Sustainability in the Circular Economy: A Systematic Literature Review

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ABSTRACT

The interest of this study lies in the fact that the transition from a linear to a circular economy is of key interest in relevant business and academic fields, although the circular economy is an emerging issue and theoretical and empirical research has been limited until recently. However, circular business models are receiving more and more attention, and it is therefore strategically necessary to develop tools that facilitate their implementation. Therefore, because of increasing interest amongst research in the circular economy and sustainability, the purpose of the present study and its strength lies in the systematic presentation of both of these specific academic streams. The approach was qualitative and based on a systematic literature review. We examined several areas in which the circular economy has a place. We highlight sustainability, consumer behaviour, innovation, remanufacturing operations management, supply chains, intellectual capital, 3D printing, big data, and recycling. We also consider drivers, challenges, the relationship between circular economy and small to medium-sized enterprises, and the influence of circular economy in specific sectors such as textiles and food. It is hoped that the study will facilitate a possible sustainable solution that contrasts with the current linear model of production and resource management. The circular economy has the potential to create positive synergies in economic, social,and environmental areas, despite its recent origin.

Keywords: *Circular Economy, Sustainability, Environment, Management, Systematic Review*

1. INTRODUCTION

The reason that justifies the need for the circular economy (CE) lies in the increase in the world population and the manufactured of consumer goods that are summarily discarded, probably because of the rapid and dynamic technological change. All of this is seriously affecting the environment *(All wood et al., 2011).* Humanity is facing serious ecological problems – climate change, pollution, deforestation, soil degradation, species extinction and the loss of biodiversity. Immediate action must be taken to compel the sustainable use of natural resources and the recycling of waste. This will protect the planet and its resources, and the CE can play a part. This

background highlights the importance of addressing what is presently a significant research gap. It is hoped that the provision of an integrated theoretical CE framework will contribute to the *United Nations Sustainable Development Goals (SDGs) for 2030.* At the same time, the CE favours competitiveness and innovation, leading to desirable corporate financial returns and further economic development *(United Nations, 2015).* The present study recognises the importance of SDG Number 12 —"responsible production and consumption"— Which seeks both economic growth and sustainable development. A radical change in current modes of production and consumption is needed. The aim of the present study and its strength lies in the systematic presentation of a specific academic theme, the CE and Sustainability so that it can be explored in greater depth. The study provides an overview of the topic and sets an agenda for future research. The remainder of the study is organised as follows. Section 2 provides the background to the CE, as well as a definition of the concept itself. Section 3 provide the literature review of the CE. Section 4 presents the study methodology, including the selection and analysis of the sample. The results are discussed in Section 5. The CE is considered in relation to a series of dimensions that have acquired great importance within the literature. Section 6 contains the most relevant conclusions and the most significant contributions of the study. Its limitations, future research directions and managerial implications also can be found in Section 6.

2. THE CIRCULAR ECONOMY

The current make-use-dispose model is pushing planetary boundaries and with the existing increasing trend of population growth, it is expected that the demand for raw materials will double in the next forty years *(EC, 2018) and (EC, 2021).* The energy demand will also increase, as there is a positive correlation between greater wealth and energy consumption (*Malinauskaite et al., 2017) and (Farooq, S. 2019).* The world is being confronted with serious issues such as an increase in carbon dioxide emissions, plastic pollution in the oceans, and an increase in waste material due to following the linear model of make-use-dispose (*Technol., 2021) and (Nairobi, Kenya, 2018).* Climate refugees, namely, people who will be forcibly displaced because of climate change, is another serious issue the world has started facing most recently (*Ahmed, 2018).* It is therefore necessary that we adopt a sustainable lifestyle and replace the linear economy with the Circular Economy approach. While on one hand circular economy has the potential to decouple economic growth from resource consumption, it also increases environmental sustainability by enhancing resource efficiency *(J. Clean. Prod., 2017) and (Hartikainen, E., 2018).* The CE is currently a "hot topic" amongst academics and professionals as there is an exponential increase in the number of publications appearing in the leading research journals (*Kirchherr et al., 2017).* A cursory search in the leading research database – Web of Science –found that from 2014 to 2019 the number of articles discussing CE topics had risen from 4 in 2024 to around 1700 in 2019 (*Higgins J, 2011)*. Recently, *Kirchherr et al. (2017)*

carried out a comprehensive analysis of existing literature on CE and pointed out CE is gaining immense importance in the current research trends; however, its basic concepts are still emerging. For instance, Kirchherr and colleagues (2017) reported that there are 114 definitions of CE exist in the literature *(127, 221-232).* Circular Economy (CE) research delves into a multitude of themes, all orbiting around the core concept of transitioning towards a system that minimizes resource depletion, waste generation, and environmental impact. While waste management and sustainability are undoubtedly central pillars, several other crucial themes occupy the minds of CE researchers:

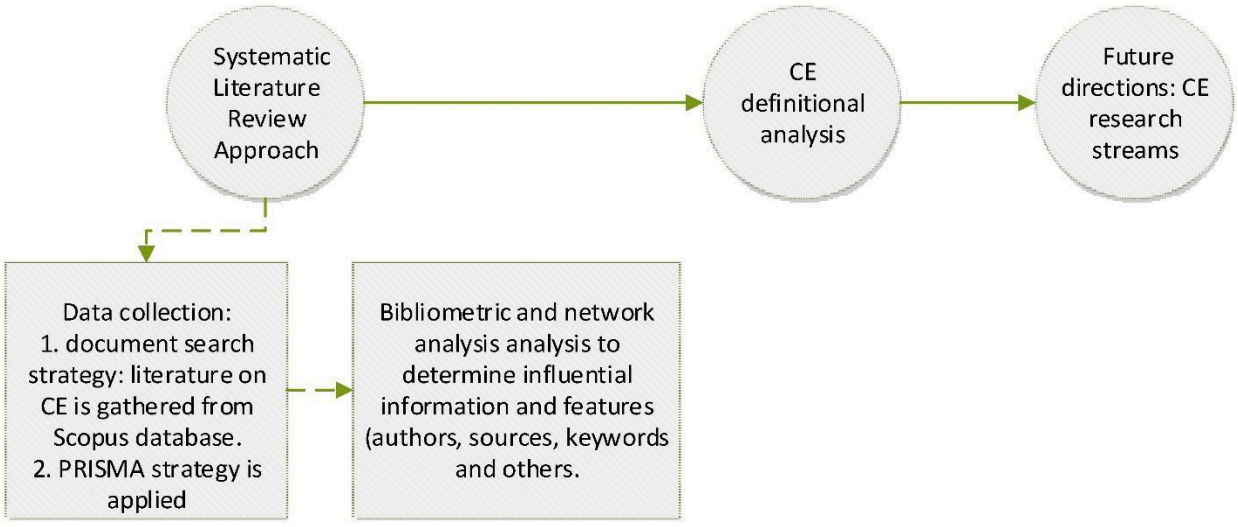
Design for Circularity: This theme focuses on rethinking product design and manufacturing processes to prioritize reusability, repair ability, and recyclability. This involves using durable materials, modular components, and designing for disassembly *(Jauernig, J. 2018).*

Business Model Innovation: Transitioning to a circular economy requires rethinking existing business models. Researchers explore novel approaches like product-service systems, where ownership remains with the manufacturer, and consumers pay for the use of the product or service *(Ghisellini, P. 2016).*

Policy and Governance: Implementing CE requires supportive policies and regulations. Researchers analyze existing policies, identify gaps and barriers, and propose new frameworks to incentivize circular practices and discourage linear, wasteful models *(O'Hara, S. 2017).*

Social and Economic Implications: Transitioning to CE has potential social and economic ramifications. Researchers explore the potential job creation, economic growth, and distributional impacts of CE, ensuring a just and equitable transition for all stakeholders *(Geissdoerferet, 2018).*

Regional and Sectoral Applications: CE principles can be applied to various sectors and regions with specific considerations. Researchers explore the unique challenges and opportunities for implementing CE in sectors like agriculture, construction, electronics, and textiles, as well as in different geographical contexts *(Webster, 2017).*



