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Circular economy strategies in the hotel industry: A bibliometric analysis

Monica Paola Lopez Garces^{1*},  Ronquillo Panchana Roger Ivan²,  Maria Jose Ortiz Zurita³

^{1,3}State University of Milagro, Milagro, Guayas Province, Ecuador.

²Catholic University of Santiago de Guayaquil, Guayaquil, Guayas Province, Ecuador.

Corresponding author: Monica Paola Lopez Garces (Email: mlopezg10@unemi.edu.ec)

Abstract

This study addresses the primary trends in research, scientific productivity, and global collaboration networks while conducting a bibliometric examination of circular economy tactics in the hotel business. Publications from databases like Scopus and Web of Science are analyzed to identify key players and the most important journals in the subject. The findings indicate a rise in scholarly work on the circular economy in the hospitality industry, emphasizing issues like resource efficiency and waste management. Despite this expansion, there are still obstacles to implementing circular practices, especially when it comes to incorporating new technologies and calculating the financial impact. It is determined that in order to encourage the implementation of these techniques and accomplish sustainability objectives in the hotel industry, cooperation between academia and industry is crucial.

Keywords: Circular economy, Hotel industry, Sustainability, Waste management.

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1. Introduction

Numerous businesses, including the hotel sector, are investigating novel approaches to reduce their environmental impact as a result of the growing concern for sustainability and the necessity of implementing responsible practices [1]. Given this, the circular economy has become a comprehensive strategy that promotes resource optimization, recycling, and reuse in order to lower waste and emissions and increase operational efficiency [2]. By encouraging resource management efficiency and improving hotel enterprises' sustainable corporate image, the circular economy not only addresses environmental issues but also provides competitive advantages [3].

Adopting circular methods in the hotel industry is associated with effective waste management, optimizing energy and water consumption, and promoting sustainable and locally produced goods [4, 5]. In addition to promoting sustainability, these initiatives address the growing demand from environmentally conscious tourists who want travel experiences that have

as little adverse effect as possible on the environment [6]. According to the literature, the hotel industry may make a substantial contribution to global sustainability goals and bring about beneficial improvements in social and commercial practices by using circular economy techniques [7].

A thorough understanding of the circular economy's application in the hotel sector is hampered by research gaps that persist despite the growing interest in the concept. A detailed examination of the major players, trends, and effects of these tactics on the industry is especially required. Through a bibliometric analysis, this study fills that gap by offering a comprehensive summary of institutional partnerships, academic production, and the primary areas of concentration for research on the circular economy in the hospitality industry.

1.1. Research Questions

1. In situations where regulation and institutional backing are limited, how might global partnerships and the incorporation of cutting-edge technologies hasten the hotel industry's adoption of circular practices?

1.2. Objective

In order to lay a strong basis for future research and the adoption of sustainable policies in the industry, the goal of this study is to perform a bibliometric analysis in order to determine the primary trends, important players, and effects of circular economy strategies in the hotel sector.

2. Methodology

In order to guarantee transparency, reproducibility, and rigor throughout the process, this study used a systematic approach based on bibliometric analysis, guided by the PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). Five crucial steps were completed to ensure the rigor and relevance of the analysis.

2.1. Database Selection

An important part of this study was selecting the databases. Because of their standing in the academic community and their capacity to offer comprehensive coverage for bibliometric analysis, Scopus and Web of Science (WoS) were chosen. With more than 25,000 active titles, Scopus is a noteworthy resource for research in a variety of fields, including business management and the social sciences [8]. According to İyibildiren, et al. [9] WoS provides access to high-impact research in interdisciplinary fields, which is especially helpful for examining the relationship between technology and tourism services. The Social Sciences Citation Index (SSCI) and Science Citation Index Expanded (SCI-EXPANDED) collections, which cover articles from 1956 and 1900, respectively, were employed in WoS to guarantee the inclusion of pertinent documents [10].

2.2. Search Equation Definition

The search formulas were customized based on each database's unique features. In Scopus, the following equation was used: TITLE-ABS-KEY("circular economy") AND TITLE-ABS-KEY("hotel industry" OR "hospitality" OR "hotels") AND TITLE-ABS-KEY("waste management" OR "sustainability" OR "resource efficiency"). For WoS, the equation applied was: TS=("circular economy") AND TS=("hotel industry" OR "hospitality" OR "hotels") AND TS=("waste management" OR "sustainability" OR "resource efficiency"). Since both searches were carried out on October 14, 2024, the data gathered was up to date and pertinent.

2.3. Inclusion and Exclusion Criteria

For both databases, precise inclusion and exclusion criteria were developed to guarantee the quality and applicability of the chosen texts [11]. Every subject area and scientific publication was included in Scopus. Furthermore, only English and Spanish-language documents were included in the search. A similar approach was used in WoS, but the emphasis was limited to articles, which are the most popular medium for sharing high-quality research. To ensure a fair comparison across the databases, English-language literature was included, just as with Scopus.

