A Systematic Literature Review on the Circular Economy and Sustainability

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Received: June, 2023; Accepted: June, 2023; Published: August, 2023

Abstract

This study focuses on the significant shift from a linear to a circular economy, a topic that has recently gained traction in both business and academic sectors. Despite being a relatively new concept, the circular economy and its associated business models are garnering increased attention, necessitating the development of tools to aid their implementation. The aim of this study is to systematically explore the growing research interest in the circular economy and sustainability. The study employs a qualitative approach, conducting a comprehensive review of literature across various domains where the circular economy is applicable. These include sustainability, consumer behavior, innovation, remanufacturing, operations management, supply chains, intellectual capital, 3D printing, big data, and recycling. The study also delves into its relationship with small to medium-sized enterprises, and its impact on specific sectors like textiles and food. The goal is to pave the way for a sustainable solution that challenges the current linear model of production and resource management. Despite its novelty, the circular economy holds the promise of fostering positive synergies across economic, social, and environmental spheres.

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

INTRODUCTION

The necessity for a circular economy (CE) is underscored by the growing global population and the production of consumer goods that are quickly discarded, likely due to rapid technological advancements. These factors are causing serious environmental damage (Allwood et al., 2011). We are currently grappling with severe ecological issues such as climate change, pollution, deforestation, soil degradation, species extinction, and loss of biodiversity. Urgent measures are needed to promote sustainable use of natural resources and waste recycling, with the CE playing a crucial role in this endeavor.

This context underscores the need to address a significant research gap. The development of a comprehensive theoretical CE framework could contribute to the

United Nations Sustainable Development Goals (SDGs) for 2030. Concurrently, the CE promotes competitiveness and innovation, leading to favorable corporate financial returns and further economic development (United Nations, 2015). This study acknowledges the importance of SDG number 12 — "responsible production and consumption" — which aims for both economic growth and sustainable development. A drastic shift in our current production and consumption patterns is required.

The objective of this study is to systematically present the specific academic topic of the CE and sustainability for more in-depth exploration. The study offers a broad overview of the subject and outlines a roadmap for future research.

The study is structured as follows: Section 2 provides background information on the CE and defines the concept. Section 3 outlines the study methodology, including the selection and analysis of the sample. The results are discussed in Section 4, where the CE is examined in relation to several dimensions that have gained significant attention in the literature. Section 5 presents the key conclusions and contributions of the study, as well as its limitations, future research directions, and managerial implications.

THE CIRCULAR ECONOMY

Background to the Circular Economy

With the anticipated population growth, the demand for raw materials is expected to double in the next forty years (EC, 2018). Energy demand will also rise, as there is a positive correlation between increased wealth and energy consumption (Malinauskaite et al., 2017). We are facing challenges such as increased carbon dioxide emissions, plastic pollution in the oceans, and rising sea levels. Consequently, the term "climate refugees" has been coined to refer to individuals who will be forced to relocate due to climate change (Ahmed, 2018).

Years ago, recycling measures were implemented to mitigate the climate crisis. In the European Union, the municipal waste recycling rate increased from 27.3% in 2000 to 47.7% in 2019 (EC, 2021). However, these measures appear to be insufficient, as most waste is non-recyclable (Kirchherr et al., 2017). Moreover, the exponential increase in consumption has escalated the ecological footprint annually (EMAF, 2015). Therefore, it is imperative that we adopt a sustainable lifestyle and transition from a linear economy to the CE. Manufacturers must be held accountable for the lifecycle of their products. The response to the climate crisis, heightened global environmental consciousness, and the insufficiency of recycling led to the emergence of the CE concept. However, the distinctions between the CE, sustainable development, and environmental sustainability are vague, confusing, and still a subject of scholarly debate (Geissdoerfer et al., 2017; Ghisellini et al., 2016; Urbinati et al., 2017).

The Influence of Sustainable Development Goals on the Circular Economy

In light of the aforementioned issues, the United Nations set forth 17 Sustainable Development Goals (SDGs) in 2015, with a target completion date of 2030. While each goal focuses on distinct areas, they all share a common theme: the adoption of the circular economy as a sustainable alternative to the linear model of resource production and management, which has led to adverse economic, environmental, and social impacts.

These measures were proposed due to the potential benefits of transitioning to a sustainability-focused circular economy. Achieving climate goals, preserving environmental resources, creating more wealth, and generating competitive advantages could all be possible outcomes of this transition.

However, even if material recovery is globally recognized as a goal, several institutional and financial hurdles need to be addressed (Pajunen and Heiskanen, 2012). For example, businesses will have to align their business models with the principles of an effective circular economy (Centobelli et al., 2020).

Research on the Circular Economy and Waste Management

The circular economy is currently a trending subject among scholars and industry professionals. This is evidenced by the rapid growth in publications on the topic in high-impact journals (Kirchherr et al., 2017)

A significant increase in the number of articles addressing the circular economy (CE) on the Web of Science (WoS) from 2014 to 2019. In 2004, there were 93 articles published on the topic, and by 2019, this number had grown eighteen-fold to nearly 1700. This upward trend appears to be continuing into 2021, based on the available data.

In an extensive analysis of 114 definitions of the CE, Kirchherr et al. (2017) found that the concept is interpreted differently by various authors. Generally, the CE is viewed as an economic system designed to benefit present and future generations by extending the lifespan of a product through reduction, alternative reuse, and recycling and recovery of materials through various processes (production, distribution, and consumption). This novel economic system operates on multiple scales: the micro level (products, consumers, and companies), the meso level (eco-industrial parks), and the macro level (cities, regions, and countries). The goal remains consistent across all levels: to achieve sustainable development while maintaining environmental quality, economic prosperity, and social equity (Kirchherr et al., 2017).

Lastly, closely tied to CE research, waste management has emerged as a recurring theme among scholars. The most sustainable action is reducing material use, followed by reuse, recycling, recovery, and finally, as a last resort, landfill (EC, 2016). This framework is endorsed by the

European Union, numerous national governments, and many global companies (Korhonen et al., 2018). It was introduced to address the environmental degradation and resource scarcity caused by economic development, after a prolonged period when industries needed guidance to implement sustainable development strategies (Murray et al., 2017).

The Economic Impact of the Circular Economy

At the microeconomic level, the implementation of the circular economy can lead to various economic benefits, such as reducing manufacturing costs and improving customer relationships, by minimizing environmental impact (Linder and Williander, 2017). Similarly, several reports have highlighted that this recovery method boosts GDP. The Ellen McArthur Foundation estimated that the circular economy could increase Europe's economy by 7% (EMAF, 2015). Other studies have affirmed the positive economic impact of material recovery and demonstrated a positive correlation between GDP and all forms of waste generation (Malinauskaite et al., 2017).

METHOD

To meet the stated objectives, a systematic literature review was conducted. This method is recognized as a valuable tool for providing a comprehensive overview of existing research on a specific topic, making it easier to understand (Gao et al., 2019). Consequently, a thorough scientific examination of the current academic literature is presented below.

