Sosyal Mucit Academic Review

Research Article / Araştırma Makalesi

Cited/Atıf: Karakaya, T. and Balcıoğlu, Y. S. (2026). Organizational sustainability through circular economy principles: A bibliometric analysis of research evolution and intellectual structure. *Sosyal Mucit Academic Review*, *7*(1), 23-59. doi: 10.54733/smar.1684944

Organizational Sustainability through Circular Economy Principles: A Bibliometric Analysis of Research Evolution and Intellectual Structure

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Received/ Başvuru: *27.04.2025* ***Accepted/ Kabul:*** *06.12.2025* ***Published/ Yayın:*** *28.01.2026*

Abstract

This study conducts a comprehensive bibliometric analysis of research at the intersection of circular economy principles and organizational sustainability to map the intellectual structure and evolution of this interdisciplinary field. We employed a multi-method bibliometric approach analyzing 411 publications from the Scopus database. The methodology combined performance analysis (publication trends, influential authors, journals, and countries) with science mapping techniques to reveal the conceptual structure and development of the field. The analysis reveals exponential growth in publications since 2016, with European institutions dominating research contributions. Five major thematic areas emerge: (1) conceptual integration of circular economy and sustainability paradigms, (2) circular business models and value creation, (3) supply chain and operations management for circularity, (4) organizational transformation and change management, and (5) performance measurement and impact assessment. The field has evolved from conceptual foundations toward implementation-focused research, with increasing attention to digital technologies as enablers. Social dimensions remain relatively underdeveloped compared to economic and environmental aspects. Our findings highlight theoretical contributions to understanding how circular economy principles can advance organizational sustainability across the triple bottom line. We identify significant limitations in current research, including geographic imbalance, methodological constraints, limited longitudinal studies, and underdeveloped social dimensions. The study outlines eight promising directions for future research: expanding geographic diversity, advancing methodological approaches, strengthening social dimension research, exploring digital transformation, investigating organizational capabilities, examining resilience connections, developing integrated theoretical frameworks, and exploring policy-practice interactions.

Keywords: circular economy, organizational sustainability, bibliometric analysis, sustainable business models

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Döngüsel Ekonomi İlkeleri Aracılığıyla Kurumsal Sürdürülebilirlik: Araştırma Evrimi ve Entelektüel Yapı Üzerine Bibliyometrik Bir Analiz

Öz

Bu çalışma, bu disiplinler arası alanın entelektüel yapısını ve gelişimini haritalandırmak için döngüsel ekonomi ilkeleri ve kurumsal sürdürülebilirliğin kesişme noktasındaki araştırmaların kapsamlı bir bibliyometrik analizini yapmaktadır. Scopus veri tabanındaki 411 yayını analiz eden çok yöntemli bir bibliyometrik yaklaşım kullandık. Metodoloji, alanın kavramsal yapısını ve gelişimini ortaya çıkarmak için performans analizini (yayın eğilimleri, etkili yazarlar, dergiler ve ülkeler) bilim haritalama teknikleriyle (ortak atıf analizi, bibliyografik birleştirme, anahtar kelime eş-oluşumu) birleştirdi. Analiz, 2016'dan bu yana yayınlarda üstel bir büyüme olduğunu ve Avrupa kurumlarının araştırma katkılarına hakim olduğunu ortaya koymaktadır. Beş ana tematik alan ortaya çıkmaktadır: (1) döngüsel ekonomi ve sürdürülebilirlik paradigmalarının kavramsal entegrasyonu, (2) döngüsel iş modelleri ve değer yaratma, (3) döngüsellik için tedarik zinciri ve operasyon yönetimi, (4) organizasyonel dönüşüm ve değişim yönetimi ve (5) performans ölçümü ve etki değerlendirmesi. Bu alan, kavramsal temellerden uygulama odaklı araştırmalara doğru evrilmiş ve dijital teknolojilere etkinleştirici olarak artan bir ilgi gösterilmiştir. Sosyal boyutlar, ekonomik ve çevresel boyutlara kıyasla nispeten daha az gelişmiştir. Bulgularımız, döngüsel ekonomi ilkelerinin üçlü kar hanesi boyunca kurumsal sürdürülebilirliği nasıl geliştirebileceğini anlamaya yönelik teorik katkıları vurgulamaktadır. Coğrafi dengesizlik, metodolojik kısıtlamalar, sınırlı boylamsal çalışmalar ve az gelişmiş sosyal boyutlar da dahil olmak üzere mevcut araştırmalardaki önemli sınırlamaları tespit ediyoruz. Çalışma, gelecekteki araştırmalar için sekiz umut verici yönün ana hatlarını çizmektedir: coğrafi çeşitliliği genişletmek, metodolojik yaklaşımları ilerletmek, sosyal boyut araştırmalarını güçlendirmek, dijital dönüşümü araştırmak, örgütsel yetenekleri araştırmak, esneklik bağlantılarını incelemek, entegre teorik çerçeveler geliştirmek ve politika-uygulama etkileşimlerini araştırmak.