2.4. Bibliometric Analysis

Four essential elements comprise the bibliometric analysis, which enables a thorough comprehension of the dynamics of research in this field:

1. Productivity and Citations: Assessment of scholarly output and the influence of publications.
2. Sources: Identification of the most influential journals and conferences in the area.
3. Institutional and Country Contributions: Analysis of the most active actors in research.
4. Intellectual Structure: Exploration of the co-occurrence network of author keywords.

2.5. Software Selection

For data analysis, RStudio was used in conjunction with the R language (version 4.4.1), incorporating the tidyverse library for processing and analyzing data related to authors, journals, and countries. Additionally, VOSviewer (version 1.6.20) was employed for network analysis, which allowed for the visualization of collaboration and co-citation structures among authors, as well as the identification of thematic trends through keyword analysis.

3. Results

The initial search yielded 101 documents in Scopus and 42 in WoS. After applying the inclusion and exclusion criteria, a total of 96 documents were selected: 59 from Scopus and 37 from WoS. Subsequently, the "left_join" function from the "dplyr" package was used to identify duplicate documents between both scientific databases, and 25 duplicate documents were found, leaving a total of 71 documents for analysis: 34 from Scopus, 12 from WoS, and 25 from both databases.

The bibliometric analysis was structured into several key dimensions. First, an analysis of productivity and citations was conducted to identify the most prolific authors and the most cited documents. Second, the main sources that published the documents were analyzed. In addition, the most active institutions and countries in this research area were evaluated, identifying the main contributions at the international level. Finally, an analysis of the intellectual structure was conducted using institutional collaboration networks and keyword co-occurrence.

3.1. Productivity and Citations Analysis

Figure 1 shows the evolution of scientific productivity and citations related to the topic of study between the years 2018 and 2024.

3.2. Scientific Productivity

In terms of productivity, a general growth trend is observed over the years. In 2018, four documents were published, while in 2019, the number decreased to one document. Starting in 2020, productivity showed a significant increase with eleven publications, reaching its peak in 2023 with fifteen documents. This continuous increase in academic output indicates that the circular economy in the hotel industry has gained considerable attention in recent years.

By 2024, although the year is not yet complete, 13 documents have already been recorded, suggesting that productivity will remain strong compared to previous years. The constant rise in publications highlights the growing importance of the topic, which can be attributed to the interest in promoting sustainable practices in the hotel sector.

3.3. Citations Received

The citation analysis shows that while productivity has increased, the impact in terms of citations has been more volatile. In 2018, the 4 published documents generated 143 citations, indicating a good level of impact. However, in 2019, despite only 1 document being published, it received 74 citations, also reflecting its relevance.

The year 2020 was the most notable in terms of citations, with 453 citations from the 11 documents published. This high number of citations suggests that the work from that year was highly influential in the field of circular economy and hotel sustainability. In 2021, although a greater number of documents were published (14), the number of citations decreased slightly to 323, which is still a significant number.

In the following years, citations showed a downward trend. In 2022, despite 13 documents being published, citations dropped significantly to 98. In 2023, the number of citations rose moderately to 136, and as of 2024, 63 citations have been recorded for the 13 documents already published.

3.4. Relationship between Productivity and Citations

Despite the constant growth in academic output, the number of citations has shown a decline since 2021. This may be due to several factors, such as increasing competition in research on the circular economy in other sectors or simply the fact that more recent work has not yet had enough time to be widely cited.

Figure 1 reflects a positive trend in terms of academic production on the circular economy in the hotel industry. However, the impact measured by citations has been more variable, with 2020 and 2021 standing out. It is likely that citations for more recent documents will increase over time as they become more integrated into academic and practical discussions in the sector.

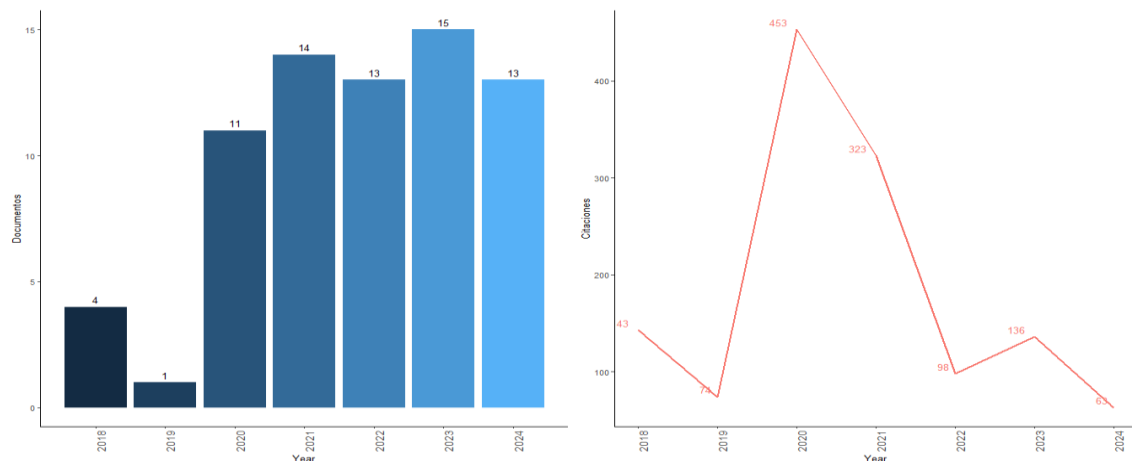


Figure 1.
Annual Evolution of Publications and Citations.