Selection, Screening, and Eligibility of Sample

Initially, the Web of Science (WoS) was utilized to identify suitable publications. This database was chosen due to its inclusion of the most relevant, impactful, and current peer-reviewed academic publications. The search was conducted in January 2022.

During the search and screening processes, a Boolean search was performed on the titles, abstracts, and keywords. The selected categories were Management and Business, and the analysis period spanned from 2016 to 2020. To ensure objectivity, only documents published in journals were included, thereby excluding book chapters or conference documents. The search was limited to articles published in English. Subsequently, we applied a quality criterion, including only articles published in journals indexed in quartiles 1 to 4 of the 2019 JCR. As a result, our conclusions will be based on high-quality and impactful publications.

Next, the intra-observer reliability criterion was followed to exclude articles that did not align with our search objectives. All abstracts, as well as several introductions and conclusions, were read to more accurately determine the exclusion or inclusion of sample articles. Ultimately, 5 articles were removed because they did not meet the requirements: 3

focused on political recommendations, and 2 used social media. A total of 89 articles from 30 journals met the inclusion criteria. These 89 articles were thoroughly read for the final analysis and synthesis. As anticipated, the keywords used for the Boolean search — "circular," "economy," and "sustain" — stand out. Other notable terms include the abbreviation for circular economy ("CE"), "model," "business," "value," and "product."

Description of the Sample

The progression, viewpoints, and contributions of the articles were evaluated, with a more detailed analysis to follow. The journals in which the articles were published and their impact were identified to assess their relative quality. The distribution of articles across the journals was also examined. For this, we used the quartiles of the journals and considered factors such as the journal's impact indicator (using JCR), the year of publication, the research method employed (quantitative or qualitative), and the scope in terms of geography and activity.

Table 1 displays the distribution of the 89 articles among the journals in which they were published. The journals are arranged in descending order based on the number of articles each published. The journal with the most published articles was Business Strategy and the Environment, with a total of 23. This was followed by Management Decision, with nine articles. Amfiteatru Economic and California Management Review also held prominent positions. The table demonstrates the range of journals that have shown interest in the topics, with as many as 30 indexed publications in the fields of management and business publishing studies on the circular economy. However, only 13 are shown in the table, as the remaining 17 are grouped together, each having published only one article.

Table 1
Distribution of articles according to the journal 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)	

Source : Interpretation from WoS

Group (1) includes journals that have published an article during the review period (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 Macromarketing, 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 measure the dispersion of the publications, a Herfindahl-type index was calculated, resulting in a value of 0.101. Given that this indicator ranges between 0 and 1, where a value of one signifies maximum concentration and values close to zero indicate high dispersion, the obtained value confirms the broad array of outlets that research related to the circular economy has reached.

The percentage of selected articles from JCR categories, determined by the journal's publication quartile. 53.93% were situated in Q1. Qualitative methods were implemented in a majority of the studies, accounting for 80.89%. Quantitative studies constituted a smaller portion of the total sample, 16.85%, indicating room for growth. Mixed method approaches were also underrepresented.

In terms of continental data aggregation, nearly half of the research is based on data from Europe (42.69%), closely followed by international studies (41.57%). Asia (12.36%) is next, trailed by America (2.24%) and Africa (1.12%). On a country level, the most studies (35.96%) utilized samples from China (5.62%), placing first. Sweden and Romania (4.49%) shared the second spot, while the United Kingdom, Spain, and India (3.37%) ranked third. Lastly, the five most cited papers from the sample were examined. Their primary characteristics can be found 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 : Interpretation from WoS

RESULTS

For clarity, the outcomes of this systematic review are compartmentalized into sections as shown in Figure 2. The first section groups key precursors such as sustainability and circular business models, recycling, industrial symbiosis, and remanufacturing. The second section introduces the Circular Economy (CE) broadly. CE proves to be an interdisciplinary domain, and this section further branches out into three sub-sections: small and medium enterprises, the textile industry, and the food sector. The third segment proposes potential effects of CE like ecological innovations, supply chain management, and artificial intelligence. The final section situates CE in a worldwide setting.

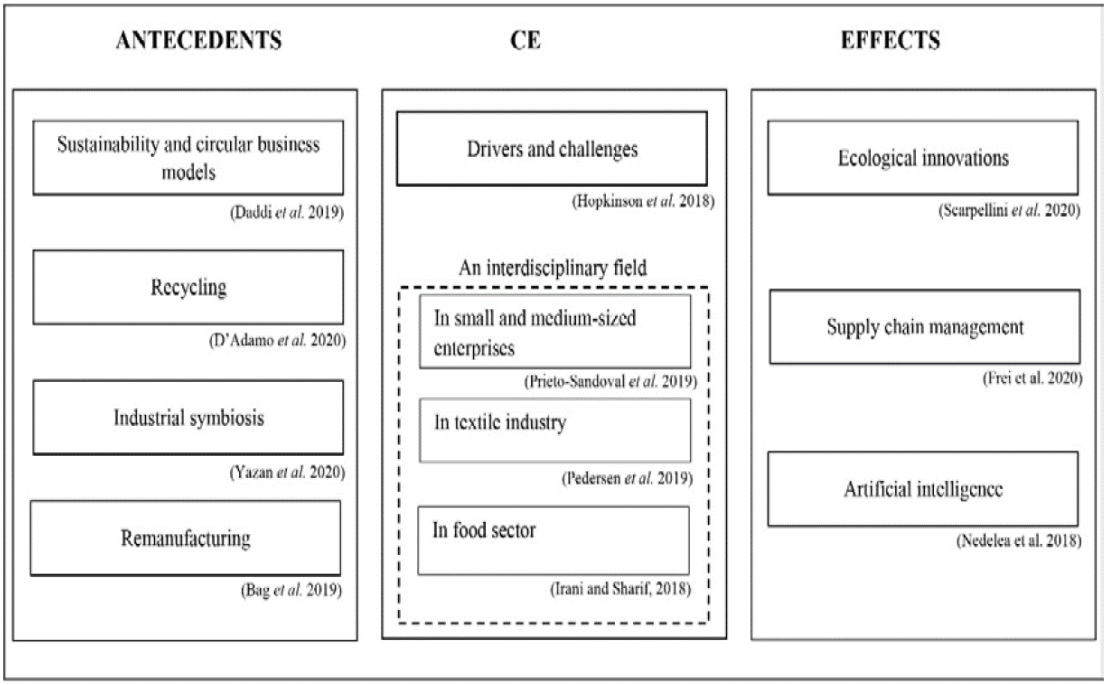

Figure 2
Circular economy research
Source : Interpretation from WoS

Antecedents

SUSTAINABILITY AND CIRCULAR BUSINESS MODELS

The industrial sector has consistently sought counsel on executing sustainable development strategies. The CE is the most recent framework to merge economic activities and environmental well-being sustainably (Murray et al., 2017). The linear economic model and extensive consumption strain the earth's resources and capacities, marking the current

system as unsustainable and requiring an innovative approach (Esposito et al., 2018).