Anahtar Kelimeler: döngüsel ekonomi, kurumsal sürdürülebilirlik, bibliyometrik analiz, sürdürülebilir iş modelleri

1. INTRODUCTION

Global economic systems have evolved under the dominance of a linear model of production and consumption. This model, also known as *"take-make-dispose"*, is based on a cycle of extracting resources, producing products and disposing of them after use (Ellen MacArthur Foundation, 2013). Nonetheless, global problems like rising resource shortage, worsening state of the environment, and climatic change continue to undermine the sustainable nature of a linear economy. In this context, there is a need for the idea of a circular economy as a viable alternative to a traditional economy (Korhonen et al., 2018b). The circular economy is envisioned as a system based on restoration and regeneration principles aimed at slowing down, reducing, and closing energy and material loops. The theoretical foundation for the circular economy is drawn from different intellectual streams, such as performance economy, industrial ecology, biomimicry, and the Cradle to Cradle (Ellen MacArthur Foundation & McKinsey Center for Business and Environment, 2015). The core principles for the circular economy are based on preserving values for products and materials, minimizing generation at source, and conserving and preserving nature (Morseletto, 2020).

Organizational sustainability is a managerial paradigm aimed at improving enterprises' economic, environmental, and social performance in a harmonious way (Dyllick and Hockerts, 2002). The theoretical structure identified as *"triple bottom line"*, as discussed in detail in Elkington (1998), is based on organizations being required to move away from profit-seeking alone towards meeting ecological and societal responsibilities. Corporate strategies need to embed in corporate frameworks environmental, social, and governance elements in order to encourage sustainable value generation (Bansal and Song, 2017). The relationship between circular economy principles and organizational sustainability has in recent times drawn increased scrutiny. The application of circular economy principles in organizational context is identified as a major enabler for organizations in making them improve in their performance in matters related to sustainability (Schroeder et al., 2019). A thorough conceptualization and appropriate application in such circumstances still lacks (Velenturf and Purnell, 2021; Geissdoerfer et al., 2017).

The current research explores different interpretations related to circular economy and sustainability. Some authors have assumed that circular economy is a way to achieve sustainability (Schroeder et al., 2019), while some have assumed that circular economy is a rather restricted area in terms of sustainability, not involving society (Kirchherr et al., 2017). The different perspectives in the literature indicate that the relationship between circular economy and organizational sustainability needs to be examined in more depth. The integration of organizational sustainability and circular economy principles has the potential to improve the economic performance of businesses while reducing their environmental impact. Circular business models can provide businesses with a competitive advantage by increasing resource efficiency, reducing waste, and creating new revenue streams (Lüdeke-Freund et al., 2019). However, realizing this integration faces several challenges in technical, economic,

organizational and social dimensions (de Jesus and Mendonça, 2018). Research examining the integration of circular economy principles into organizational sustainability has increased rapidly in recent years. These studies address the impacts of circular economy practices on the economic, environmental and social performance of businesses (Khan et al., 2021), the development of circular business models (Lüdeke-Freund et al., 2019), circularity in supply chain management (Kazancoglu et al., 2021), and the integration of Industry 4.0 technologies into the circular economy (Kouhizadeh et al., 2021). However, a systematic analysis of the intellectual structure, evolutionary development and key themes of this research has not yet been carried out.

1.1. Problem Statement

The global economic system has traditionally operated on a linear "take-make-dispose" model, which continues to exacerbate resource shortages, environmental degradation, and climate change. The circular economy offers a promising alternative by fostering resource efficiency and regenerative design. Simultaneously, organizations face mounting pressure to improve their sustainability performance across economic, environmental, and social dimensions.

Despite growing interest in both circular economy and organizational sustainability, there exists a significant knowledge gap regarding their integration. The relationship between these concepts remains conceptually ambiguous and practically challenging. Organizations struggle to implement circular economy principles effectively due to technical, economic, organizational, and social barriers. Additionally, the literature shows divergent perspectives on whether circular economy is a means to achieve sustainability or a more restricted approach that does not fully encompass social dimensions.

While research on the integration of circular economy principles into organizational sustainability has increased rapidly in recent years, a systematic analysis of the intellectual structure, evolutionary development, and key themes of this research is lacking. Without understanding how these concepts interact conceptually and practically, organizations cannot fully harness circular economy's potential to enhance their sustainable performance.

Addressing this knowledge gap requires not only reviewing existing literature but systematically revealing the intellectual structures, thematic patterns, and conceptual evolution that bibliometric analysis uniquely provides, thereby advancing theoretical understanding of how these domains interconnect and inform each other.

1.2. Research Objectives

- To systematically analyze the evolution and intellectual structure of research integrating circular economy principles and organizational sustainability.
- To identify key theoretical frameworks, conceptual models, and empirical approaches that connect circular economy practices with organizational sustainability outcomes.

- To classify the barriers, drivers, and enablers of successful integration of circular economy principles into organizational sustainability strategies.
- To evaluate how different organizational contexts (size, sector, geographic location) influence the application and effectiveness of circular economy principles for sustainable performance.

1.3. Research Questions

- How has research on the integration of circular economy principles and organizational sustainability evolved over time, and what are the major intellectual streams contributing to this field?
- What theoretical frameworks and conceptual models effectively explain the relationship between circular economy practices and organizational sustainability performance?
- What are the key barriers, drivers, and enablers for the successful implementation of circular economy principles in organizational contexts?
- How do organizational characteristics (size, industry, geography) influence the adoption and effectiveness of circular economy practices for sustainability performance?
- What methodological approaches have been most effective in studying the integration of circular economy and organizational sustainability, and what new methods might advance our understanding?
- How can the integration of circular economy principles enhance organizational performance across the triple bottom line (economic, environmental, and social) dimensions?