The first articles were published in 2018, with four studies released that year. The study by Fieschi and Pretato [12] is the third most influential of these four documents (58 citations). Between 88 and 100 million tons of food waste are produced in Europe each year, according to Fieschi and Pretato [12], and this has a major negative influence on the environment in terms of CO₂ emissions. Twelve percent of this waste is attributable to the hospitality industry, which includes eateries and catering services. The management of this waste can be significantly impacted by the selection of dinnerware and utensils. When compared to conventional plastic tableware, a comparative analysis reveals that the best sustainable choice in terms of carbon, water, and resource footprints is to use biodegradable and compostable tableware in conjunction with the recycling of organic waste. This approach can be used in the hotel sector to lessen its environmental impact and is consistent with the circular economy's tenets.

The study by Pamfilie, et al. [13] on the circular economy in Romania's hotel business was the second most important document in that year (2018) with 41 citations. This study examines the potential effects on hotels' financial and environmental performance of implementing integrated management systems based on ISO 9001, ISO 14001, and OHSAS 18001 standards. Nevertheless, the authors come to the conclusion that despite advancements, the Romanian hotel industry is not yet ready to embrace the concepts of the circular economy since management systems are not effectively integrated, and customer demand for sustainable practices is low.

Also in 2018, according to Menegaki [14] the circular economy has emerged as a priority on the agendas of global economic, environmental, and social institutions. The author highlights that, although the European Commission has placed particular emphasis on zero waste reduction, the concept of the circular economy encompasses much more than that. Menegaki [14] underscores the importance of tourism to Greece's economy, implying that Greek hotels are increasingly focused on adopting sustainable practices to improve their economic performance and attract environmentally conscious tourists.

In 2019, there was a 75% decrease in the number of publications; however, this single study achieved the second-highest impact (74 citations) among the 71 documents analyzed. The work by Jones and Wynn [15] offers an accessible exploratory review of how academics and businesses approach the circular economy, natural capital, and resilience in the hospitality industry. It highlights the need to explore how information systems can better support these concepts and the general management of sustainability.

The most impactful document (338 citations) is the research by Pencarelli [16] which analyzes the changes in the digital tourist experience before, during, and after travel, as well as the challenges for tourist destinations and ecosystems from a smart perspective. The study concludes that in the future, tourist destinations will not only need to adopt digital innovations but also incorporate circular economy principles.

Another notable document (46 citations) is the study by Camilleri [17] which focuses on sustainable food production and consumption in tourist cities through the implementation of circular economy policies. This work analyzes practices in hotels and restaurants that aim to minimize food waste through preventive measures, recycling, and the use of technologies such as composting and energy generation from organic waste.

3.5. Source Analysis

In total, the 71 documents were published in 46 different journals. Table 1 presents the journals that have published more than one document on the topic of study, and Table 2 shows the journals that have obtained the most scientific impact measured by the number of citations.

Table 1 shows the journals with more than one published document on the topic of study. This table highlights the main academic dissemination sources where studies on this topic have been concentrated.

The journal *Sustainability* (Switzerland) leads the list with 12 documents, indicating its relevance as one of the main publishing outlets for research focused on sustainability and the circular economy. The presence of this journal in the top spot reinforces its focus on topics that combine sustainability with various sectors, including tourism and hospitality. In this journal, studies have focused on sustainable production and consumption in tourist cities through the circular economy (Camilleri [17]). Another study published in this journal implemented a circular economy model based on waste reduction and the integration of the local community into sustainable practices. The study by Ahmed, et al. [18] describes how the leadership of the hotel (Frangipani Langkawi Resort and Spa in Malaysia) has promoted environmental and socio-economic development through the adoption of organic farming, waste management, and the use of renewable energies. In the same journal, Rubino, et al. [19] highlight the importance of adopting circular strategies in the hotel industry, such as the reuse and recycling of construction materials, particularly in urban areas where heritage preservation is key. This reinforces the need for integrated urban planning that fosters both environmental sustainability and economic development around heritage sites. Vardopoulos, et al. [20] explore how smart tourist cities can use emerging technologies to promote cultural sustainability and real estate development, directly impacting the hotel sector. This approach combines the sustainable management of urban resources with the valorization of tourist and cultural assets, creating an ideal platform for adopting circular economy principles within the hotel industry.