Business sectors exhibit significant interest in sustainability, indicated by over 13,000 companies from 160 countries signing the United Nations Global Compact (Lozano, 2020). CE is progressively viewed as a method for organizations and national economies to attain environmental sustainability (Brown and Bajada, 2018). CE, inseparable from sustainability (Dubey et al., 2019), relies heavily on environmental protection policies for future growth (Cainelli et al., 2020). CE revolutionizes the conventional approach, emphasizing product transformation to reconcile ecological systems and economic expansion. It is not merely about limiting environmental exploitation but also developing self-perpetuating production systems for continuous material reuse (Genovese et al., 2017).

In particular, industrial sustainability promotes a generative, restorative, and positive economy (Smart et al., 2017). Circular business models are attracting growing interest in both academia and the business world (Chen et al., 2020). Therefore, profitability metrics for implementing these models are being developed. Ionascu and Ionascu (2018) assert that adopting a sustainable business model boosts company performance without economic detriment. To gauge an industry's sustainability level, sustainability reports are widely employed, recently being adopted in air transport (Karagiannis et al., 2019)

At times, sustainability initiatives can lead to unintended environmental implications (Laurenti et al., 2016). This can be attributed to the company's own ecosystem. The intricate and interconnected nature of businesses implies that no solitary firm can transition to a Circular Economy (CE) independently; it necessitates a complete ecosystem adjustment (Parida et al., 2019). Companies often encounter a paradoxical tension when promoting sustainability - a risk stemming from environmental-friendly actions that may compromise quality and competitiveness. Defensive and proactive strategies are necessary to navigate these scenarios (Daddi et al., 2019).

RECYCLING: THE BEDROCK OF THE CIRCULAR ECONOMY

Recycling plays a vital role in actualizing CE and sustainable development (Pelau and Chinie, 2018). An economic system that utilizes business models to supersede the end-of-life notion in production processes, with a goal to attain sustainable development, invariably fosters a cleaner environment (Kębłowski et al., 2020), economic prosperity, and social equality for the advantage of current and future generations (Dey et al., 2020). Variables that can influence recycling include the population's educational level and internal conflicts and cooperation during production (Wu et al., 2017).

D'Adamo et al. (2020) investigated the potential correlation between end-of-life vehicle flows and GDP and population variables. Their findings revealed a rise in GDP correlated with an increased number of recycled vehicles after their lifespan, demonstrating a synergy between CE and technology (D'Adamo et al., 2020).

Incorporating Industry 4.0's emerging technologies into recycling and CE practices can help create a business model that repurposes and recycles waste material, such as electronic waste. This integration can boost business sustainability when waste is reincorporated into the supply chain for product manufacturing (Nascimento et al., 2019). However, recycling should be seen as complementary to CE, with renewable energy usage being equally vital for a sustainable and healthy ecosystem (Andronie et al., 2019).

INDUSTRIAL SYMBIOSIS: THE NEED FOR COLLABORATION OVER COMPETITION

Every company strategically aims to achieve sustainable and enduring competitive advantage, which is why CE is often included as part of their competitiveness strategy.

Recent research by Yazan et al. (2020) and Sehnem (2019) explores the benefits and impacts of CE, introducing novel concepts like industrial symbiosis. Such symbiosis is critical for companies aiming to implement CE systems cooperatively rather than competitively. However, fostering cooperation between companies is not straightforward. To tackle competition-induced issues, Yazan et al. (2020) propose a non-cooperative game theoretical model to share additional costs, encompassing two strategies - fair and opportunistic. The latter provides short-term benefits, while the former is more suitable for long-term gains (Yazan et al., 2020).

REMANUFACTURING AS A MEANS TO IMPLEMENT THE CIRCULAR ECONOMY

Remanufacturing is a practical way to apply the CE, facilitating sustainable manufacturing by reusing the residual value in old products. This approach reduces the costs of materials, energy, and prolongs the product life cycle. Dynamic remanufacturing capability involves the capacity to optimize and apply variation in production lines by changing the processing times of individual components. This necessitates flexible systems for alterations according to the volume of recovered products and customer demands, and control systems to supervise operations cost-effectively, mitigating associated risks (Bag et al., 2019).

Remanufacturing's contributions to sustainable development and the CE are underscored by Shao et al. (2019). Yet, a company's decision to adopt this strategy often involves uncertainty, especially when it requires substantial capital investment (Low and Ng, 2018).

The Circular Economy

The Circular Economy: A Multidisciplinary Domain

The CE is evolving quickly, with one of its fundamental goals being to extend the product's lifespan, transforming waste into valuable inputs for subsequent production cycles (Vuţă et al., 2018). This allows for the discovery of new revenue streams and involves reimagining waste as a resource, calling for innovative strategies within current supply chains (Perey, 2018).

The CE is applicable to all sectors. Firstly, it can be used in the creation of new products (Pinheiro et al., 2019). Bundgaard and Huulgaard (2019) explored its relevance for luxury items, finding connections between certain qualities of luxury products and the CE, such as their high quality and durability, which make them less likely to be discarded.

In the service industry, especially hotels, the CE now plays a crucial role (Pamfilie et al., 2018). Jones and Wynn (2019) point out that the current level of theoretical knowledge does not readily translate into management strategies. They suggest the use of information systems could be improved to implement CE concepts. Furthermore, 3D printing presents a significant opportunity for establishing local recycling and manufacturing cycles, as well as promoting eco-friendly manufacturing (Unruh, 2018). It facilitates product life extension designs (Kunz et al., 2018) leveraging economies of scope rather than of scale (Despeisse et al., 2017). However, apart from the usual challenges related to the CE implementation, the low quality of products in the sector demands additional technological innovation.

IN SMALL AND MEDIUM-SIZED ENTERPRISES (SMES)

SMEs make up 90% of businesses worldwide, contributing to 60-70% of employment and over 70% of industrial pollution. This positions them as vital players in adopting the CE concept (Prieto-Sandoval et al., 2019).

In recent years, the CE has gained importance as it offers a sustainable pathway for value creation (Prieto-Sandoval et al., 2018). Nonetheless, there's a lack of research tying CE practices to sustainability performance in SMEs (Dey et al., 2020).

Achieving sustainability in SMEs is essential to address social and environmental issues and to maintain a competitive edge (Ünal 2019). Prieto-Sandoval et al. (2018) pinpoint the elements that help SMEs evaluate their current standing and what they need to do

to enhance their performance within the CE: CE action fields, industrial symbiosis, and environmental certification.

However, SMEs encounter several obstacles when trying to enact CE strategies (García-Quevedo, 2020). The unique characteristics of the four types of SMEs should be considered when implementing CE practices (Bassi and Dias, 2020). Bassi and Dias (2020) categorize them as: companies uninterested in CE, not adopting or planning to adopt CE practices; companies in the process of embracing CE; companies interested only in specific CE practices; and companies with a strong inclination towards the green economy that already implement the analysed CE practices.

