Armenia, Jani Kinnunen, and Irina Georgescu. "Circular economy as a strategic option to promote sustainable economic growth and effective human development." Journal of International Studies (2071-8330) 14, no. 1 (2021).
Antikainen, M. and Valkokari, K., 2016, March. Framework for sustainable circular business model innovation. In ISPIM Innovation Symposium (p. 1). The International Society for Professional Innovation Management (ISPIM).
Agbo, F.J., Oyelere, S.S., Suhonen, J. and Tukiainen, M., 2021. Scientific production and thematic breakthroughs in smart learning environments: a bibliometric analysis. Smart Learning Environments, 8, pp.1-25.
Bagdi, T., Ghosh, S., Sarkar, A., Hazra, A.K., Balachandran, S. and Chaudhury, S., 2023. Evaluation of research progress and trends on gender and renewable energy: A bibliometric analysis. Journal of Cleaner Production, p.138654.
Barros, M.V., Salvador, R., do Prado, G.F., de Francisco, A.C. and Piekarski, C.M., 2021. Circular economy as a driver to sustainable businesses. Cleaner Environmental Systems, 2, p.100006.
Bazm, S., Kalantar, S.M. and Mirzaei, M., 2016. Bibliometric mapping and clustering analysis of Iranian papers on reproductive medicine in Scopus database (2010-2014). International journal of reproductive biomedicine, 14(6), p.371.
Beske-Janssen, P., Johnsen, T., Constant, F. and Wieland, A., 2023. New competences enhancing Procurement's contribution to innovation and sustainability. Journal of purchasing and supply management, 29(3), p.100847.
Benomar, L., Elferjani, R., Hamilton, J., O'Neill, G.A., Echchakoui, S., Bergeron, Y. and Lamara, M., 2022. Bibliometric analysis of the structure and evolution of research on assisted migration. Current Forestry Reports, 8(2), pp.199-213.
Bocken, N.M., Short, S.W., Rana, P. and Evans, S., 2014. A literature and practice review to develop sustainable business model archetypes. Journal of cleaner production, 65, pp.42-56.
Carroll, J.M. and Bellotti, V., 2015, February. Creating value together: The emerging design space of peer-to-peer currency and exchange. In Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing (pp. 1500-1510).
Chiambaretto, P., Maurice, J. and Willinger, M., 2020. Value creation and value appropriation in innovative coopetition projects. M@ n@ gement, 23(2), pp.61-75.
Chychun, V., Chaplynska, N., Shpatakova, O., Pankova, A. and Saienko, V., 2023. Effective management in the remote work environment.
Danish, M.S.S. and Senjyu, T., 2023. Circular Economy.
de Lange, D.E., 2024. Circular economy international trade: An investigation of the relationship between european union circularity and international trade. Journal of Cleaner Production, 484, p.144350.
De Jesus, A. and Mendonça, S., 2018. Lost in transition? Drivers and barriers in the eco-innovation road to the circular economy. Ecological economics, 145, pp.75-89.
Del Giudice, M., Scuotto, V., Papa, A. and Singh, S.K., 2023. The 'bright'side of innovation management for international new ventures. Technovation, 125, p.102789.
Elkington, J. and Fennell, S., 1998. Partners for sustainability. Greener Management International, (24).
EMAF Ellen MacArthur Foundation (2015). Delivering theCircular economy - a Toolkit for Policymakers. Retrieved from https://ellenmacarthurfoundation.org/a-toolkit-for-policymakers.London, United Kingdom, 1, 2015, 98,
Esfahani, H., Tavasoli, K., & Jabbarzadeh, A. (2019). Big data and social media: A scientometrics analysis.
International Journal of Data and Network Science, 3(3), 145-164.
European Union, (2015). First circular economy action plan. Received from https://environment.ec.europa.eu/topics/circular-economy/first-circular-economy-action-plan_en.
Evans, S., Vladimirova, D., Holgado, M., Van Fossen, K., Yang, M., Silva, E.A. and Barlow, C.Y., 2017. Business model innovation for sustainability: Towards a unified perspective for creation of sustainable business models. Business strategy and the environment, 26(5), pp.597-608.
Falcke, L., Zobel, A.K. and Comello, S.D., 2024. How firms realign to tackle the grand challenge of climate change: An innovation ecosystems perspective. Journal of Product Innovation Management, 41(2), pp.403-427.
Freel, M., J. Robson, P. and Jack, S., 2014. Risk capital constraints to innovation in services. Journal of Business & Industrial Marketing, 29(6), pp.476-486.
Jiang, H., Chen, H., Duan, Z., Huang, Z. and Wei, K., 2023. Research progress and trends of biochar in the field of wastewater treatment by electrochemical advanced oxidation processes (EAOPs): a bibliometric analysis. Journal of Hazardous Materials Advances, 10, p.100305.
Ghisellini, P., Cialani, C. and Ulgiati, S., 2016. A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. Journal of Cleaner production, 114, pp.11-32.
Geissdoerfer, M., Savaget, P., Bocken, N.M. and Hultink, E.J., 2017. The Circular Economy–A new sustainability paradigm?. Journal of cleaner production, 143, pp.757-768.
Green, H.J., 2015. Aggregation in economic analysis (Vol. 2100). Princeton University Press.
Hans, V& K S, Yogita.,2024., AI AND CIRCULAR ECONOMY: CONCEPTS AND CONFLICTS. Juni Khyat, 14(9), p.168.
Henry Orieno, O., Ann Udeh, Ch., Itohan Oriekhoe, O., Odonkor. B., Leonard Ndubuisi, N. INNOVATIVE MANAGEMENT STRATEGIES IN CONTEMPORARY ORGANIZATIONS: A REVIEW: ANALYZING THE EVOLUTION AND IMPACT OF MODERN MANAGEMENT PRACTICES, WITH AN EMPHASIS ON LEADERSHIP, ORGANIZATIONAL CULTURE, AND CHANGE MANAGEMENT. International Journal of Management & Entrepreneurship Research. 6 (1). Pp167-190.
Hurni, D. and Grösser, S.N., 2017. Innovation Management with an Emphasis on Co-creation. Dynamics of Long-Life Assets: From Technology Adaptation to Upgrading the Business Model, pp.45-68.
Huynh, H.T.N., Nguyen, N.T.T. and Vo, N.N.Y., 2024. The influence of knowledge management, green transformational leadership, green organizational culture on green innovation and sustainable performance: The case of Vietnam. Journal of Open Innovation: Technology, Market, and Complexity, 10(4), p.100436.