Following *Sustainability* (Switzerland) is the journal *Worldwide Hospitality and Tourism Themes* with 6 documents. This publication stands out for its focus on the hospitality industry, demonstrating the growing interest in applying sustainable practices within this specific sector. The most prominent document (11 citations) in this journal is the study by Stombelli [21], which indicates that socio-economic engagement and factual certainty should be improved, and hospitality businesses must play a role in both measuring and publishing the benefits of committing to Corporate Social Responsibility (CSR) and funding sustainability research. If this happens and the UN's Sustainable Development Goals (SDGs) are met, the future will benefit from a circular economy where resources are not discarded but maintained, repaired, reused, refurbished, and renewed.

before being recycled. Another study published in this journal, which reached 10 citations, suggests that the proper utilization of the SDGs would be excellent drivers of the circular economy in the hotel sector [22].

The British Food Journal follows with three articles, suggesting that the circular economy in the hotel sector is also being investigated from a food and responsible consumption standpoint. The study of Bowen, et al. [23] is noteworthy in this publication. The study looks into how small and medium-sized businesses (SMEs) in the UK's hospitality industry responded to the pandemic problem by embracing circular economy principles and taking steps to improve local supply chains, reduce waste, and recycle. High costs and a lack of resources were major obstacles to these companies' desire to participate in circular operations. The essay also highlights how important it is to collaborate with the community in order to solve challenges and promote greener practices. The authors draw the conclusion that circular economy tactics help SMEs withstand economic hardship and promote environmental sustainability, both of which are critical in the post-pandemic setting.

The Scandinavian Journal of Hospitality and Tourism, Journal of Cleaner Production, International Journal of Contemporary Hospitality Management, Circular Economy and Sustainability, and Sustainable Production and Consumption all have two publications. This collection of journals, which range from publications that are especially focused on hospitality to more general sustainability and clean production techniques, demonstrates the wide-ranging and interdisciplinary interest in the circular economy in the hotel business. For instance, Hadzi-Nikolova, et al. [24] examined the application of circular economy strategies in the management of biological waste in North Macedonia's tourist areas in the journal Circular Economy and Sustainability. They concentrated on the use of cutting-edge technologies such as the "Pay-As-You-Throw" (PAYT) system and Autonomous Composting Units (ACUs) in Probishtip. By making it possible to separate and compost organic waste, these technologies encourage lodging facilities and dining establishments to produce less trash and support regional sustainability. Reduced landfill waste, smaller carbon footprints, and heightened environmental consciousness are some advantages. According to the study, the hotel industry can support the circular economy by adopting similar solutions in other tourist destinations. According to another study, even though some companies have included circular economy ideas in their sustainability plans, there are still obstacles in the way of fully implementing them in management. The study suggests that information systems can be extremely helpful in facilitating the shift to more sustainable practices [15].

Table 1 reveals that research on the circular economy in the hotel industry is mainly concentrated in journals focused on sustainability, tourism, and hospitality, underscoring the growing importance of this field in the academic domain.

Table 1.
Journals with the highest number of publications.

Journal	Documents
Sustainability (Switzerland)	12
Worldwide Hospitality and Tourism Themes	6
British Food Journal	3
Circular Economy and Sustainability	2
International Journal of Contemporary Hospitality Management	2
Journal of Cleaner Production	2
Scandinavian Journal of Hospitality and Tourism	2
Sustainable Production and Consumption	2

Table 2 presents the main academic sources ranked by the number of citations received in the field of "Circular Economy Strategies in the Hotel Industry." This analysis allows us to identify which journals have had the greatest academic impact within this topic, measuring the influence of publications through citations.

At the top of the list is the journal *Information Technology and Tourism* with 338 citations. This figure suggests that the single study published in this journal has had a significant impact on the academic community, probably due to the growing intersection between information technology and sustainability solutions in tourism—a key area within the circular economy applied to hospitality [16].

Next is *Sustainability (Switzerland)* with 253 citations. This is a considerable number, confirming that, besides being the journal with the most publications (according to Table 1), it is also one of the most influential in terms of citations. This reinforces its central role in the dissemination of research on sustainability, making it a key source for circular economy topics [25].

The *International Journal of Contemporary Hospitality Management* occupies the third place with 74 citations. Although it has only one publication compared to other journals with more than one publication, the citations received indicate its relevance within the hospitality sector.

In fourth place is the *Scandinavian Journal of Hospitality and Tourism* with 68 citations, suggesting that the studies published in this journal have also had a considerable impact, especially in the Scandinavian region, where sustainable tourism has received special attention. The study by Sorin and Sivarajah [26] gathers opinions from ten managers of Scandinavian hotel chains. The study's findings demonstrate the respondents' interest in the circular economy and their introductory to intermediate level of comprehension.