A groundbreaking study by Katz-Gerro and López Sintas (2019) shifted the traditional perspective on the CE. They propose that CE activities are distinct from each other. They rank the activities most likely to be carried out by SMEs in order of probability: waste minimization; energy use replanning; product redesign; and use of renewable energy along with water use replanning.

IN THE TEXTILE INDUSTRY

New recycling technologies within the textile sector have the capacity to reroute material resource flows, affect global secondary markets, and reshape the waste hierarchy (Norris, 2019). Customers can significantly impact the adoption of the CE, as their approval contributes to a company's social legitimacy. This stems from a shift in their mindset, as they are increasingly prioritizing practices that are socially and environmentally responsible (Barbu et al., 2018). Businesses must be aware and adapt to these evolving consumer behavior trends (Horvath et al., 2019).

In this context, we can refer to ecological consciousness. Companies can guide their customers' purchasing behaviors, given that customers are often willing to pay a premium for sustainable products (Pal, 2019), (Unterfrauner et al., 2019). Consumers demand visible proof, such as eco-friendly labels on packaging, of the manufacturers' commitment to sustainability (Vehmas et al., 2018).

The textile sector, being one of the world's most polluting industries (Vehmas et al., 2018), demands particular scrutiny. The explosive increase in clothing ending up in landfills poses a significant challenge for the CE (Hvass and Pedersen, 2019). This is an outcome of the fast-fashion phenomenon – the rapid production and disposal of clothes, leading to the perception of clothing as throwaway items (Todeschini et al., 2017).

To address this issue, we need sustainable fashion that fosters circular material flows (Corvellec et al., 2020). This necessitates consumer cooperation in promoting slow fashion, prioritizing quality over quantity, and treating garments as investments (Vehmas et al., 2018). Effective garment collection systems and sorting methods are also required (Pedersen et al., 2019). In summary, implementing the CE in fashion requires business model innovation, organizational change, value proposition transformation, establishing new partnerships with stakeholders, and customer engagement.

IN THE FOOD SECTOR

Another sector where the CE has gained traction recently is the food industry, which has embraced circular business models (Zucchella and Previtali, 2019). Transitioning to the CE and sustainability is intricate. As such, organizations are advocating for CE initiatives to enhance the tripartite sustainability of supply chains – economic, ecological, and social (Sharma et al., 2019). This path, however, has several obstacles.

First, there are impediments within the supply chains. The cause and effect relationships among them have been pinpointed, allowing the CE philosophy to be applied to food supply chain management (Farooque et al., 2019). The two principal causal barriers are feeble environmental regulations and a lack of market pressure.

Second, food security presents a challenge. This can be tackled through strategic planning. Irani and Sharif (2018) use PESTLE analysis, although they note that this tool may not suit all enterprises. They recommend using strategic planning tools to account for the myriad interconnected factors affecting food security.

Third, developing countries encounter more significant hurdles than their developed counterparts, primarily due to their lack of necessary infrastructure for sustainable development (Zaidi et al., 2019).

Effects

ECOLOGICAL INNOVATIONS

A key effect of the Circular Economy (CE) is the development of ecological innovations, which are assumed to reduce environmental damage caused by companies (Provasnek et al., 2017). These innovations minimize the environmental footprint of production and consumption activities. Crucial for the transition towards more sustainable societies, they involve

the propagation of individual technologies (Scarpellini et al., 2020). Green innovations necessitate enhanced cooperation among stakeholders due to their reliance on external knowledge and information (Kiefer et al., 2019). For the CE to thrive, an ecosystem designed for cooperative recycling is necessary, regardless of the existence of perfectly recyclable materials (Rajala et al., 2018).

A recent study outlines two main pathways for ecological innovations: cleaner production and green product design. The positive impact of these innovations on companies is contingent on their structure, characteristics, specific innovation strategies, and industry context (Demirel and Danisman, 2019).

Scarpellini et al. (2020) classify eco-innovations related to the CE as: investments in eco-innovation, eco-design, investments in innovative and renewable equipment or processes for energy efficiency, and R&D investment. They posit that informal environmental management tools can influence not only the level of circular ecological innovation but also the circular activity of the company, thus strengthening the circular material cycle (Scarpellini et al., 2020).

Jakhar et al. (2019) elaborate on why different companies adopt varied circular practices despite similar stakeholder pressures. The determinant lies in their innovative capacity, which can be exploratory, where companies are primed for swift changes and can achieve sustainable competitive advantage, or exploitative, where they resist circular needs. In the absence of incentives to adopt the CE, stakeholders can negatively influence innovative, exploitative-type capabilities.

SUPPLY CHAIN MANAGEMENT IN THE CIRCULAR ECONOMY

Despite the CE's potential to foster business sustainability, most companies struggle to integrate it into their strategies, business models, and operations (Stewart and Niero, 2018; Agrawal et al., 2019).

Khan et al. (2020) reveal that companies which have made the attempt successfully identify and respond to circular opportunities. Specifically, they use life-cycle assessments, develop green products and sustainable innovations, and achieve industrial symbiosis.

Another CE pillar is green supply chain management (GSCM), which can generate value for both companies and society, influencing even public policy (Tang, 2018). Frei, Jack and Krzyzaniak (2020) argue that with the correct approach to reverse supply chain organization, sustainability, loss prevention, and profit optimization can coexist (Frei et al., 2020). Some organizations have indeed benefited from aligning GSCM and the CE, with the former focusing on environmental performance and the latter on economic performance (Liu et al., 2018; Ripanti and Tjahjono, 2019). While GSCM in emerging markets presents immense research

potential (Tang, 2018), most studies have been conducted in developed countries.

ARTIFICIAL INTELLIGENCE AND THE CIRCULAR ECONOMY

The third aspect closely tied to the Circular Economy (CE) as a benefit is artificial intelligence (AI). Nedelea et al. (2018) propose that companies can utilize their innovation, management, and intellectual capital to gain a competitive edge, with human capital playing a central role. Employees can be inspired and educated within an organizational culture oriented towards the CE.

AI also presents significant opportunities for the CE, offering tools that can optimize industrial processes and predict potential behaviors that help manage waste. Such capabilities have seen remarkable improvements in recent years. It's critical to foster AI systems that can tackle complex challenges, leveraging big data analysis and machine learning (Sriram, 2006).

The Circular Economy in a Global Context

The concept of the CE has garnered considerable attention in policy making within the European Union (EU). The EU is among the regions implementing measures to support the transition from a linear economy to a CE as part of sustainable development strategies (Völker, 2020).

Further studies are needed on remanufacturing business models in China, a pioneer in the CE (Shao, 2019). Zhu et al.'s (2019) analysis of the economic viability and entrepreneurial spirit of circular businesses in China shows that a circular approach can help realize ecological, economic, and social goals in emerging economies, with entrepreneurship being crucial to these goals (Zhu et al., 2019).

CONCLUSION

The aim of identifying and systematizing journal articles on sustainability and the CE was to uncover unexplored facets of the topic or those that require more in-depth study. This work augments existing knowledge by systematically synthesizing research on the subject and highlighting gaps in the literature. It enhances the existing literature by providing a systematic review of sustainability and the CE, laying a theoretical groundwork for future empirical research.