Jacsó, P., 2009. The h-index for countries in Web of Science and Scopus. Online information review, 33(4), pp.831-837.

Hunger, T., Arnold, M. and Ulber, M., 2024. Circular value chain blind spot–A scoping review of the 9R framework in consumption. Journal of Cleaner Production, p.140853.

Losa, R., 2025. Public policies on circular Economy: A systematic review. Ecological Economics, 228, p.108452.

ICC & EY (2024), Putting the circular economy into motion: From barriers to opportunities. Received from www.iccwbo.org/news-publications/policies-reports/Putting-the-circular-economy-into-motion from-barriers-to-opportunities

Jabbour, C.J.C. and de Sousa Jabbour, A.B.L., 2016. Green human resource management and green supply chain management: Linking two emerging agendas. Journal of cleaner production, 112, pp.1824-1833.

Kraus, S., Bouncken, R.B. and Yela Aránega, A., 2024. The burgeoning role of literature review articles in management research: an introduction and outlook. Review of Managerial Science, 18(2), pp.299-314.

KPMG, 2015. Sustainability Report 2015. Received from https://assets.kpmg.com/content/dam/kpmg/pdf/2016/05/br-sustainability-report-2015-kpmg-summary-eng.pdf

Knight, L., Tate, W., Carnovale, S., Di Mauro, C., Bals, L., Caniato, F., Gualandris, J., Johnsen, T., Matopoulos, A., Meehan, J. and Miemczyk, J., 2022. Future business and the role of purchasing and supply management: Opportunities for 'business-not-as-usual'PSM research. Journal of Purchasing and Supply Management, 28(1), p.100753.

Krausmann, F., Lauk, C., Haas, W. and Wiedenhofer, D., 2018. From resource extraction to outflows of wastes and emissions: The socioeconomic metabolism of the global economy, 1900–2015. Global environmental change, 52, pp.131-140.

Kristensen, H.S. and Mosgaard, M.A., 2020. A review of micro level indicators for a circular economy–moving away from the three dimensions of sustainability?. Journal of Cleaner Production, 243, p.118531.