With 58 and 51 citations, respectively, Waste Management and Waste Management and Research come in second and third. These two journals' inclusion in the table highlights how crucial waste management is to the circular economy, particularly in the hotel sector where trash reduction is becoming more and more important [5, 12].

With 77 citations, the journal *Amfiteatru Economic* also makes a significant contribution. Its inclusion here suggests that its papers about the circular economy are being widely cited, even though it is not at the top of the list in terms of published

documents. According to a study published in this journal by Pamfilie, et al. [13], the hotel industry's shift to a circular economy will necessitate a deeper integration of environmental management with quality and safety systems.

Finally, *Worldwide Hospitality and Tourism Themes* has 33 citations, suggesting that although this journal has a relatively high number of publications on the topic, its impact, as measured by citations, is lower compared to other journals mentioned.

Table 2 shows that, although some journals publish a large number of articles on the circular economy, citations are not always directly correlated with the number of documents. The most influential journals, such as *Information Technology and Tourism and Sustainability (Switzerland)*, have both a significant volume of publications and a high number of citations, positioning them as key sources in this field. Other journals, like *Waste Management and Amfiteatru Economic*, despite publishing fewer documents, have a considerable academic impact in terms of citations.

Table 2.

Leading journals by number of citations.

Journal	Citations
Information Technology and Tourism	338
Sustainability (Switzerland)	253
International Journal of Contemporary Hospitality Management	74
Scandinavian Journal of Hospitality and Tourism	68
Waste Management	58
Waste Management and Research	51
Amfiteatru Economic	77
Worldwide Hospitality and Tourism Themes	33

3.6. Analysis of Institutional and Country Contributions

Figure 2 shows an academic collaboration graph that reflects the cooperation network among various academic and research institutions. This type of visualization is commonly used in bibliometric analyses to show the level of interaction and collaboration between different entities in scientific production.

In this graph, the nodes represent institutions, while the lines connecting these nodes indicate the existence of collaborative relationships, such as co-authorships in scientific publications. The density and thickness of the lines suggest the frequency and level of cooperation between institutions. In this case, a dense network with multiple interconnections is observed, indicating that the represented institutions work collaboratively on multiple projects or studies related to sustainability and the circular economy in hospitality.

One of the most prominent nodes is Zapounidis, et al. [27], which appears to be connected with most other institutions, indicating its central role in this research network. This institution seems to act as a key point of collaboration, likely leading projects or coordinating research involving other organizations. Other notable institutions include the Laboratory of Solid Waste & WA, Faculty of Natural and Technical Sciences, Faculty of Economy at Goce Delcev University, and Goce Delcev University in Shtip, all of which have numerous connections linking them to other entities in the network.

The global cooperation within this network is an intriguing feature. This research group operates internationally, as evidenced by the presence of several institutes in various countries, including Katerini, Greece; Yermasoyia, Cyprus; and Probishtip, North Macedonia. Studies addressing global concerns like waste management and sustainability, which are likely the focus of these institutes, frequently involve this kind of cooperation.

It is likely that many of the collaborations are centered on issues pertaining to environmental sustainability, the circular economy, and solid waste management because the Laboratory of Amoah and Kosoe [28] is one of the important institutes. Due to the need to discover more sustainable solutions for resource management and waste reduction, particularly in industries like tourism and hospitality, these themes are becoming more and more important in contemporary research.

In summary, Figure 1 shows a network of academic and research institutions with a high degree of cooperation, especially in the field of sustainability and the circular economy. International collaborations stand out as a key factor for the success of these studies, suggesting that the institutions involved are committed to seeking global solutions to environmental challenges.

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In conclusion, Figure 2 depicts a very cooperative network of academic and research institutions, particularly in the areas of sustainability and the circular economy. The success of these studies is largely attributed to international collaborations, indicating the institutions' dedication to finding global solutions to environmental problems.