The CE has been proposed as a solution to the world's environmental crisis, but adopting and applying this business management paradigm is challenging (Gupta et al., 2019). Further studies are needed on effective CE implementation, which should be examined in the context of sustainability, innovation, and entrepreneurship. As a sub-discipline, research on the CE is still in its early stages.

Achieving Goal 12 (one of the United Nations' Sustainable Development Goals) still necessitates changes in our current production and consumption patterns. Hence, we must persist in investing in sustainability and circular production models for the CE to become the global economic paradigm.

Implications for Management

The integration of the Circular Economy (CE) across the business landscape is necessary, though it's not a simple process. Suggestions for business leaders include: investing in the development of their human resources to equip them with necessary skills; directing funds towards research, development, and innovation (R+D+i) to formulate programs that encourage CE implementation and transition from linear to circular systems; investing in equipment and facilities that are compliant with the CE; and allocating further resources to investigate the most efficient methods to accomplish these steps. Although this will demand significant capital investment, the long-term returns promise to be considerable.

Limitations and Future Research

The primary limitations of this study include its qualitative nature, which may yield subjective outcomes that could be enhanced by additional empirical evidence. The sole use of a systematic literature review as the methodology, excluding SCI journals with a multidisciplinary approach to environmental management and sustainability, is another limitation; future research could incorporate other methods. Relying on a single database also presents a limitation, which future studies can aim to rectify.

Subsequent research on the CE could leverage time series data and focus more on developing nations. The influence of trading dynamics, secondary raw materials, and recycling on various macroeconomic factors could also be explored.

This systematic review underscores that the study of CE and sustainability is a promising field. Numerous research gaps have been highlighted, hinting at opportunities for future research endeavors.

On one hand, the role of social actors needs more focus due to identified gaps in the literature. Therefore, CE should be viewed through the lenses of businesses, governments, and households, considering that the creation of efficient CE and sustainability systems are of significant interest to organizations and societies. The design and deployment of integrated CE and sustainability systems could enhance business competitiveness, create more jobs, improve societal well-being, and adapt regulatory frameworks to foster strategic synergies.

On the other hand, digital transformation is poised to reshape the future of CE and sustainability. The development of digital systems that can handle vast data volumes and the implementation of mechanisms to manage circular business models present a promising field of research. Efficient management of circular processes is important, but without robust security

and protection systems, the mere availability of valuable knowledge sources won't necessarily confer competitive advantages. Hence, future studies could enrichingly explore the determinants, effects, and implications of automatic CE process safety system implementation.

REFERENCES

Agrawal, V. V., Atasu, Atalay., & Van Wassenhovec (2019). New Opportunities for Operations Management Research in Sustainability. *M\&Som-Manufacturing & Service Operations Management, 21*(1), 1-12. DOI: 10.1287/msom.2017.0699

Agyemang, M., Kusi-Sarpong, S., Khan, S., Mani, V., Rehman, S., & Kusi-Sarpong, H. (2019). Drivers and barriers to circular economy implementation: An explorative study in Pakistan's automobile industry. *Management Decision*, 971-994. DOI: 10.1108/MD-11-2018-1178

Ahmed, B. (2018). Who takes responsibility for the climate refugees? *International Journal of Climate Change Strategies and Management*. DOI: 10.1108/IJCCSM-10-2016-0149

Allwood, J. M., Ashby, M. F., Gutowski, T. G., & Worrell, E. (2011). Material efficiency: A white paper. *Resources, Conservation and Recycling, 55*(3), 362-381. DOI: 10.1016/j.resconrec.2010.11.002

Andronie, M., Simion, V., Gurgu, E., Dijmărescu, A., & Dijmărescu, I. (2019). Social responsibility of firms and the impact of bio-economy in intelligent use of renewable energy sources. *The Amfiteatru Economic journal, 21*(52), 520-520. DOI: 10.24818/ea/2019/52/520

Bag, S., Gupta, S., & Foropon, C. (2019). Examining the role of dynamic remanufacturing capability on supply chain resilience in circular economy. *Management Decision, 57*(4), 840-862. DOI: 10.1108/ MD-07-2018-0724

Barbu, C. M., Florea, D. L., Ogarcă, R. F., & Barbu, M. C. (2018). From Ownership to access: How the sharing economy is changing the consumer behavior. *Amfiteatru Economic, 20*(48), 373-387. DOI: 10.24818/ea/2018/48/373

Bassi, F., & Dias, J. G. (2020). Sustainable development of small‐and medium‐sized enterprises in the European Union: A taxonomy of circular economy practices. *Business Strategy and the Environment*, *29*(6), 2528-2541. DOI: 10.1002/bse.2518

Brown, P. J., & Bajada, C. (2018). An economic model of circular supply network dynamics: Toward an understanding of performance measurement in the context of multiple stakeholders. *Business Strategy and the Environment, 27*(5), 643-655. DOI: 10.1002/bse.2069

Bundgaard, A. M., & Huulgaard, R. D. (2019). Luxury products for the circular economy? A case study of Bang & Olufsen. *Business Strategy and the Environment, 28*(5), 699-709. DOI: 10.1002/bse.2274

Cainelli, G., D' Amato, A., & Mazzanti, M. (2020). Resource efficient eco-innovations for a circular economy: Evidence from EU firms. *Research Policy*, 49(1). DOI: 10.1016/j.respol.2019.103827

Centobelli, P., Cerchione, R., Chiaroni, D., Del Vecchio, P., & Urbinati, A. (2020). Designing business models in circular economy: A systematic literature review and research agenda. *Business Strategy and the Environment*, *29*(4), 1734-1749. DOI: 10.1002/bse.2466

Chen, L. H., Hung, P., & Ma, H. W. (2020). Integrating circular business models and development tools in the circular economy transition process: A firm‐level framework. *Business Strategy and the Environment*, *29*(5), 1887-1898. DOI: 10.1002/bse.2477

Corvellec, H., & Stal, H. I. (2019). Qualification as corporate activism: How Swedish apparel retailers attach circular fashion qualities to take-back systems. *Scandinavian Journal of Management*, *35*(3), 101046. DOI: 10.1016/j.scaman.2019.03.002

Corvellec, H., Bohm, S., Stowell, A., & Valenzuela, F. (2020). Introduction to the special issue on the contested realities of the circular economy. *Culture and Organization*, *26*(2), 97-102. DOI: 10.1080/14759551.2020.1717733

D' Adamo, I., Gastaldi, M., & Rosa, P. (2020). Recycling of end-of-life vehicles: Assessing trends and performances in Europe. *Technological Forecasting and Social Change*, *152*, 119887. DOI: 10.1016/j.techfore.2019.119887

Daddi, T., Ceglia, D., Bianchi, G., & Barcellos, M. (2019). Paradoxical tensions and corporate sustainability: A focus on circular economy business cases. *Corporate Social Responsibility and Environmental Management*, *26*(4), 770-780. DOI: 10.1002/csr.1719