Kopnina, H & Poldner, K. (2021). Circular Economy Challenges and Opportunities for Ethical and Sustainable Business. .Routledge. P. 254.

Khajuria, A., Atienza, V.A., Chavanich, S., Henning, W., Islam, I., Kral, U., Liu, M., Liu, X., Murthy, I.K., Oyedotun, T.D.T. and Verma, P., 2022. Accelerating circular economy solutions to achieve the 2030 agenda for sustainable development goals. Circular Economy, 1(1), p.100001.

Lesnikowski, A., Ford, J.D., Biesbroek, R. and Berrang-Ford, L., 2019. A policy mixes approach to conceptualizing and measuring climate change adaptation policy. Climatic Change, 156(4), pp.447-469.

Likar, B., Hafner, A., Ropret, M., Fatur, P., Markič, M. and Pušavec, F., 2023. Smart innovation management for better business performance. JEEMS Journal of East European Management Studies, 28(3), pp.533-556.

Madanaguli, A., Sjödin, D., Parida, V. and Mikalef, P., 2024. Artificial intelligence capabilities for circular business models: Research synthesis and future agenda. Technological Forecasting and Social Change, 200, p.123189.

Martín-Martín, A., Orduna-Malea, E., Thelwall, M. and López-Cózar, E.D., 2018. Google Scholar, Web of Science, and Scopus: A systematic comparison of citations in 252 subject categories. Journal of informetrics, 12(4), pp.1160-1177.

Maziriri, E.T. and Maramura, T.C., 2022. Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. Academy of Entrepreneurship Journal, 28(1), pp.1-14.

Mingaleva, Z., Chernova, O. and Mitrofanova, I.V., 2023. Bibliometric Analysis of Research Trends in Water Management Aimed at Increasing the Sustainability of the Socioeconomic Development of a Region. Water, 15(20), p.3688.

MITECO, 2020. III Catalogue of Best Practices in Circular Economy (CBPCE). Received from https://www.miteco.gob.es/content/dam/miteco/es/calidad-y-evaluacion-ambiental/temas/economia-circular/iiicatalogueofbestpracticesincircularеconomy_tcm30-548400.pdf.

Mohammad, W.M.W. and Roseli, E.S., 2024. Bridging the green gap: Unveiling the complex interplay of national cultural dimensions, management effectiveness and corruption in driving green innovations. Journal of Climate Finance, 9, p.100050.

Mulgan, G., 2016. Good and bad innovation: what kind of theory and practice do we need to distinguish them. London: Nesta.

Mukherjee, A.A., Raj, A. and Aggarwal, S., 2023. Identification of barriers and their mitigation strategies for industry 5.0 implementation in emerging economies. International Journal of Production Economics, 257, p.108770.

Murray, A., Skene, K. and Haynes, K., 2017. The circular economy: an interdisciplinary exploration of the concept and application in a global context. Journal of business ethics, 140, pp.369-380.

Neligan, A., Baumgartner, R.J., Geissdoerfer, M. and Schöggl, J.P., 2023. Circular disruption: Digitalisation as a driver of circular economy business models. Business Strategy and the Environment, 32(3), pp.1175-1188.

O'Reilly III, Charles A., and Michael L. Tushman. Lead and disrupt: How to solve the innovator's dilemma. Stanford University Press, 2021.

Orellano, M. and Gourc, D., 2024. What typology of risks and methods for risk management in innovation projects?: a systematic literature review. International Journal of Innovation Studies.

Öztürk, O., Kocaman, R. and Kanbach, D.K., 2024. How to design bibliometric research: an overview and a framework proposal. Review of managerial science, pp.1-29.

RAJIMOL, A., GEORGE, J., JOSEPH, J., JOBIN, J., SNEHA, M.K. and BEENAMOLE, T., 2024. CHARTING NEW FRONTIERS: ASSESSING INFORMATION TECHNOLOGY'S ROLE IN THE EVOLUTION OF IMAGE ENHANCEMENT–A BIBLIOMETRIC APPROACH. Journal of Theoretical and Applied Information Technology, 102(6).

Ranta, V & A. Saari , U, (2019). Responsible Consumption and Production. Springer Nature. pp 1–12.

Journal of Ecohumanism
2025
Volume: 4, No: 1, pp. 2967 – 2996
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i1.6093

Rashid, M.I. and Shahzad, K., 2021. Food waste recycling for compost production and its economic and environmental assessment as circular economy indicators of solid waste management. Journal of Cleaner Production, 317, p.128467.