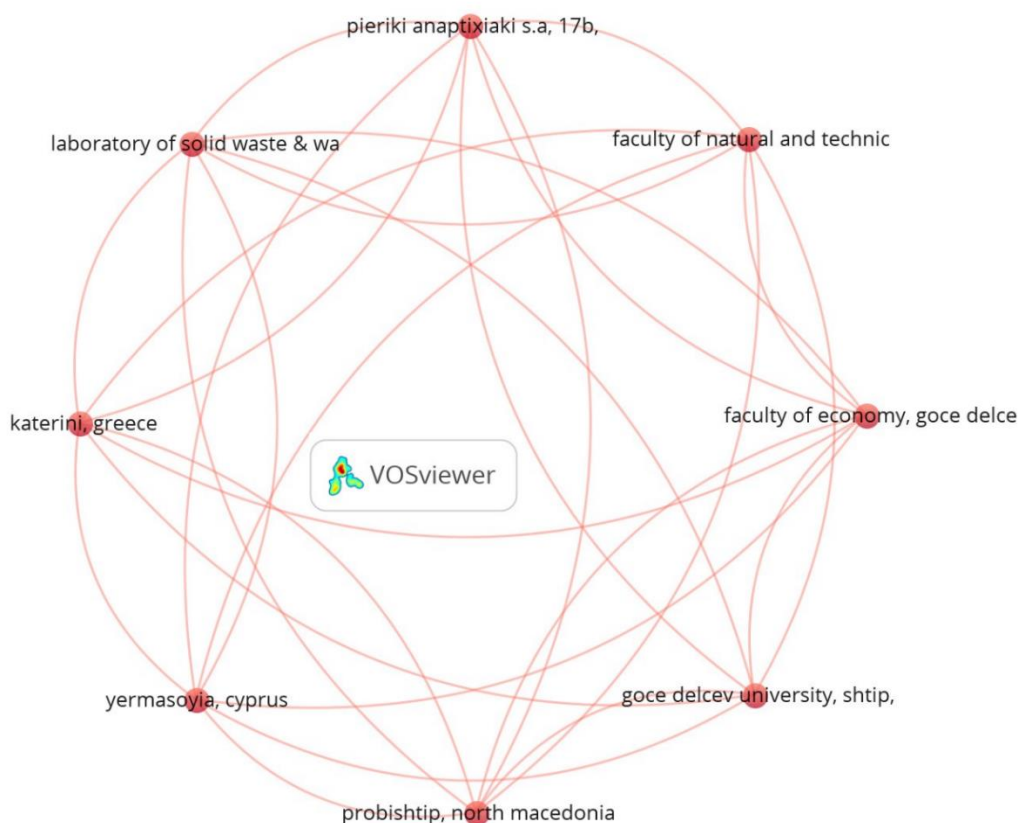


Figure 2.
Academic Collaboration Network.
Source: Zapounidis, et al. [27] and Amoah and Kosoe [28]

A transnational network of collaboration between multiple nations is shown in Figure 3. By showing the countries with the most participation in joint publications and their interactions with one another in the academic community, this figure enables us to examine the distribution of scientific cooperation across various countries.

3.8. Analysis of International Collaboration

The United Kingdom emerges as the most prominent country in terms of scientific collaborations, with the largest node and numerous connections with other nations. This indicates that the United Kingdom plays a key role in research on topics like the circular economy, sustainability, and tourism, acting as a hub for coordinating multiple international research projects. The strong participation of the United Kingdom underscores its importance within the global scientific community about these topics. A recent study by UK researchers explored the potential of interviewing food service providers and farmers, demonstrating that stakeholders are willing to adopt industrial symbiosis for food waste recovery. This adoption could also strengthen social capital and networks among these stakeholders. To promote greater adoption, policymakers are encouraged to foster cross-sector capacity building that connects food services with farmers, which would not only reduce food waste but also contribute to the creation of more resilient and responsive supply chains [29].

Nevertheless, despite having a little smaller node than the UK, the Netherlands also shines out in the network. This nation exhibits a high degree of international engagement, which reflects its importance in cooperative scientific creation in

fields like resource management and sustainability. Because of its emphasis on creative and sustainable approaches to waste management and the circular economy, the Netherlands has played a significant role in international research [7, 30].

The network also shows other nations with smaller nodes, including Finland, Sweden, Canada, France, Russia, and the United States. These countries actively participate in collaborative research, but on a lower scale than the UK or the Netherlands, as evidenced by the fact that, despite having smaller nodes, they are connected to many countries. For instance, France and the United States have extensive international connections, indicating active involvement in international research networks, especially in interdisciplinary fields like sustainability.

The regional cooperation between Nordic nations, such as Finland and Sweden, is noteworthy because of their close ties with one another. Research on sustainability and resource management, areas in which Nordic nations have led the way, may be the main emphasis of this kind of collaboration.

3.9. Connections and Global Collaboration

Widespread international cooperation is indicated by the graph's flowing and evenly distributed lines connecting the different nations. Through these relationships, nations can share information and insights, leading to collaborative studies on global issues including waste management, climate change, and the circular economy. It appears that nations like the Netherlands and Russia serve as bridges, connecting remote areas and promoting the exchange of ideas.

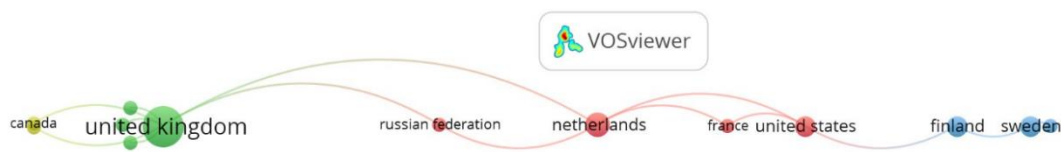


Figure 3.
International Collaboration Map.

3.8. Analysis of Intellectual Structure

A map of important phrases used in circular economy studies is shown in Figure 4, which was created using VOSviewer. The nodes in this graph represent ideas or keywords that have been commonly used in circular economy-related research, and the lines that connect them illustrate how these phrases relate to one another in the scientific literature. In joint research, the proximity between terms indicates the correlation or co-occurrence, while the size of the nodes reflects the frequency of occurrence of the terms.