Demirel, P., & Danisman, G. O. (2019). Eco‐innovation and firm growth in the circular economy: Evidence from European small‐and medium‐sized enterprises. *Business Strategy and the Environment*, *28*(8), 1608-1618. DOI: 10.1002/bse.2336

Despeisse, M., Baumers, M., Brown, P., Charnley, F., Ford, S. J., Garmulewicz, A., & Rowley, J. (2017). Unlocking value for a circular economy through 3D printing: A research agenda. *Technological Forecasting and Social Change*, *115*, 75-84. DOI: 10.1016/j.techfore.2016.09.021

Dey, P. K., Malesios, C., De, D., Budhwar, P., Chowdhury, S., & Cheffi, W. (2020). Circular economy to enhance sustainability of small and medium‐sized enterprises. *Business Strategy and the Environment*, *29*(6), 2145-2169. DOI: 10.1002/bse.2492

Dubey, R., Gunasekaran, A., Childe, S., & Papadopoulos, T. (2019). Supplier relationship management for circular economy: Influence of external pressures and top management commitment. *Management Decision*, *57*(4), 767-790. DOI: 10.1108/MD-04-2018-0396

Edgeman, R. (2020). Urgent evolution: excellence and wicked Anthropocene Age challenges. *Total Quality Management & Business Excellence*, *31*(5-6), 469-482. DOI: 10.1080/14783363.2018.1430510

Ellen MacArthur Foundation [EMAF] (2015). Growth Within: A Circular Economy Vision for a Competitive Europe, Retrieved from https:// www.ellenmacarthurfoundation.org/assets/downloads/publications/ Ellen MacArthurFoundation_Growth - Within_July15.pdf

Esposito, M., Tse, T., & Soufani, K. (2018). Introducing a circular economy: new thinking with new managerial and policy implications. *California Management Review, 60*(3), 5-19. DOI: 10.1177/0008125618764691

European Commission. (2018). *Report on Critical Raw Materials*

Farooque, M., Zhang, A., & Liu, Y. (2019). Barriers to circular food supply chains in China. *Supply Chain Management: An International Journal, 24*(5), 677-69. DOI: 10.1108/SCM-10-2018-0345

Frei, R., Jack, L., & Krzyzaniak, S. A. (2020). Sustainable reverse supply chains and circular economy in multichannel retail returns. *Business Strategy and the Environment, 29*(5), 1925-1940. DOI: 10.1002/bse.2479

Frishammar, J., & Parida, V. (2019). Circular business model transformation: A roadmap for incumbent firms. *California Management Review, 61*(2), 5-29. DOI: 10.1177/0008125618811926

Garcia - Quevedo, J., Jove - Llopis, E., & Martinez - Ros, E. (2020). Barriers to the circular economy in European small and medium - sized firms. *Business Strategy and the Environment, 29*(6), 2450-2464. DOI: 10.1002/bse.2513

Gao, L., Melero, I., & Sese, F. J. (2020). Multichannel integration along the customer journey: a systematic review and research agenda.

The Service Industries Journal, 40(15-16), 1087-1118. DOI: 10.1080/02642069.2019.1652600

Geissdoerfer, M., Savaget, P., Bocken, N.M., Hultink, E.J. (2017). The Circular Economy- A new sustainability paradigm? *Journal of Cleaner Production, 143*, 757-768. DOI: 10.1016/j.jclepro.2016.12.048

Genovese, A., Acquaye, A. A., Figueroa, A., & Koh, S. L. (2017). Sustainable supply chain management and the transition towards a circular economy: Evidence and some applications. *Omega, 66*(B), 344-357. DOI: 10.1016/j.omega.2015.05.015

Ghisellini, P., Cialani, C., 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*, 11-32. DOI: 10.1016/j.jclepro.2015.09.007

Gupta, S., Chen, H., Hazen, B. T., Kaur, S., & Gonzalez, E. D. (2019). Circular economy and big data analytics: A stakeholder perspective. *Technological Forecasting and Social Change, 144*, 466-474. DOI: 10.1016/j.techfore.2018.06.030

Hazen, B. T., Mollenkopf, D. A., & Wang, Y. (2017). Remanufacturing for the circular economy: An examination of consumer switching behavior. *Business Strategy and the Environment, 26*(4), 451-464. DOI: 10.1002/bse.1929

Hopkinson, P., Zils, M., Hawkins, P., & Roper, S. (2018). Managing a complex global circular economy business model: opportunities and challenges.

California Management Review, *60*(3), 71-94. DOI: 10.1177/0008125618764692

Horvath, B., Khazami, N., Ymeri, P., & Fogarassy, C. (2019). Investigating the current business model innovation trends in the biotechnology industry. *Journal of Business Economics and Management*, *20*(1), 63-85. DOI: 10.3846/jbem.2019.6880

Hvass, K. K., & Pedersen, E. R. (2019). Toward circular economy of fashion: Experiences from a brand's product take-back initiative. *Journal of Fashion Marketing and Management*, *23*(3), 345-365. DOI: 10.1108/JFMM-04-2018-0059

Ionascu, I., & Ionascu, M. (2018). Business models for circular economy and sustainable development: The case of lease transactions. *Amfiteatru Economic*, *20*(48), 356-372. DOI: 10.24818/ea/2018/48/356

Irani, Z., & Sharif, A. M. (2018). Food security across the enterprise: a puzzle, problem or mess for a circular economy? *Journal of Enterprise Information Management*, *31*(1), 2-9. DOI: 10.1108/JEIM-03-2017-0045

Jabbour, C. J. (2019). Unlocking the circular economy through new business models based on large-scale data: an integrative framework and research agenda. *Technological Forecasting and Social*, *144*, 546- 552. DOI: 10.1016/j.techfore.2017.09.010

Jaeger, B., & Upadhyay, A. (2020). Understanding barriers to circular economy: cases from the manufacturing industry. *Journal of Enterprise Information Management*. DOI: 10.1108/JEIM-02-2019-0047

Jakhar, S. K., Mangla, S. K., Luthra, S., & Kusi-Sarpong, S. (2019). When stakeholder pressure drives the circular economy. *Management Decision*. DOI: 10.1108/MD-09-2018-0990

Jones, P., & Wynn, M. G. (2019). The circular economy, natural capital and resilience in tourism and hospitality. *International Journal of Contemporary Hospitality Management*, *31*(6), 2544-2563. DOI: 10.1108/IJCHM-05-2018-0370

Kalverkamp, M. (2018). Hidden potentials in open-loop supply chains for remanufacturing. *The International Journal of Logistics Management*, *29*(4), 1125-1146. DOI: 10.1108/IJLM-10-2017-0278

Kalverkamp, M., & Raabe, T. (2018). Automotive remanufacturing in the circular economy in Europe: marketing system challenges. *Journal of Macromarketing*, *38*(1), 112-130. DOI: 10.1177/0276146717739066