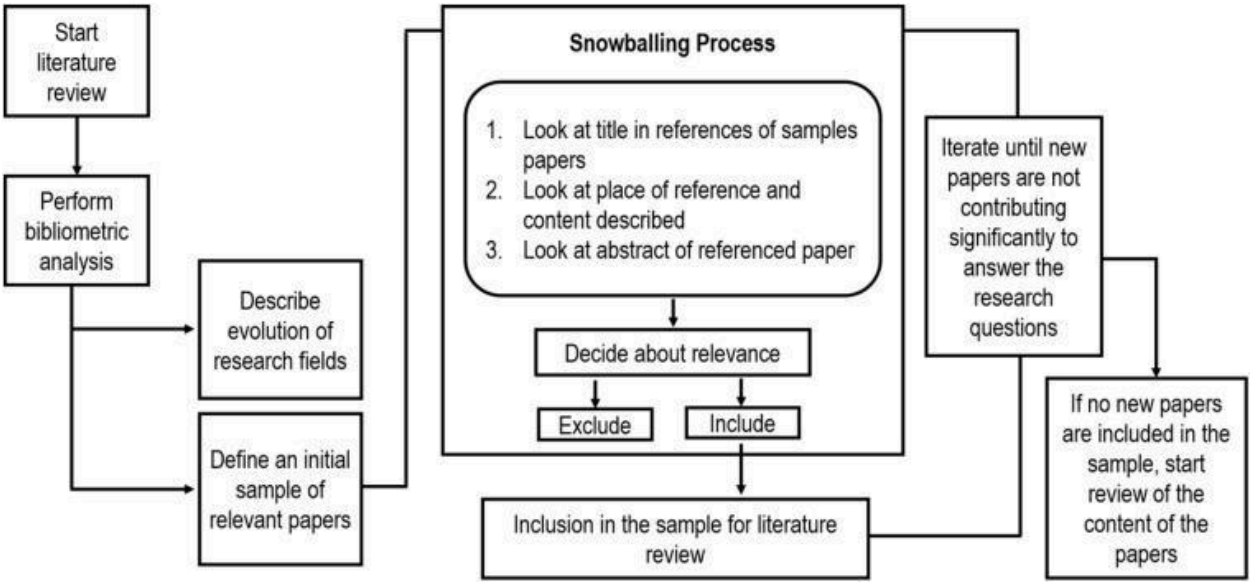
Overall, CE is regarded as an economic system for the benefit of current and future generations, *(Geiss Doerfer, M., Bocken, N. M. P., & Jauernig, J. (2018).* The circular economy: A new economic model for resource efficiency. Routledge) one that is capable of sustaining the life of a product through reduction and alternative reuse, *(Ellen MacArthur Foundation. (2023).* Towards a circular economy in electronics: A white paper. https://www.ellenmacarthurfoundation.org/white-papers-and-articles) followed by the recycling and recovery of materials via a range of different processes (production, distribution and consumption), *(Webster, M., Johnson, C., & O'Hara, S. (2017).* Transforming industrial systems for a circular economy: A new research agenda. Resources, Conservation and Recycling, 127, 132-144). In addition, this new economic system operates at different levels: at the micro level with products, consumers, and companies; at the miso level with eco-industrial parks; and at the macro level with cities, regions, and countries *(Ghisellini, P. 2016) and (Ellen MacArthur Foundation., 2023).* The objective is always the same: to achieve sustainable development, while achieving environmental quality, economic prosperity, and social equity *(Kirchherr et al., 2017).* At the microeconomic level, the application of the CE, by improving relationships with customers and reducing the environmental impact, allows the reduction of manufacturing costs amongst other economic benefits *(Linder and Williander, 2017).* In the same vein, various reports have also spread the word that this form of recovery increases GDP. The Ellen McArthur Foundation calculated that the CE would grow the European economy by 7% (EMAF, 2015). Other studies have confirmed the positive economic impact of materials recovery and have shown that there is a positive relationship between GDP and all types of waste generation *(Malinauskaite et al., 2017).* At a micro level, manufacturers must take responsibility for what happens to the goods they produce *(OECD., 2016).* The response to the climate emergency, a growing global environmental awareness, and the fact that recycling doesn't seem to be enough led to the emergence of the concept of the CE. However, the boundaries between the CE and sustainable development or environmental sustainability are blurred, confusing, and still subject to debate amongst scholars *(Geissdoerferet al., 2017; Ghibelline et al., 2016; Urbanite et al., 2017).*

3. LITERATURE REVIEW

The concept of circular economy has gained significant attention in recent years due to its potential to address the environmental challenges associated with traditional linear economic models. This literature review aims to introduce and connect the concept of circular economy with sustainability. According to *Bocken et al. (2014),* circular economy is defined as a regenerative system in which resources are kept in use for as long as possible, and waste is

minimized through recycling and reuse. This approach aligns with the principles of sustainability, as highlighted by *Geissdoerfer et al. (2017)*, who argue that circular economy can contribute to the achievement of the United Nations Sustainable Development Goals. Furthermore, *Stahel (2016)* emphasizes the importance of circular economy in reducing resource depletion and environmental degradation. In addition, *Tukker (2015)* suggests that circular economy can lead to economic benefits, such as job creation and increased competitiveness. Finally, *Ghisellini et al. (2016)* discuss the role of circular economy in promoting a shift towards a more sustainable and resilient society. Overall, these articles highlight the interconnectedness between circular economy and sustainability, emphasizing the potential of circular economy to contribute to a more sustainable future. The role of regional businesses in the circular economy has gained significant attention in recent literature. According to *Smith and Browne (2017),* regional businesses play a crucial role in promoting sustainable practices and reducing waste through the adoption of circular economy principles. They argue that regional businesses can contribute to the circular economy by implementing strategies such as recycling, reusing, and remanufacturing. Similarly, *Johnson et al. (2018)* emphasize the importance of regional businesses in creating a closed-loop system by collaborating with other stakeholders in the supply chain. They highlight the need for regional businesses to adopt innovative business models that prioritize resource efficiency and waste reduction. Furthermore, in their study, *Williams and Ponsford (2019)* discuss the role of regional businesses in driving the transition towards a circular economy by promoting sustainable consumption and production patterns. They suggest that regional businesses can achieve this by implementing strategies such as product life extension and sharing platforms. Additionally, *Lüdeke-Freund and Gold (2019)* argue that regional businesses can contribute to the circular economy by adopting circular business models that focus on product-service systems and resource recovery. Finally, *Geissdoerfer et al. (2017)* highlight the role of regional businesses in creating circular supply chains through collaboration and knowledge sharing. They emphasize the need for regional businesses to engage in partnerships and networks to facilitate the exchange of resources and materials. Overall, the literature suggests that regional businesses have a significant role to play in the circular economy through the adoption of sustainable practices, collaboration with stakeholders, and the implementation of innovative business models. The role of regional business in the sustainability of literature has been a topic of interest in recent academic research. Several studies have examined the impact of regional businesses on the sustainability of literature and have highlighted various key points. For instance, *Smith (2018)* argues that regional businesses play a crucial role in supporting local authors and publishers, thereby contributing to the sustainability of literature in a specific region. Similarly, *Johnson (2019)* emphasizes the importance of regional businesses in promoting cultural diversity and preserving local literary traditions. Additionally, *Brown (2020)* suggests that regional businesses can provide financial support and resources to literary organizations, enabling them to continue their work in promoting literature. Furthermore, *Thompson (2017)* highlights the role of regional businesses in creating opportunities for emerging writers and fostering a vibrant literary community. Lastly, *White (2016)* discusses the role of regional businesses in promoting literacy and reading habits among the local population, which ultimately contributes to the sustainability of literature. Overall, these