2. THEORETICAL FRAMEWORK

2.1. Organizational Sustainability Concepts

Corporate sustainability is a management approach that requires businesses not only to focus on economic goals but also to fulfill their environmental and social responsibilities. The concept of corporate sustainability refers to the integration of environmental, social and governance factors into business strategies in order to create long-term value. Corporate sustainability aims to protect natural resources, promote social justice and adhere to ethical management principles while conducting business activities. In this framework, it aims to strike a balance between economic gain and social welfare and environmental protection (Sheehy and Farneti, 2021).

The idea of corporate sustainability originated in 1987 in Brundtland Report. The report had outlined sustainability as meeting current needs without depriving future generations of opportunities to meet their own needs (United Nations, 1987). Corporate sustainability uses this broader definition and applies it to businesses. It is when businesses have to reconcile their financial aspirations and nature and society's needs (Bansal and Song, 2017).

There are a variety of different corporate sustainable definitions. According to Dyllick and Hockerts (2002), corporate sustainability is about fulfilling a company's stakeholder needs, such as employees, shareholders, pressure groups, and clients. It is equally about being able to satisfy

stakeholder needs in the future. Van Marrewijk (2003) defined corporate sustainability as corporate activities that demonstrate the incorporation of social and environmental concerns into business operations and interactions with stakeholders. Bansal and Song (2017), in their study examining the differences between corporate social responsibility and corporate sustainability, stated that CSR focuses on community and social issues and is generally addressed within the framework of obligations to stakeholders. In contrast, corporate sustainability focuses on environmental management and is based on the understanding that the firm is embedded in other social and natural systems (Meuer et al., 2020).

Sheehy and Farneti (2021) examined the differences between corporate sustainability and the concepts of sustainability and sustainable development. Sustainability is defined as a broad global policy agenda focusing on ecological conservation, while sustainable development is a concept that focuses on achieving economic development without unduly jeopardizing the environment. Corporate sustainability, on the other hand, is based on the view that companies and managers have a responsibility beyond profit.

Corporate sustainability is influenced by three key dimensions: economic, environmental, and social. The economic dimension refers to the sustainable operation of businesses by maintaining their profitability and competitive advantages. The environmental dimension includes factors such as protecting natural resources, reducing carbon emissions and minimizing environmental impacts. The social dimension includes issues such as employee welfare, social equality and ethical business practices. The combination of these three dimensions enables businesses to create long-term value rather than focusing only on short-term financial success (Dyllick and Hockerts, 2002). This framework, developed by Elkington (1998) and called *"triple bottom line"*, suggests that businesses should evaluate their economic, environmental and social performance in a balanced way.

Corporate sustainability also aims to increase the accountability of businesses to their stakeholders. Within the framework of stakeholder theory, it is argued that companies should take into account the needs of other stakeholders such as employees, customers, suppliers, and society, in addition to the interests of shareholders (Freeman, 1984). In this context, corporate sustainability contributes to strengthening the social legitimacy of businesses and gaining the trust of stakeholders (Ioannou and Serafeim, 2015).

In recent years, corporate sustainability has gained more importance in the strategic management processes of businesses. Reducing environmental impacts and increasing energy efficiency can not only provide cost savings but also strengthen the reputation of businesses. Similarly, employee welfare policies can increase labor productivity and facilitate the attraction of talented employees (Grewal and Serafeim, 2020). Moreover, measuring and reporting corporate sustainability performance can strengthen stakeholder relations by increasing the accountability of businesses (Simnett et al., 2009).

However, the successful implementation of corporate sustainability practices requires businesses to restructure their internal processes and management systems. Management control systems play an important role in setting and achieving sustainability goals (Ioannou et al., 2016). In this context, within the framework of corporate sustainability, alternative business models and approaches have been developed for businesses to fulfill their economic, environmental and social responsibilities. Circular economy is one of these alternative approaches (Ellen MacArthur Foundation, 2013).

2.2. Circular Economy Principles

The concept of circular economy emerged in the 1960s when Kenneth Boulding drew attention to the importance of closed systems in his work *"Spaceship Earth"* (Corvellec et al., 2022). The term *"circular economy"* was first used by Pearce & Turner (1990), who proposed the transformation of the linear *"resource-product-pollution"* model into a circular *"resource-product-renewed resources"* system (Ferasso et al., 2020; Jawahir and Bradley, 2016). The concept was influenced by approaches such as industrial ecology, cleaner production and Cradle to Cradle, and was adopted as a national strategy in Germany and Japan in the 1990s and in China in the 2000s (Korhonen et al., 2018b; McDowall et al., 2017). In the European Union, it entered the policy agenda with the *"Circular Economy Action Plan"* of 2015 (Fitch-Roy et al., 2020). The work of the Ellen MacArthur Foundation (EMF) has increased the global recognition of the concept and the circular economy has been defined as a *"restorative and regenerative system"* (Ellen MacArthur Foundation, 2013; Morseletto, 2020).