Ronaghi, M.H., 2023a. The influence of artificial intelligence adoption on circular economy practices in manufacturing industries. Environment, Development and Sustainability, 25(12), pp.14355-14380.

Ronaghi, M.H. and Fallahi, A., 2024b. How does the use of cryptocurrency affect circular economy practices in Iranian manufacturing companies?. Cleaner Engineering and Technology, 23, p.100835.

Sampedro-Beneyto, V., Agulló-Torres, A., Del_Campo-Gomis, F.J. and Arias-Navarro, I., 2024. Influence of social factors and environmental behaviour in the knowledge and opinion about circular economy. Futures, 164, p.103490.

Schröder, S., Steinmetz, N.A., Krumin, M., Pachitariu, M., Rizzi, M., Lagnado, L., Harris, K.D. and Carandini, M., 2020. Arousal modulates retinal output. Neuron, 107(3), pp.487-495.

Schotten, M., Meester, W.J., Steiginga, S. and Ross, C.A., 2017. A brief history of Scopus: The world's largest abstract and citation database of scientific literature. In Research analytics (pp. 31-58). Auerbach Publications.

Schumpeter, J.A, (1928). The instability of capitalism. The Economic Journal, 38, pp. 361-386.

Skare, M., Gavurova, B. and Rigelsky, M., 2024. Quantification of the impact of innovations in industry and infrastructure for sustainable circular economy production and consumption. Journal of Innovation & Knowledge, 9(1), p.100456.

Stavropoulos, P., Papacharalampopoulos, A., Tzimanis, K., Petrides, D. and Chryssolouris, G., 2021. On the relationship between circular and innovation approach to economy. Sustainability, 13(21), p.11829.

Şimşit, Z.T., Vayvay, Ö. and Öztürk, Ö., 2014. An outline of innovation management process: building a framework for managers to implement innovation. Procedia-Social and Behavioral Sciences, 150, pp.690-699.

Song, Y., Chen, X., Hao, T., Liu, Z. and Lan, Z., 2019. Exploring two decades of research on classroom dialogue by using bibliometric analysis. Computers & Education, 137, pp.12-31.

Suchek, N., Fernandes, C.I., Kraus, S., Filser, M. and Sjögrén, H., 2021. Innovation and the circular Economy: A systematic literature review. Business Strategy and the Environment, 30(8), pp.3686-3702.

Sweileh, W.M., Al-Jabi, S.W., Sawalha, A.F. and Zyoud, S.E.H., 2016. Bibliometric profile of the global scientific research on autism spectrum disorders. Springerplus, 5, pp.1-12.

Timilsina, B & Tieu Nguyen, Ph., (2024). From awareness to practice: Insights from the managers of Finnish circular economy pioneering companies. Journal of Cleaner Production. 480(15). https://doi.org/10.1016/j.jclepro.2024.144150

Truant, E., Giordino, D., Borlatto, E. and Bhatia, M., 2024. Drivers and barriers of smart technologies for circular Economy: Leveraging smart circular economy implementation to nurture companies' performance. Technological Forecasting and Social Change, 198, p.122954.

Tripathi, M., Kumar, S. and Babbar, P., 2018. Bibliometrics of social science and humanities research in India. Current Science, pp.2240-2247.

Parmar, Pranay Sureshbhai, and Tushar N. Desai. "A systematic literature review on Sustainable Lean Six Sigma: Current status and future research directions." International Journal of Lean Six Sigma 11, no. 3 (2020): 429-461.

Prieto-Sandoval, V., Jaca, C. and Ormazabal, M., 2018. Towards a consensus on the circular economy. Journal of cleaner production, 179, pp.605-615.

Provin, A.P. and de Aguiar Dutra, A.R., 2021. Circular economy for fashion industry: Use of waste from the food industry for the production of biotextiles. Technological Forecasting and Social Change, 169, p.120858.

Wei, W. and Jiang, Z., 2023. A bibliometrix-based visualization analysis of international studies on conversations of people with aphasia: Present and prospects. Heliyon, 9(6).

Waheed, H., Hassan, S.U., Aljohani, N.R. and Wasif, M., 2018. A bibliometric perspective of learning analytics research landscape. Behaviour & Information Technology, 37(10-11), pp.941-957.