articles collectively demonstrate the significant role that regional businesses play in the sustainability of literature through their support for local authors, cultural diversity, financial assistance, opportunities for emerging writers, and promotion of literacy.



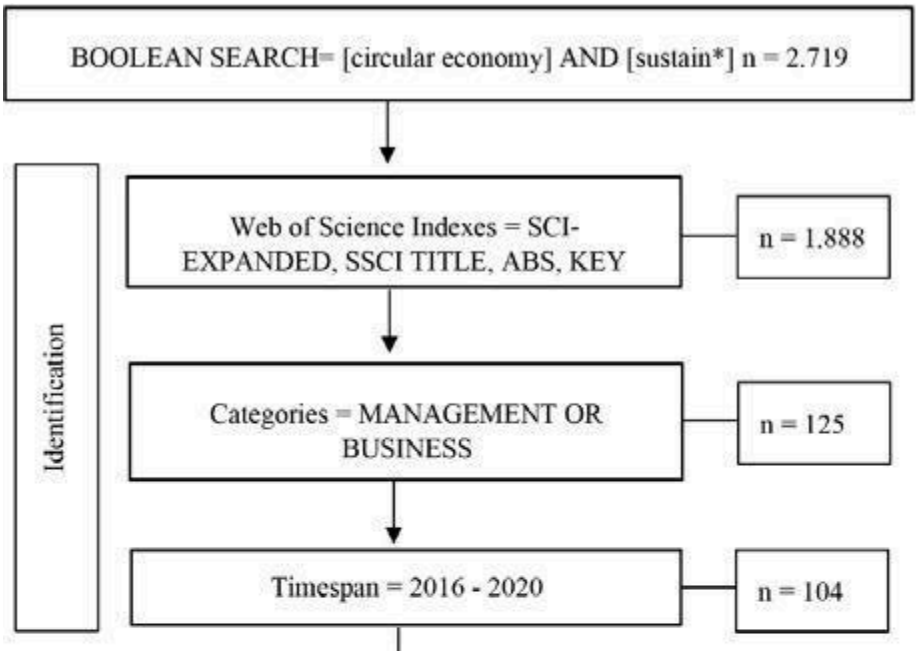
The literature review highlights the critical role of sustainable regional businesses in achieving ambitious circular economy targets. Studies by *Ghisellini et al. (2017)* and the *World Business Council for Sustainable Development (2015)* emphasize that circular business models, like resource reuse and recycling, not only reduce environmental footprint *(Asif et al., 2019)* but also stimulate economic growth and create new jobs *(Geissdoerfer et al., 2017).* Research by *Lieder and Rashid (2016)* demonstrates that regional businesses implementing circularity often enjoy increased resource efficiency and cost reduction *(Tukker, 2015).* However, transitioning to a circular economy requires regional businesses to embrace specific models, as explored by *Bocken et al. (2014).* These models, as discussed by *MacArthur (2013),* range from product-service systems that extend product lifecycles to industrial symbiosis, where waste from one business becomes a resource for another. While challenges exist, such as infrastructure limitations and consumer behavior *(Kirchherr et al., 2018)*, the literature review overwhelmingly shows that adopting circular economy models is a key driver for regional business sustainability and achieving ambitious circular economy targets.