Karagiannis, I., Vouros, P., Skouloudis, A., & Evangelinos (2019). Sustainability reporting, materiality, and accountability assessment in the airport industry. *Business Strategy and the Environment*, *28*(7), 1370-1405. DOI: 10.1002/bse.2321

Katz‐Gerro, T., & Lopez Sintas, J. (2019). Mapping circular economy activities in the European Union: Patterns of implementation and their correlates in small and medium‐sized enterprises. *Business Strategy and the Environment*, *28*(4), 485-496. DOI: 10.1002/bse.2259

Kębłowski, W., Lambert, D., & Bassens, D. (2020). Circular economy and the city: an urban political economy agenda. *Culture and Organization, 26*(2), 142-158. DOI: 10.1080/14759551.2020.1718148

Khan, O., Daddi, T., & Iraldo, F. (2020). Microfoundations of dynamic capabilities: Insights from circular economy business cases. *Business Strategy and the Environment*, *29*(3), 1479-1493. DOI: 10.1002/bse.2447

Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, conservation and recycling*, *127*, 221-232. DOI: 10.1016/j.resconrec.2017.09.005

Korhonen, J., Honkasalo, A., & Seppala, J. (2018). Circular economy: the concept and its limitations. *Ecological economics, 143*, 37-46. DOI: 10.1016/j.ecolecon.2017.06.041

Kunz, N., Mayers, K., & Van Wassenhove, L. N. (2018). Stakeholder views on extended producer responsibility and the circular economy. *California Management Review, 60*(3), 45-70. DOI: 10.1177/0008125617752694

Laurenti, R., Singh, J., Sinha, R., Potting, J., & Frostell, B. (2016). Unintended environmental consequences of improvement actions: a qualitative analysis of systems' structure and behavior. *Systems research and behavioral science, 33*(3), 381-399. DOI: 10.1002/sres.2330

Linder, M., & Williander, M. (2017). Circular business model innovation: inherent uncertainties. *Business strategy and the environment, 26*(2), 182-196. DOI: 10.1002/bse.1906

Liu, J., Feng, Y., Zhu, Q., & Sarkis, J. (2018). Green supply chain management and the circular economy. *International Journal of Physical Distribution & Logistics Management*, *48*(8), 794-817. DOI: 10.1108/IJPDLM-01-2017-0049

Low, J. S., & Ng, Y. T. (2018). Improving the economic performance of remanufacturing systems through flexible design strategies: a case study based on remanufacturing laptop computers for the cambodian market. *Business Strategy and the Environment, 27*(4), 503-527. DOI: 10.1002/bse.2017

Lozano, R. (2020). Analysing the use of tools, initiatives, and approaches to promote sustainability in corporations. *Corporate Social Responsibility and Environmental Management*, *27*(2), 982-998. DOI: 10.1002/csr.1860

Malinauskaite, J., Jouhara, H., Czajczyńska, D., Stanchev, P., Katsou, E., Rostkowski, P., & Anguilano, L. (2017). Municipal solid waste management and waste-to-energy in the context of a circular economy and energy recycling in Europe. *Energy, 141*, 2013-2044. DOI: 10.1016/j.energy.2017.11.128

Mishra, S., Singh, S., Johansen, J., Cheng, Y., & Farooq, S. (2019). Evaluating indicators for international manufacturing network under circular economy. *Management Decision, 57*(4), 811-839. DOI: 10.1108/MD-05-2018-0565

Murray, A., Skene, K., & Haynes, K. (2017). The circular economy: an interdisciplinary exploration of the concept and application in a global

context. *Journal of business ethics, 140*(3), 369-380. DOI: 10.1007/s10551-015-2693-2

Nascimento, D., Alencastro, V., Quelhas, O., Caiado, R., Garza-Reyes, J., & Rocha-Lona, L. (2019). Exploring Industry 4.0 technologies to enable circular economy practices in a manufacturing context. *Journal of Manufacturing Technology Management, 30*(3), 607-627. DOI: 10.1108/JMTM-03-2018-0071

Nedelea, A. M., Huian, M. C., Birsan, M., & Bedrule-Grigoruţă, M. V. (2018). Modeled interdependencies between intellectual capital, circular economy and economic growth in the context of bioeconomy. *Amfiteatru Economic, 20*(49), 616-630. DOI: 10.24818/ ea/2018/49/616

Norris, L. (2019). Urban prototypes: Growing local circular cloth economies. *Business History, 61*(1), 205-224. DOI: 10.1080/00076791.2017.1389902

Pajunen, N., & Heiskanen, K. (2012). Drivers and Barriers in The Supply Chain‐The Importance of Understanding The Complexity of Recycling in The Industrial System. *In Xxvi International Mineral Processing Congress (Impc) 2012 Proceedings/New Delhi, India/24-28 September 2012.*, 04047-04056.

Pal, R. S. (2019). Circular fashion supply chain management: exploring impediments and prescribing future research agenda. *Journal of Fashion Marketing and Management: An International Journal, 23*(3), 298-307. DOI: 10.1108/JFMM-07-2019-166

Pamfilie, R., Firoiu, D., Croitoru, A. G., & Ionescu, G. H. (2018). Circular Economy‐A New Direction for the Sustainability of the Hotel Industry in Romania? *Amfiteatru Economic, 20*(48), 388-404. DOI: 10.24818/ea/2018/48/388

Parida, V., Burstrom, T., Visnjic, I., & Wincent, J. (2019). Orchestrating industrial ecosystem in circular economy: A two-stage transformation model for large manufacturing companies. *Journal of Business Research, 101*, 715-725. DOI: 10.1016/j.jbusres.2019.01.006

Parida, V., & Wincent, J. (2019). Why and how to compete through sustainability: a review and outline of trends influencing firm and network- level transformation. *International Entrepreneurship and Management Journal, 15*(1), 1-19. DOI: 10.1007/s11365-019-00558-9

Pedersen, E., Earley, R., & Andersen, K. (2019). From singular to plural: exploring organisational complexities and circular business model design. *Journal of Fashion Marketing and Management: An International Journal, 23*(3), 308-326. DOI: 10.1108/JFMM-04-2018-0062

Pelau, C., & Chinie, A. C. (2018). Econometric model for measuring the impact of the education level of the population on the recycling rate in a circular economy. *Amfiteatru Economic, 20*(48), 340-355. DOI: 10.24818/ea/2018/48/340

Perey, R. B. (2018). The place of waste: Changing business value for the circular economy. *Business Strategy and the Environment, 27*(5), 631-642. DOI: 10.1002/bse.2068

Pinheiro, M., Seles, B., Fiorini, P., Jugend, D., de Sousa Jabbour, A., da Silva, H., & Latan, H. (2019). The role of new product development in underpinning the circular economy. *Management Decision, 57*(4), 840-862. DOI: 10.1108/MD-07-2018-0782

Prieto‐Sandoval, V., Jaca, C., Santos, J., Baumgartner, R. J., & Ormazabal, M. (2019). Key strategies, resources, and capabilities for implementing circular economy in industrial small and medium enterprises. *Corporate Social Responsibility and Environment, 26*(6), 1473-1484. DOI: 10.1002/csr.1761

Prieto‐Sandoval, V., Ormazabal, M., Jaca, C., & Viles, E. (2018). Key elements in assessing circular economy implementation in small and medium‐sized enterprises. *Business Strategy and the Environment, 27*(8), 1525-1534. DOI: 10.1002/bse.2210

Provasnek, A. K., Sentic, A., & Schmid, E. (2017). Integrating eco‐innovations and stakeholder engagement for sustainable development and a social license to operate. *Corporate Social Responsibility and Environmental Management, 24*(3), 173-185. DOI: 10.1002/csr.1406

Rajala, R., Hakanen, E., Mattila, J., Seppala, T., & Westerlu. (2018). How do intelligent goods shape closed-loop systems? *California Management Review, 60*(3), 20-44. DOI: 10.1177/0008125618759685

Randers, J. (2012). *2052: A global forecast for the next forty years.* Chelsea Green Publishing.