There are more than 100 definitions of circular economy in the literature (Kirchherr et al., 2017). According to the EMF, circular economy is an economic system that is restorative and regenerative by design, aims to maximize the value of products, components and materials, and eliminates the concept of waste (Ellen MacArthur Foundation, 2013). Kirchherr et al. (2017) state that circular economy definitions often focus on the 3Rs (reduce, reuse, recycle) principles, economic prosperity and environmental quality, but the social dimension is often neglected. Liu (2012) defined circular economy as an economic system characterized by the principle of sustainable growth and less dependent on the depletion of natural resources than traditional economies and emphasized the resource efficiency dimension. Geissdoerfer et al. (2017) defined circular economy as a regenerative system in which material and energy cycles are slowed down, closed and narrowed through long-lasting design, maintenance, repair, reuse, remanufacturing and recycling and drew attention to operational dimensions. Tambovceva et al. (2021) emphasized the potential of circular economy to decouple economic growth from natural resource consumption and environmental pollution.

The circular economy is based on a set of fundamental principles that guide its implementation. The core principle of the circular economy, 3R (Reduce, Reuse, Recycle), envisages reducing material use, reusing products and recycling end-of-life materials (Tambovceva et al., 2021).

Potting et al. (2017) and Reike et al. (2018) expanded this framework and developed approaches such as 4R, 6R and 10R.

Ellen MacArthur Foundation (2013) defined two separate material cycles for the circular economy: technical and biological cycles. The technical cycle aims to ensure that finite materials such as metals and polymers retain their value through repair, reuse and recycling, while the biological cycle ensures that renewable materials (e.g. food and natural fibers) biodegrade and return safely to the ecosystem. This distinction is inspired by the Cradle to Cradle approach (Braungart et al., 2007).

Restorative and regenerative design are important principles of the circular economy. Restorative design aims to restore ecosystems, while regenerative design aims to support the self-renewal capacity of natural systems (Morseletto, 2020). In technical cycles, this principle is implemented through the repair and renewal of materials, while in biological cycles it is realized through practices such as regenerative agriculture (Ellen MacArthur Foundation, & McKinsey Center for Business and Environment, 2015).

The circular economy adopts the principle of *"waste equals food"* by redefining waste as a process input (McDonough and Braungart, 2010). This principle requires products to be optimized for reuse and recycling from the design stage (Ellen MacArthur Foundation, 2013).

Adopting a systems thinking approach, the circular economy recognizes the interconnectedness of economic activities and requires consideration of the effects of changes on the system (Ellen MacArthur Foundation, 2013). Circular business models bring circular economy principles to the business level with strategies such as product-service systems, sharing economy and resource recovery (Bocken et al., 2016).

The implementation of circular economy principles faces various challenges in technical, economic, institutional and social dimensions (de Jesus and Mendonça, 2018). Technical challenges include inadequate technologies for recycling and reuse of materials, limitations in material properties, and gaps in waste management infrastructure (Velis and Vrancken, 2015). Factors such as the loss of quality of some materials during recycling (Cullen, 2017) and environmental contamination make it difficult to close loops (Baxter et al., 2017).

Economic challenges include high start-up costs, capital requirements and the quality and price volatility of secondary materials. Implementing circular business models can require more investment than traditional linear models, making it difficult for businesses to transition to circular practices (Linder and Williander, 2017; Babbitt et al., 2018).

Institutional and regulatory challenges are associated with a lack of appropriate legal frameworks and policy inconsistencies (Kirchherr et al., 2018). While existing regulations often support the linear economy model, they fail to promote the systematic changes needed for circular practices. Moreover, the uncertainty of system boundaries and governance issues hinder the diffusion of practices (Inigo and Blok, 2019).

Social and cultural challenges stem from the rigidity of consumer behavior, low circular economy awareness, and resistance to change in business routines. Consumers' reluctance to shift from ownership to usage-oriented models makes circular economy adoption difficult. Moreover, the reluctance of businesses to change their existing business models limits the spread of circular practices (Hobson, 2020; Pieroni et al., 2020).

The relationship between sustainability and circular economy concepts raises the question of how organizations can benefit from circular economy principles in achieving their sustainability goals. In this context, how organizations address the relationship between circular economy and sustainability, how the integration of these two concepts is reflected in organizational structures and processes, and the impact of this integration on organizational performance have become a growing topic of interest in the literature.

2.3. Integration of Sustainability and Circular Economy in Organizational Context

The confluence of circular economy and corporate sustainability involves varied dimensions, including economic, ecological, social, and technology aspects. The application of circular economy practices is expected to have far-reaching implications for the economy globally. Projections place the economic contribution at 4.5 trillion dollars by 2030 and 25 trillion dollars by 2050 (Lacy and Rutqvist, 2015). These practices improve production efficiency (de Sousa Jabbour et al., 2018) by limiting material costs (Kalmykova et al., 2018).

Khan and Qianli (2017) confirmed the positive relationship between environmentally friendly supply chain processes and firm profitability and environmental sustainability. However, Cousins et al. (2019) state that green practices can negatively affect financial performance by increasing material costs.

On the environmental dimension, the Circle Economy (2019) report indicates that global greenhouse gas emissions can be reduced by 63 percent by 2050 through low-carbon strategies. Circular economy principles reduce environmental impacts through resource conservation and recycling in production processes (Rosa et al., 2019). Kouhizadeh et al. (2019) state that the integration of blockchain technologies into circular economy practices improves production efficiency through the renewal of resources and recycling of materials.