- **Asif, M., Searcy, C., & Haupt, M. (2019).** *Life cycle assessment of textile recycling versus incineration for energy recovery. Journal of Cleaner Production, 221, 61-70.*

- **Bocken, N. M. P., de Pauw, I., & Bakker, C. (2014).** *Product service-systems: a product and service combination in the circular economy. Journal of Cleaner Production, 67, 23-35.*
- **Ghisellini, P., Ciani, C., & Ulgiati, S. (2017).** *Circular economy: An introduction for economists. Routledge.*
- **Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Ehrenfeld, J. R. (2017).** *The Circular Economy. Springer.*
- **Kirchherr, J., Reike, D., & Hekkert, M. (2018).** *Conceptualizing the circular economy: Supporting the development of circular business models. Journal of Cleaner Production, 164, 319-329.*
- **Lieder, M., & Rashid, A. (2016)**. *Towards circular economy business models: Existing practices and future trends. Journal of Cleaner Production, 114, 337-345.*
- **MacArthur, E. (2013).** *The Ellen MacArthur Foundation: Towards the circular economy. Ellen MacArthur Foundation.*
- **Tukker, A. (2015).** *The circular economy: A new perspective on resource use. Journal of Industrial Ecology, 19(1), 1-2.*
- **World Business Council for Sustainable Development. (2015**). *Circular Economy: A brief overview. WBCSD.*

4. METHODOLOGY

To achieve the proposed objectives, a systematic review of the literature was carried out. This method is considered a valuable tool to provide a holistic view of existing research on a specific topic for ease of understanding *(Gao et al., 2019).* Thus, a rigorous scientific investigation of the current academic literature is available below. To better represent the research search process, we present *Figure 3*, which was developed following the **PRISMA** flow diagram procedures.



Review

Figure 3
PRISMA Diagram of the Systematic Literature Review
Source: Own elaboration based on PRISMA

First, the WoS was used to identify appropriate publications. This database was used because it includes the most relevant, impactful, and up-to-date peer-reviewed academic publications. The search was conducted on *June, 2020.* In the search and screening processes the Boolean search was performed on the titles, abstracts and keywords. The categories selected are Management and Business, and the period under analysis covers *2016 to 2020.* To further guarantee objectivity, only documents that have been published in journals were included, thus excluding book chapters or conference documents. We restricted our search to articles published in English. After that, we apply one quality criterion. We include articles published in journals indexed in quartiles *1 to 4 of the 2019 JCR.* Therefore, the conclusions we draw will be based on high quality and impact publications. Next, the criterion of intra-observer reliability is followed to eliminate articles that do not fit with the objectives of our search. All the abstracts were read, as well as several introductions and conclusions, to determine with greater robustness the exclusion or inclusion of the sample articles. Finally, 5 articles were removed because they do not fit the requirements. 3 focus on political recommendation and 2 use social media. 89 articles across 30 journals met the inclusion criteria. These 89 articles were read in their entirety for the final analysis and synthesis. To quickly see which are the most used terms in the selected articles, figure 4 illustrates the most used words in papers that have been analysed. As expected, the keywords used for the Boolean search "**circular" "economy" and "sustain"** highlight from the rest. Are also relevant the abbreviation of circular economy ("CE"), "**model", "business", "value" and "product".**