3.9. Main Concepts

The term "circular economy," which is in the middle of the map and linked to a wide range of other ideas, is the most noticeable one in the graph. This suggests that the majority of the research shown in the graph focuses on the circular economy, which is connected to a number of subthemes in the field of sustainability Fieschi and Pretato [12] and even in relation to the COVID-19 pandemic [31].

There are a number of important ideas that surround the word "circular economy," including "sustainable development," "hospitality," "tourism," and "food waste." The relationship between these themes and the circular economy demonstrates how circular and sustainable practices have been incorporated into different facets of the hospitality and tourism sector, especially with regard to waste and resource management [32-34].

3.10. Key Subtopics

- **Sustainable Development:** The circular economy and the node "sustainable development" are strongly related, suggesting that a large portion of the literature in this area is related to the aims of sustainable development [35, 36]. Linked to phrases like "climate change," "adaptive reuse," and "environmental strategy," this idea implies that circular strategies are an important way to reduce environmental impact and advance sustainability [37, 38].
- **Hospitality and Tourism:** Additionally, "hospitality" and "tourism" are closely associated with the circular economy. This illustrates how these industries have improved their environmental effect by implementing sustainable practices [39, 40]. The existence of subtopics such as "supply chain," "cultural tourism," and "hotel industry" suggests that efforts to promote the circular economy have spread to other facets of hotel management, such as cultural preservation and the supply chain. Through the removal of middlemen and the purchase of locally produced goods and waste reduction, circularity in supply chains encourages a more direct and effective relationship between hotels and local suppliers. By assisting local producers and establishing more robust and sustainable sourcing methods, this approach not only helps cut waste but also boosts local economies [41].
- **Food Waste and Waste Management:** Two other crucial subtopics are "food waste" and "waste management." Both have a direct bearing on the circular economy, which highlights how crucial it is to cut waste in the travel and hospitality industries. The existence of ideas like "surplus food" and "circular practices" indicates that increasing

sustainability and efficiency in the management of food resources is becoming more and more important. The study by Parsa, et al. [42] explores several approaches to managing food waste and shows that cutting back on and reusing excess food in industries like retail and catering has a favorable effect on the economy and society in addition to the environment.

- COVID-19 and its Impact on the Circular Economy: A link between "COVID-19" and the circular economy may be seen on the graph's right side, which illustrates how the pandemic has affected the adoption of sustainable practices. A reassessment of hospitality and tourist practices has been driven by the COVID-19 problem, which has encouraged the adoption of more sustainable solutions [19, 31].

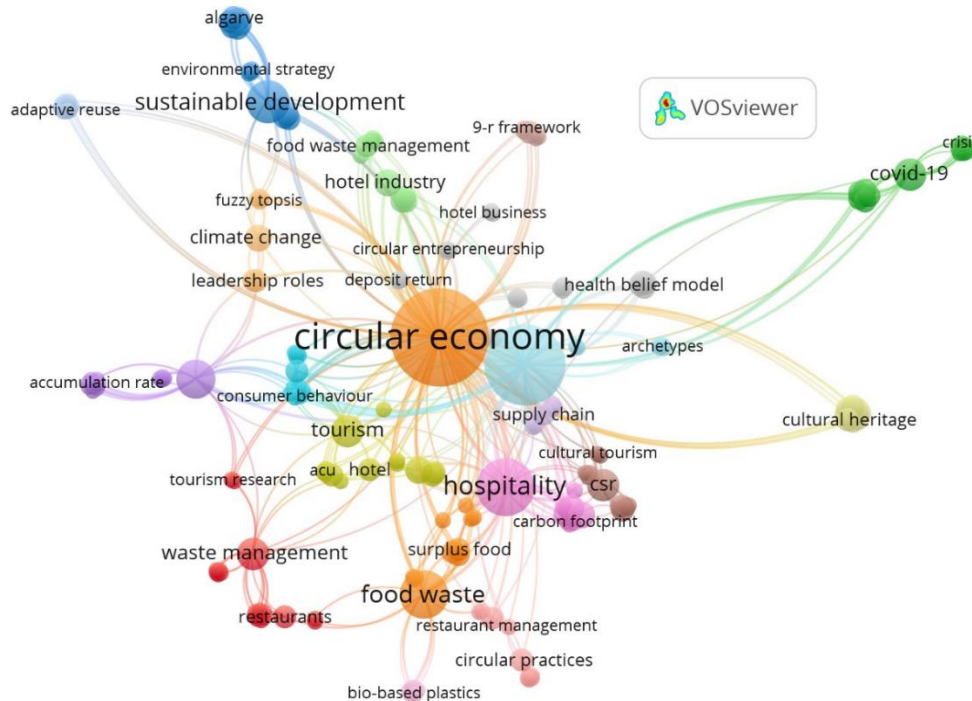


Figure 4.
Keyword Co-occurrence Map.