In relation to society, circular economy presents benefits in quality of life and in creating jobs (Kalmykova et al., 2018; Mathews and Tan, 2016). However, Kirchherr et al. (2017) report that only 12 percent of circular economy definitions include sustainable development. Velenturf and Purnell (2021) noted that fewer than 1 percent of research articles discuss key aspects of sustainable development, including equity, values, and participation.

As for technology, Khan et al. (2021) state that Industry 4.0 essentially changes practices related to circular economy. The advanced technology boosts productivity and flexibility (Durach et al., 2021; Kouhizadeh et al., 2021). Blockchain technology is highly promising in the context of circular economy as it is based on characteristics like reliability, transparency, and smart

execution (Kouhizadeh et al., 2019). Moreover, blockchain presents immutable information about provenance, energy usage, and lifecycle stages of materials (Hou et al., 2020; Rekha and Resmi, 2021).

The corporate integration of sustainability and circular economy principles faces several challenges in conceptual, operational and cultural dimensions. Sustainable development and circular economy are not easily linked since they are not closely related conceptually. Velenturf and Purnell (2021) state that circular economy lacks a solid concept and can be only loosely associated with sustainable development. As a result, organizations may engage in practices that are unsustainable.

Korhonen et al. (2018b) argue that the circular economy is not simply about adding reverse material flows to the economy. Reike et al. (2018) distinguish between reformist circular economists who adopt current approaches and transformative economists who advocate for radical changes in the political-economy for sustainable development.

At the operational level, resource constraints pose significant barriers, especially for small and medium enterprises. Poor information and communication technology infrastructure and unskilled human capital create obstacles to adopting advanced technologies (Khan et al., 2021). García-Quevedo et al. (2020) state that regulatory barriers and lack of human resources make it difficult for SMEs to adopt the circular economy. Kirchherr et al. (2018) assert that businesses are not yet prepared for circular products and thus move slowly when making required investments.

According to Cousins et al. (2019), sustainable practices could affect financial performance negatively as raw material prices rise, while simultaneously improving ecological sustainability. On the cultural dimension, integration requires fundamental change. Wiedmann et al. (2020), Seyfang (2009) and Kates et al. (2001) argue that technological solutions alone are not enough. A change in social values is necessary for meaningful transformation.

The corporate integration of sustainability and circular economy principles offers significant opportunities in economic, environmental, social and technological dimensions. On the economic dimension, circular economy practices have the potential for a global economic contribution of 4.5 trillion dollars by 2030 and 25 trillion dollars by 2050 (Lacy and Rutqvist, 2015). Roy and Khastagir (2016) found that these practices increase competitiveness by creating financial and environmental advantages in the supply chain.

Rosa et al. (2019) state that circular economy principles reduce environmental impacts through resource conservation and recycling in production processes. Morais and Silvestre (2018) demonstrate that circular design reduces production residues, resource dependency and energy consumption. Brydges (2021) shows that environmental protection is achieved by reducing system waste and increasing efficiency.

On the social dimension, integration provides benefits such as improving quality of life and creating new job opportunities (Kalmykova et al., 2018; Mathews and Tan, 2016). Razzaq et al. (2021) identify employment opportunities created in the waste management sector. Morais and Silvestre (2018) and Walker et al. (2021) document increases in employee health and safety and social welfare.

Kouhizadeh et al. (2019) state that blockchain technology has significant potential in the circular economy with its reliability, transparency and smart execution capacities. Narayan and Tidstrom (2019) characterize Industry 4.0 as a game changer revolutionizing the circular economy that can eliminate waste from the supply chain.

Recent scholarship has begun addressing the social dimension gap in circular economy research, though this work remains nascent compared to environmental and economic analyses. Padilla-Rivera et al. (2020) developed comprehensive frameworks for social sustainability assessment in circular economy contexts, emphasizing the need to evaluate impacts on working conditions, community well-being, and stakeholder equity. Research examining employment implications reveals complex dynamics, with circular economy transitions potentially creating new job opportunities in waste management, repair, and remanufacturing sectors while disrupting employment in traditional linear industries (Stahel, 2016). Studies of just transition frameworks in circular economy contexts emphasize the importance of addressing distributional consequences and ensuring that circular economy benefits reach diverse stakeholder groups rather than concentrating among already-advantaged populations (Schröder et al., 2020). Gender dimensions of circular economy have received limited attention, though emerging work suggests that circular practices may have differentiated impacts on women and men based on sectoral employment patterns and informal economy participation (Jaeger-Erben et al., 2021). Understanding these social dimensions requires methodological approaches capable of capturing both positive outcomes and potential negative consequences, including displacement effects, skill mismatches, and power asymmetries in circular value chains.

3. METHODOLOGICAL APPROACH

This study employs a comprehensive bibliometric analysis to systematically examine the intellectual structure and evolution of research connecting circular economy principles and organizational sustainability. Bibliometric analysis offers a robust quantitative approach to mapping scientific literature, identifying influential works, detecting emerging research trends, and revealing knowledge gaps in a field. This methodology is particularly valuable for analyzing the development of interdisciplinary research areas such as the integration of circular economy and organizational sustainability.