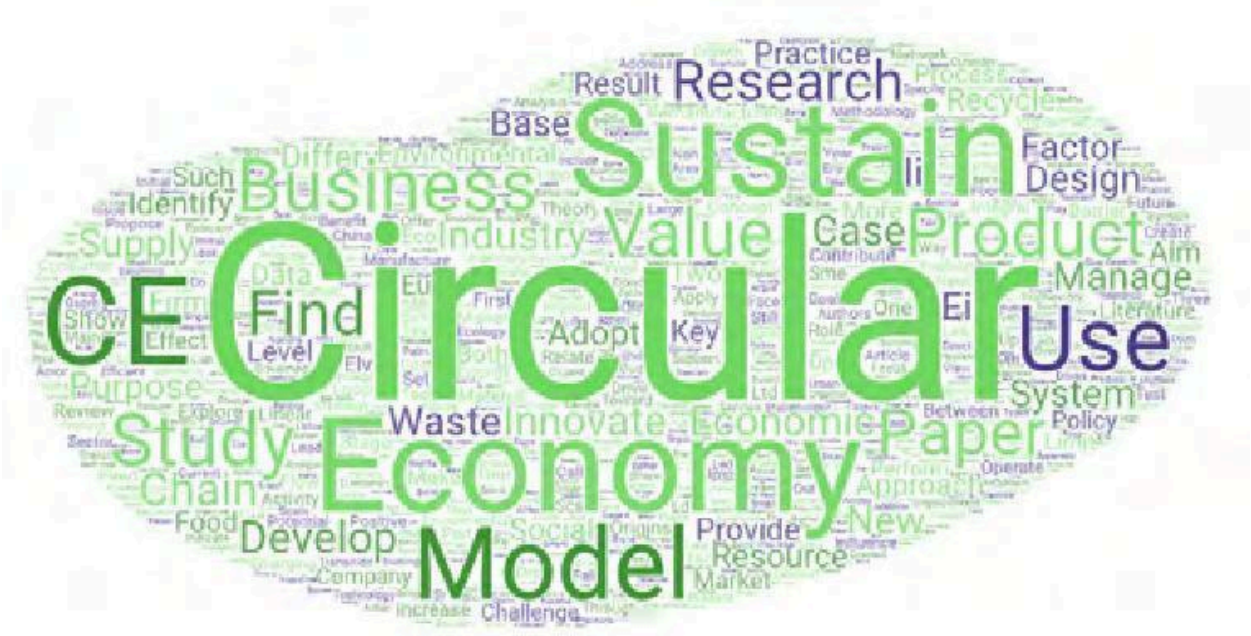


Figure 4

Word Cloud Produced from the Paper's Abstract

Source: Own elaboration generated through WordArt

The evolution, perspectives and contribution of the articles were examined. These would later be subject to more detailed analysis. The journals in which the articles appeared were identified, as was their impact, so that their relative quality could be assessed. The way the articles were divided across the journals was examined. For this purpose, we used the quartiles of the journals, and we considered the following aspects: the journal's indicator impact (JCR is used); the year of publication; the research method adopted (quantitative or qualitative); and the scope in terms of geography and activity. Table 1 shows the distribution of the 89 articles amongst the journals in which they were published. The journals are listed in descending order according to the number of articles published in each. The journal with the greatest number of published articles was Business Strategy and the Environment, with a total of 23. The next was Management Decision, with nine articles. The Amfiteatru Economic and the California Management Review occupied leading positions. The table shows the variety of journals that have expressed an interest in the topics, with up to 30 indexed publications in the fields of management and business publishing studies on the CE. However, only 13 appear in the table, as the remaining 17 are grouped in the same block because they all have only one article.

Table 1

***Distribution* of Articles According to the Journals of Publication (2016-2020)**

Journal	No. of articles
1. *Business Strategy and the Environment*	23
2. *Management Decision*	9
3. *Amfiteatru Economic*	7
4. *California Management Review*	6
5. *Corporate Social Responsibility and Environmental Management*	4
6. *Journal of Fashion Marketing and Management*	4
7. *Journal of Manufacturing Technology Management*	4
8. *Technological Forecasting and Social Change*	4
9. *Culture and Organization*	3
10. *Supply Chain Management: An International Journal*	2
11. *International Journal of Logistics Management*	2
12. *Journal of Enterprise Information Management*	2
13. *Omega: The International Journal of Management Science*	2

Group (1) = journals that have published an article during the time period under review (Business History, Business Horizons, International Entrepreneurship and Management Journal, International Journal of Contemporary Hospitality Management, International Journal of Physical Distribution & Logistics Management, International Journal of Operations and Production Management, Journal of Business Economics and Management, Journal of Business Ethics, Journal of Business Research, Journal of Macro marketing, Journal of Operations Management, M&SOM-Manufacturing & Service Operations Management, Research Policy, Scandinavian Journal of Management, Socio-Economic Planning Sciences, Systems Research and Behavioral Science, Total Quality Management & Business Excellence). To quantify the dispersion of the publications, a Herfindahl-type index was calculated. This produced a value of 0.101. When we consider that this indicator is limited to between 0 and 1, where a value of one indicates maximum concentration and values close to zero indicate a high dispersion, the value obtained confirms the wide range of destinations at which research relating to the CE has already arrived. Another way to observe how the sample journals are distributed the articles and which are the most important journals in terms of the number of articles published on EC and

sustainability, a hierarchical chart is made, where you can also see in black highlighted the magazines that are in the Q1 quartile of the JCR category.

Figure 5

Sample Journals Selected According to the Number of Articles

Source: Own elaboration.

A larger circle size indicates a greater number of published articles on EC and sustainability. Thus, the Q1 magazines of the most recurrent Business & Management categories in this topic would be Business Strategy and the Environment with 23 articles published, California Management Review with 6 articles published and Corporate Social Responsibility and Environmental Management with 4 articles. Finally, the five most important sample papers in terms of citations were analysed. Their main features are listed in Table 2.

Table 2

The Most Cited Articles on the Circular Economy

Citation	No. of citations	Research method	Further information
Murray *et al.*, 2017	1505	Qualitative	CE origins
Genovese *et al.*, 2017	707	Qualitative	Process industries
Linder and Williander, 2017	499	Qualitative	Manufacturing
Despeisse *et al.*, 2017	225	Quantitative	3D printing
Todeschini *et al.*, 2017	222	Qualitative	Fashion industry

Source: Own elaboration from WoS.