Ripanti, E. F., & Tjahjono, B. (2019). Unveiling the potentials of circular economy values in logistics and supply chain management. *The International Journal of Logistics Management, 30(3), 723-742. DOI: 10.1108/IJLM-04-2018-0109*

Scarpellini, S., Valero‐Gil, J., Moneva, J. M., & Andreaus, M. (2020). Environmental management capabilities for a "circular eco‐innovation. *Business Strategy and the Environment, 29*(5), 1850-1864. DOI: 10.1002/bse.2472

Sehnem, S. C. (2019). Circular business models: level of maturity. *Management Decision, 57*(4), 1043-1066. DOI: 10.1108/MD-07-2018-0844

Sehnem, S., Vazquez-Brust, D., Pereira, S., & Campos, L. (2019). Circular economy: benefits, impacts and overlapping. *Supply Chain Management: An International Journal, 24*(6), 784-804. DOI: 10.1108/SCM-06-2018-0213

Shao, J. (2019). Sustainable consumption in China: New trends and research interests. . *Business Strategy and the Environment, 28*(8),1507-1517. DOI: 10.1002/bse.2327

Shao, J., Huang, S., Lemus-Aguilar, I., & Unal, E. (2019). Circular business models generation for automobile remanufacturing industry in China. *Journal of Manufacturing Technology Management, 31*(3), 542-571. DOI: 10.1108/JMTM-02-2019-0076

Sharma, Y. K., Mangla, S. K., Patil, P. P., & Liu, S. (2019). When challenges impede the process For circular economy-driven sustainability practices in food supply chain. *Management Decision, 57*(4), 995-1017.

Smart, P., Hemel, S., Lettice, F., Adams, R., & Evans, S. (2017). Pre-paradigmatic status of industrial sustainability: a systematic review. *International Journal of Operations & Production Management, 37*(10), 1425-1450. DOI: 10.1108/IJOPM-02-2016-0058

Sriram, R. D. (2006). Artificial intelligence in engineering: Personal reflections. *Editorial to appear in Advanced Engineering Informatics*. DOI: 10.1016/j.aei.2005.12.002

Stewart, R., & Niero, M. (2018). Circular economy in corporate sustainability strategies: A review of corporate sustainability reports in the fast‐moving consumer goods sector. *Business Strategy and the Environment, 27*(7), 1005-1022. DOI: 10.1002/bse.2048

Tang, C. S. (2018). Socially responsible supply chains in emerging markets: Some research opportunities. *Journal of operations management, 57*, 1-10. DOI: 10.1016/j.jom.2018.01.002

Todeschini, B. V., Cortimiglia, M. N., Callegaro-de-Menezes, D., & Ghezzi, A. (2017). Innovative and sustainable business models in the fashion industry: Entrepreneurial drivers, opportunities, and challenges. *Business Horizons, 60*(6), 759-770. DOI: 10.1016/j.bushor.2017.07.003

Unal, E. U. (2019). Managerial practices for designing circular economy business models. *Journal of Manufacturing Technology Management, 30*(3), 561-589. DOI: 10.1108/JMTM-02-2018-0061

Unruh, G. (2018). Circular economy, 3D printing, and the biosphere rules. *California Management Review, 60*(3), 95-111. DOI: 10.1177/0008125618759684

Unterfrauner, E., Shao, J., Hofer, M., & Fabian, C. M. (2019). The environmental value and impact of the Maker movement−Insights from a cross‐case analysis of European maker initiatives. *Business Strategy and the Environment, 28*(8), 1518-1533. DOI: 10.1002/bse.2328

Urbinati, A., Chiaroni, D., & Chiesa, V. (2017). Towards a new taxonomy of circular economy business models. *Journal of Cleaner Production, 168*, 487-498. DOI: 10.1016/j.jclepro.2017.09.047

Vehmas, K. R. (2018). Consumer attitudes and communication in circular fashion. *Journal of Fashion Marketing and Management: An International Journal, 22*(3), 286-300. DOI: 10.1108/JFMM-08-2017-0079

Vimal, K., Rajak, S., & Kandasamy, J. (2019). Analysis of network design for a circular production system using multi-objective mixed integer linear programming model. *Journal of Manufacturing Technology Management, 30*(3), 628-646. DOI: 10.1108/JMTM-02-2018-0058

Volker, T. K. (2020). Indicator development as a site of collective imagination? The case of European Commission policies on the circular economy. *Culture and Organization, 26*(2), 103-120. DOI: 10.1080/14759551.2019.1699092

Vuţă, M. V. (2018). Assessment of the circular economy's impact in the EU economic growth. *Amfiteatru Economic, 20*(48), 248-261. DOI: 10.24818/ea/2018/48/248

Wu, H., Lv, K., Liang, L., & Hu, H. (2017). Measuring performance of Sustainable manufacturing with recyclable wastes: A case from China's iron and steel industry. *Omega, 66*(A), 38-47. DOI: 10.1016/j.omega.2016.01.009

Yazan, D., Yazdanpanah, V., & Fraccascia, L. (2020). Learning strategiccooperative behavior in industrial symbiosis: A game‐theoretic approach integrated with agent‐based simulation. *Business strategy and the environment, 29*(5), 2078-2091. DOI: 10.1002/bse.2488

Zaidi, S., Mirza, F., Hou, F., & Ashraf, R. (2019). Addressing the sustainable development through sustainable procurement: What factors resist the implementation of sustainable procurement in Pakistan? *Socio-Economic Planning Sciences, 68*(1). DOI: 10.1016/j.seps.2018.11.008

Zhu, Q., Jia, R., & Lin, X. (2019). Building sustainable circular agriculture in China: economic viability and entrepreneurship. *Management Decision, 57*(4), 1108-1122. DOI: 10.1108/MD-06-2018-0639

Zucchella, A., & Previtali, P. (2019). Circular business models for sustainable development: A "waste is food" restorative ecosystem. *Business Strategy and the Environment, 28*(2), 274-285. DOI: 10.1002/bse.2216