This methodology enables theoretical advancement by revealing patterns, structures, and relationships across large bodies of literature that remain invisible through traditional narrative reviews, thereby generating new conceptual insights about how fields develop and cohere intellectually.

3.1. Data Collection

3.1.1. Database Selection

We selected Scopus as our primary data source due to its comprehensive coverage of peer-reviewed literature across various disciplines, stringent indexing criteria, and extensive metadata that facilitates bibliometric analysis. Scopus covers a broader range of journals compared to other databases such as Web of Science, particularly in the fields of business, management, and environmental science, which are central to our research topic.

While Scopus provides extensive coverage suitable for bibliometric analysis, we acknowledge that our database selection creates inherent boundaries around our findings. Publications appearing in regional journals without Scopus coverage, institutional repositories, books not indexed in Scopus, or materials in languages other than English fall outside our analytical scope. This limitation is particularly relevant for research from developing and emerging economies, where relevant scholarship may exist in locally focused publications not represented in international databases. This limitation is particularly salient for understanding circular economy and organizational sustainability research in contexts such as Turkey and other emerging economies, where active research communities may publish in regional journals, local languages, or through institutional channels outside international database coverage. Scholarship addressing context-specific implementation challenges, institutional adaptations, cultural factors, and SME-oriented circular strategies in these settings may not be captured in our analysis, potentially underrepresenting important regional perspectives on organizational sustainability transitions in diverse economic and institutional environments. Our findings therefore reflect the intellectual structure of circular economy and organizational sustainability research as manifested within the Scopus-indexed literature rather than making definitive claims about the totality of research activity in this field globally. This methodological transparency is essential for appropriate interpretation of our results and their implications.

3.1.2. Search Strategy

The search strategy was designed to capture relevant publications at the intersection of circular economy and organizational sustainability. After several iterations to refine the search terms, we used the following search string:

TITLE-ABS-KEY ("circular economy" OR "circularity" OR "circular business model*" OR "circular value chain*") AND TITLE-ABS-KEY ("organi?ational sustainability" OR "corporate sustainability" OR "business sustainability" OR "sustainable organi?ation*" OR "sustainable business" OR "sustainable enterprise*" OR "triple bottom line")

This search was limited to peer-reviewed journal articles, conference papers, and book chapters in English published until April 2025, yielding an initial dataset of 479 documents.

3.1.3. Filtering and Refinement

The initial dataset was refined through a systematic screening process, following the PRISMA guidelines for systematic reviews. Documents were screened first by title and abstract, then by full text, to ensure relevance to both circular economy principles and organizational sustainability. After removing duplicates and irrelevant publications, the final dataset comprised 411 documents.

3.2. Bibliometric Analysis Techniques

3.2.1. Performance Analysis

Performance analysis was conducted to identify the most influential publications, authors, institutions, and countries in the field. Indicators used included:

- Publication count and temporal distribution
- Citation analysis (total citations, average citations per publication)
- Journal impact metrics (CiteScore, SJR, SNIP)
- Author and institutional productivity and impact
- Geographic distribution of research

3.2.2. Science Mapping

Science mapping techniques were employed to visualize and analyze the intellectual structure and evolution of the field:

- **Co-citation analysis** was performed to identify intellectual foundations and schools of thought, revealing how cited references cluster together to form the theoretical basis of the field.
- **Bibliographic coupling** was used to identify current research fronts and emerging trends by analyzing similarities in the reference lists of the documents in our dataset.
- **Co-word analysis** based on keywords and terms extracted from titles and abstracts revealed the conceptual structure of the field and the evolution of key themes over time.
- **Co-authorship analysis** examined collaboration patterns among authors, institutions, and countries to reveal the social structure of the research community.

3.3. Analytical Tools

Several specialized software tools were utilized in this analysis:

- **VOSviewer** (version 1.6.19) for constructing and visualizing bibliometric networks, including co-citation, bibliographic coupling, co-authorship, and co-occurrence networks.
- **Bibliometrix R-package** (version 4.1) for comprehensive bibliometric analysis, including performance analysis and science mapping.

- **CiteSpace** (version 6.1.0) for detecting and visualizing emerging trends and critical transitions in the literature over time.
- **NVivo** (version 14) for qualitative content analysis of the most influential papers to extract key themes, theoretical frameworks, and practical implications.

3.4. Analytical Framework

To guide our analysis and interpretation, we developed an analytical framework that integrates quantitative bibliometric measures with qualitative assessment of content. This framework consists of four key dimensions:

- **Temporal evolution**: Analyzing how research on circular economy and organizational sustainability has developed over time, identifying key milestones and turning points.
- **Intellectual foundations**: Identifying the theoretical roots and conceptual underpinnings of research at the intersection of circular economy and organizational sustainability.
- **Thematic structure**: Mapping key research themes, concepts, and their interrelationships to understand the conceptual landscape of the field.
- **Research impact and diffusion**: Examining how knowledge flows within the field and its influence on related disciplines and practices.