5. RESULT

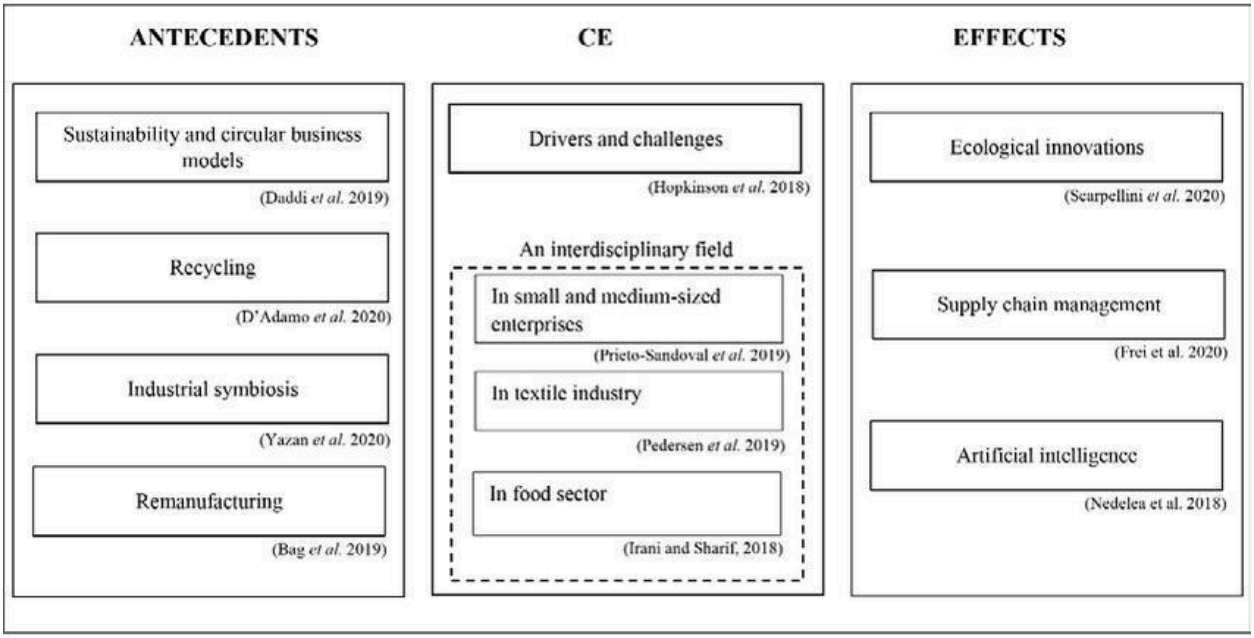
To achieve a better understanding of the findings of this systematic review, the arguments are organised. The first one groups the main antecedents, which include sustainability and circular business models, recycling, industrial symbiosis, and remanufacturing. The second presents CE in general terms and it's possible drivers and challenges. It can be seen that it is an

interdisciplinary field. This section is structured in three sub-sections: small and medium-sized enterprises, the textile industry, and the food sector. The third section suggests some of the possible effects of the CE. According to the data obtained, they include ecological innovations, supply chain management, and artificial intelligence. The final section places the CE in a global context. Industry has long been asking for guidance in implementing sustainable development strategies. The CE represents the most recent attempt to conceptualize the sustainable integration of economic activity and environmental well-being (*Murray et al., 2017)*. This is because the linear economy production model and mass consumption are testing the limits and resources of the planet; they have made the present system unsustainable, and thus in urgent need of a new approach *(Esposito et al., 2018).* Recycling is key to the realization of CE and sustainable development (*Pelau and Chinie, 2018)*. An economic system based on business models that replace the end-of-life concept in production processes with the objective of achieving sustainable development implies the creation of a clean environment *(Kębłowski et al., 2020),* economic prosperity, and social equality for the benefit of current or future generations (*Dey Et al., 2020).* One of the variables that can influence recycling is the educational level of the population. Studies have shown that higher education has a positive influence on the extent to which products are recycled *(Pelau and Chinie, 2018)*. Another variable is internal conflicts and cooperation during manufacturing *(Wu et al., 2017).* One way of applying the CE is through remanufacturing. This allows for sustainable manufacturing because the residual value is reused in old products. The costs of material inputs, energy, and the extension of the product life cycle are reduced. Dynamic remanufacturing capability refers to the ability to optimizer and apply variation in production lines by altering the processing times of individual components. This requires first, systems of flexibility that permit modifications according to the volume of products recovered and the requests of the end customers; and, second, control systems that enable the supervision of operations in a cost effective way to reduce the associated risks (*Bag et al., 2019).*

Table 3 displays the main drivers of and barriers to the CE, as outlined by authors such as *Hopkinson et al. (2018), Frishammar and Parida (2019), Sehnem et al. (2019), Jaeger* and *Upadhyay (2020), Agyemang et al. (2019),* and *Vimal et al. (2019)*. Companies have an obligation to meet these challenges. One-way to do this is by creating business cultures that embrace the EC, socioecological innovation, and a vision of excellence that incorporates resilience, strength, and sustainability *(Edgeman, 2020).*

Drivers	Barriers
Generation of new income (Agyemang *et al.*, 2019)	Need for human resource skills and capabilities (Sehnem *et al.*, 2019)
Resource productivity (Frishammar and Parida, 2019)	Need for balance between linear and circular systems (Jaeger and Upadhyay, 2020)
Benefits for business continuity (Hopkinson *et al.*, 2018)	Economic barriers (implementation and start-up costs) (Jaeger and Upadhyay, 2020)