4. Discussion

The hotel business, a crucial sector for global sustainability because of its substantial influence on waste generation and the consumption of natural resources, is showing increasing interest in the circular economy, according to this bibliometric investigation. The hotel sector has started implementing circular methods to enhance its economic and environmental performance as sustainability has gained prominence on global agendas. However, the analysis shows that even with the recent increase in scientific output, there are still many unanswered questions that prevent a thorough understanding of how the circular economy is being applied in this industry.

The main emphasis on waste management, especially food waste, as a crucial tactic for promoting circularity, is among the most significant findings. The adoption of compostable dinnerware and the implementation of waste management regulations are two important ways to reduce waste, according to studies like those by Fieschi and Pretato [12] and Camilleri [17]. In addition to addressing environmental issues, these strategies provide hotels with a competitive edge by lowering operating expenses and enhancing their standing with customers who are becoming more conscious of how their purchases affect the environment. However, the sector's adoption of these circular processes is still inconsistent and is primarily influenced by variables such as corporate size, geographic location, and access to sustainable technologies.

The active involvement of European nations, especially the United Kingdom and the Netherlands, in studies on the circular economy in the hotel sector is another important factor noted in the report. Due to stringent environmental laws and a growing regional demand for sustainable practices, European nations appear to be spearheading research and the adoption of circular solutions, as evidenced by international collaboration as seen in the academic cooperation network. Government assistance for research and the creation of innovative resource management solutions may also contribute to these nations' prominence. Developing nations' limited involvement in international collaboration networks, however, emphasizes the necessity of advancing studies and regulations that support the circular economy's adoption in areas with restricted access to sustainable technologies.

Since 2020, there has been a noticeable rise in scientific output, which has coincided with the increased worldwide awareness of the need to shift to more sustainable economies. The Sustainable Development Goals (SDGs), which require companies, including the hospitality sector, to adopt more responsible practices to lessen their environmental impact, seem to be the primary cause of the recent spike in publications in this area. The citation analysis shows that the impact of this research has fluctuated despite this rise in scholarly production. Even though there have been more publications in recent

years, the effect in terms of citations has declined. This may be explained by the topic's relative novelty, which suggests that more time is needed for the research to be widely accepted and referenced in scholarly works.

The connection between the circular economy and the social and economic facets of hotel management is among the least studied topics in the literature. Fewer studies have examined the effects of circular practices on financial results and the interaction between hotels and local communities, despite the majority of studies concentrating on waste reduction and resource efficiency [39, 42]. According to the literature, hotel firms can become more competitive by implementing sustainable practices that enhance their efficiency and reputation [38]. There are, however, insufficient empirical studies assessing the true economic impact of these tactics in various settings, especially emerging economies. Furthermore, although customers' preferences are moving toward more sustainable experiences, it is still unclear how much they are ready to pay for these services, therefore further research is required to understand their involvement in the adoption of circular practices.

The analysis also emphasizes the significance of specific journals that have been essential in spreading research on the circular economy in hospitality, including Sustainability (Switzerland) and Worldwide Hospitality and Tourism Themes. The prominence of these journals points to an interdisciplinary interest that extends beyond sustainability to include hospitality and tourism, highlighting the circular economy's applicability as a cross-cutting strategy that can be used in a variety of economic sectors. The scattering of research across different publications, however, also points to a lack of field-wide consolidation, which may impede researcher collaboration and the effective exchange of knowledge.

The hotel industry's low adoption of emerging technology in the application of circular processes is another noteworthy conclusion. Although some studies, such as Pencarelli [16] highlight the role of digitization and technology in transforming the industry, most research on the circular economy in hospitality has not addressed how technologies like artificial intelligence or the Internet of Things can facilitate the adoption of circular models. Future study is made possible by the potential for resource and waste management to be optimized through the use of cutting-edge technologies, which would increase productivity and make it easier to track how hotel operations affect the environment.

5. Conclusion

According to this bibliometric analysis, the circular economy in the hotel sector is becoming increasingly popular as a pertinent and important area of study. In addition to meeting the rising expectations for sustainability, circular practices—such as waste management and resource optimization—offer the hotel industry a chance to enhance operational effectiveness and reputation among consumers who are becoming more environmentally conscious.

Despite advances in research, there are areas that require more attention, such as the long-term economic impact of circular practices and their integration into broader management systems. Additionally, future research must address the barriers that hinder the implementation of the circular economy in different hotel contexts, particularly in developing countries where a lack of resources and weak infrastructure present significant challenges.

Finally, this study emphasizes the importance of international collaborations to foster a wider adoption of the circular economy in the hotel industry. It is essential that academic, governmental, and business actors continue working together to develop innovative solutions that enable an effective transition toward more sustainable and circular models in the sector.

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