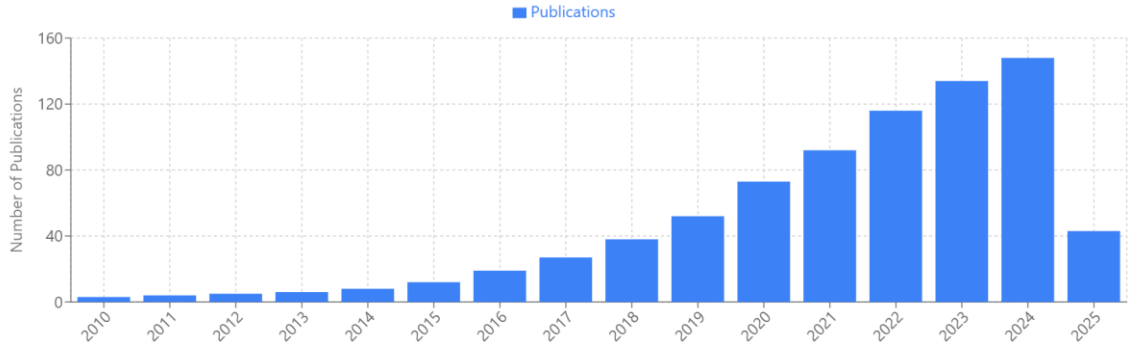
4. RESULTS

This section presents the findings of the bibliometric performance analysis and explores the temporal evolution of publications, influential journals, authors, institutions, and countries that contribute to research on circular economies and organisational sustainability.

4.1. Publication Trends and Temporal Evolution

The analysis of publication trends reveals a significant growth in research integrating circular economy principles and organizational sustainability. Figure 1 illustrates the annual scientific production from 2010 to early 2025, showing exponential growth starting around 2016, which coincides with the European Union's adoption of the Circular Economy Action Plan in 2015.

Figure 1. Annual scientific production on circular economy and organizational sustainability (2010-2025)



From 2010 to 2015, publications remained relatively scarce (less than 10 papers annually), indicating the nascent stage of this research area. The period from 2016 to 2020 saw a steady increase, with the number of publications growing by approximately 40% year-over-year. A substantial acceleration occurred between 2021 and 2025, with annual publications more than doubling compared to the previous period. This dramatic increase reflects the growing importance of circular economy principles in addressing organizational sustainability challenges amid intensifying climate concerns and resource scarcity issues.

The annual growth rate of 32.7% over the past decade significantly exceeds the average growth rate of scientific literature in management and environmental sciences (approximately 8-10%), highlighting the emerging nature and increasing relevance of this research area.

4.2. Journal Analysis

4.2.1. Most Productive Journals

Table 1 presents the top 10 journals publishing research on the integration of circular economy principles and organizational sustainability. The analysis reveals a concentration of publications in sustainability-focused and business strategy journals.

Table 1. Top 10 most productive journals

Rank	Journal	Publications	% of Total	CiteScore (2024)	Subject Category
1	Business Strategy and the Environment	57	13.9%	11.2	Business; Environmental Science
2	Journal of Cleaner Production	51	12.4%	13.5	Environmental Science; Engineering
3	Sustainability	43	10.5%	5.8	Environmental Science; Social Sciences
4	Resources, Conservation and Recycling	26	6.3%	15.7	Waste Management; Environmental Science
5	Journal of Industrial Ecology	24	5.8%	10.3	Environmental Science; Industrial Ecology
6	International Journal of Production Economics	16	3.9%	12.4	Operations Research; Economics
7	Ecological Economics	14	3.4%	9.1	Economics; Environmental Science
8	Production Planning & Control	11	2.7%	7.8	Operations Management
9	Sustainable Production and Consumption	10	2.4%	11.2	Sustainability; Production
10	Corporate Social Responsibility and Environmental Management	9	2.2%	8.9	Business; Environmental Management

The dominance of "Business Strategy and the Environment" and "Journal of Cleaner Production" highlights the interdisciplinary nature of the research field, bridging business strategy with environmental considerations. Together, these two journals account for over a quarter of all publications in the dataset, suggesting their pivotal role in shaping discourse on integrating circular economy principles into organizational sustainability frameworks.

4.2.2. Journal Citation Impact

Analysis of citation impact reveals that publications in "Resources, Conservation and Recycling" receive the highest average citations per paper (32.4), followed by "Journal of Cleaner Production" (28.7) and "Journal of Industrial Ecology" (26.3). This suggests that while "Business Strategy and the Environment" publishes the most papers in this field, research published in resources and production-focused journals tends to have higher citation impact, possibly due to their technical and practical orientation.

4.3. Author Analysis

4.3.1. Most Productive Authors

Table 2 presents the top 10 most productive authors in the field, based on the number of publications related to circular economy and organizational sustainability.

Table 2. Top 10 most productive authors

Rank	Author	Publications	h-index	Institution	Country
1	Bocken, N. M. P.	17	69	Maastricht University	Netherlands
2	Geissdoerfer, M.	11	34	University of Cambridge	United Kingdom
3	Kirchherr, J.	10	42	Utrecht University	Netherlands
4	Govindan, K.	9	105	University of Southern Denmark	Denmark
5	Jabbour, C. J. C.	9	73	University of Lincoln	United Kingdom
6	Evans, S.	8	51	University of Cambridge	United Kingdom
7	Masi, D.	8	28	University of Warwick	United Kingdom
8	Sousa-Zomer, T.T.	7	22	Universidade Federal de Santa Catarina	Brazil
9	Kumar, V.	7	47	University of Birmingham	United Kingdom
10	Seuring, S.	7	76	University of Kassel	Germany

Nancy Bocken emerges as the most prolific author with 17 publications, followed by Martin Geissdoerfer and Julian Kirchherr. These authors have played pivotal roles in conceptualizing circular business models and identifying barriers to circular economy implementation. The

presence of researchers from various European institutions reflects Europe's leadership in circular economy research and policy development.