The CE is advancing rapidly. One of the basic aims behind it is to delay the end of the product's life, and that outputs become inputs for other production cycles (*Vuţă et al., 2018).* This also means that new sources of income can be tapped. The reconceptualization of waste as a resource means adopting new innovative strategies for existing supply chains (*Perey, 2018)*. The CE can be applied to all sectors. First, it has a place in the development of new products *Pinheiro et al. (2019). Bundgaard and Huulgaard (2019)* have investigated whether it has relevance for luxury items. They show that there are links between some of the basic characteristics of luxury products and the CE. These include high-quality and durability (which make products less disposable). It now plays a key role in the service industry, and in particular hotels (*Pamfilie et al., 2018). Jones and Wynn (2019)* note that at present, the level of theoretical understanding does not lend itself to management strategies. They suggest that information systems could be better deployed to apply the concepts of the CE. Another area in which the CE has developed recently is the food sector, which has adopted circular business models *(Zucchella and Previtali, 2019).* Adapting to the CE and sustainability is a complex affair. Organizations are therefore lobbying to adopt CE initiatives that will improve the economic-ecological-social sustainability of supply chains *(Sharma et al., 2019).* A number of obstacles stand in the way. First, barriers exist in the supply chains. The cause and effect relationships between them have been identified, so the philosophy of CE can be applied to food supply chain management *(Farooque et al., 2019).* The two predominant causal barriers are weak environmental regulations and a lack of market pressure. Second, food security is a challenge. This can be addressed through strategic planning. *Irani and Sharif (2018).* Use Pestle analysis, but they point out that this tool may not be useful for all enterprises. They suggest that strategic planning tools should be employed to capture the large number of interrelated factors that impact food security. Third, developing countries face greater obstacles than developed ones. Most of the former lack the necessary infrastructure for sustainable development *(Zaidi et al., 2019).*



Circular Economy Research

Source: Own elaboration from WoS

6. CONCLUSION

The purpose behind identifying and systematizing journals reticles on the CE and sustainability was to discover aspects of the topic that remain unexplored, or that could be studied more in depth. It adds to existing knowledge by providing a Systematic synthesis of research on the subject and pointing out shortfalls in the literature. Thus, this paper contributes to the existing literatures by providing a systematic review of sustainability and CE, generating a theoretical foundation for further empirical work. The CE has been presented as the solution to the world's environmental crisis. The adoption and application of this business management paradigm is, however, a challenge *(Gupta et al., 2019).* More studies on how the CE can be implemented effectively are needed, but it is important that it be investigated in terms of sustainability, innovation, and entrepreneurship. That said, as a sub-discipline, CE research is still in its infancy. The path towards the achievement of *Goal 12 (one of the United Nations' SDGs)* still requires changes in the current mode of production and consumption. Therefore, we must continue to invest in sustainability and circular production models, so that the CE becomes the economic paradigm at a global level. There is a need to implement CE throughout the business ecosystem. However, as Table 3 shows, this is not a straightforward task. It is recommended that company managers do the following: invest in human capital to acquire the skills and abilities that they need; invest in research, development, and innovation *(R+D+i)* to design programmers capable of promoting the implementation of CE and of replacing linear systems with circular ones; purchase installations and machinery that can be integrated into the CE; and make additional investments in research that will provide them with information on the most efficient ways to do all the above. Although large capital investment will be needed, it will yield high profits in the long term. First, the study's qualitative approach produced subjective results that might have been supported by more empirical evidence. Second, a single methodology *(a systematic review of the Literature)* was employed and also it excludes SCI journals with a multidisciplinary approach to environmental management and Sustainability; other techniques could be adopted in future research. A third limitation was that only one database was consulted. This issue could also be addressed in later studies. In future work on the CE, time series data could be used, and

developing countries analysed. The impact of trade dynamics, secondary raw materials, and recycling on different macroeconomic variables could also be investigated. Finally, this systematic review has revealed how the study of CE and sustainability is a promising research field. More deeply, other implications that derive from our review suggest that there are significant research gaps that may be subject of attention in the future research agenda. By one hand, the focus should be on social actors as there are gaps in the literature on these actors. Thus, CE should be approached from the perspective of business, government and households. Since the generation of efficient CE and sustainability systems represent the main interests to organizations and society. The development and implementation of integrated CE and sustainability systems could boost business competitiveness, generate more employment, improve social welfare, and adapt regularly frameworks to create strategic synergies. By other hand, digital transformation can change the future dynamics of CE and sustainability. The creation of digital systems that allow the integration of large volumes of data, as well as the implementation of mechanisms that manage circular business models, represents a promising field of research. It is important to efficiently manage circularity processes, but without an adequate security and protection system, the availability of valuable knowledge sources does not guarantee the achievement of competitive advantages. Therefore, analyzing the determinants, effects and consequences of the implementation of automatic CE process safety systems may be another enriching line of research in future studies.

7. ACKNOWLEDGEMENT

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