4.3.2. Co-authorship Networks

Analysis of co-authorship patterns reveals several distinct collaborative clusters centered around key researchers. The most notable cluster connects Bocken, Geissdoerfer, and Evans at the core of circular business model research. Another significant cluster forms around Govindan, focusing on supply chain applications of circular economy principles. These collaborative networks suggest a relatively cohesive research community with strong international connections, primarily centered in Europe.

4.4. Institutional and Country Contributions

4.4.1. Leading Institutions

The analysis identified 289 institutions contributing to research on circular economy and organizational sustainability. Table 3 presents the top 10 most productive institutions. The institutional rankings presented here reflect productivity within Scopus-indexed venues, recognizing that research output in non-indexed regional journals or institutional publications would alter these patterns.

Table 3. Top 10 most productive institutions

Rank	Institution	Publications	Citations	Country
1	Delft University of Technology	28	3,216	Netherlands
2	University of Cambridge	22	4,153	United Kingdom
3	Utrecht University	18	2,845	Netherlands
4	Lund University	16	1,987	Sweden
5	Politecnico di Milano	15	1,433	Italy
6	University of São Paulo	13	785	Brazil
7	University of Manchester	13	1,215	United Kingdom
8	Aalborg University	12	954	Denmark
9	Technical University of Denmark	11	1,376	Denmark
10	University of Sheffield	10	789	United Kingdom

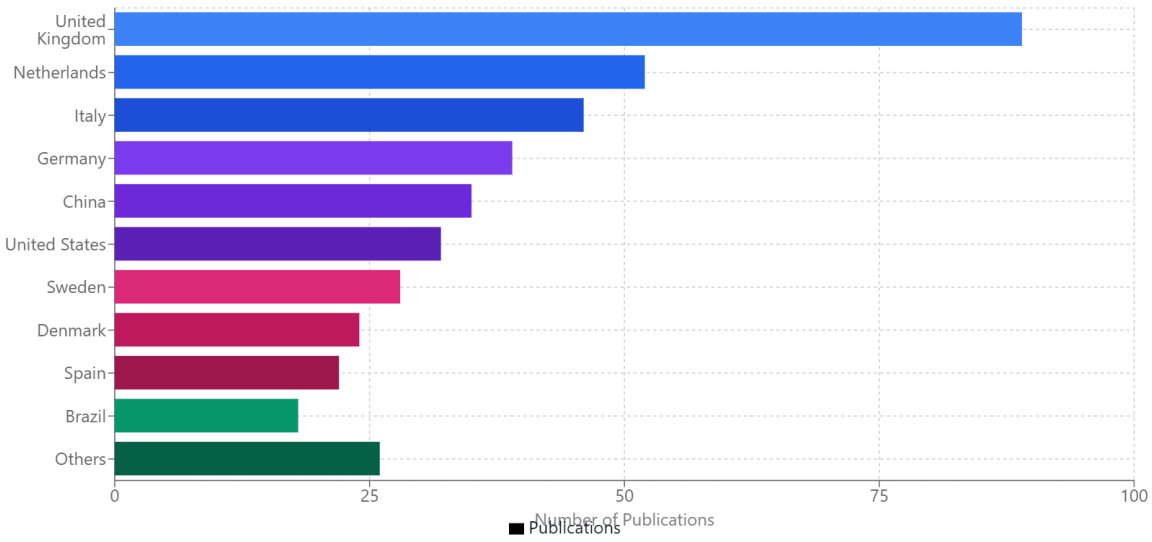
European institutions dominate the research landscape, with Dutch and British universities showing particular strength. Delft University of Technology and the University of Cambridge emerge as the leading institutions, reflecting their sustained commitment to circular economy research. The University of São Paulo's presence in the top 10 indicates growing contributions from emerging economies.

4.4.2. Country Analysis

Figure 2 presents the geographical distribution of research output by country. The analysis reveals that 67 countries have contributed to research in this field, with significant concentration

in a few regions. These geographic patterns reflect both actual research concentration and the indexing patterns of the Scopus database, which may underrepresent scholarship from regions where locally focused journals operate outside international database coverage.

Figure 2. Geographical distribution of research output by country



The United Kingdom leads with 89 publications (21.7% of the total), followed by the Netherlands (52 publications, 12.7%), Italy (46 publications, 11.2%), and Germany (39 publications, 9.5%). These four European countries account for more than half of all publications, underscoring Europe's leadership in circular economy research and policy.

Outside Europe, China (35 publications, 8.5%), the United States (32 publications, 7.8%), and Brazil (18 publications, 4.4%) are the most significant contributors. The relatively limited contribution from the United States compared to European countries highlights regional differences in prioritizing circular economy research.

Analysis of international collaboration reveals that papers with authors from multiple countries receive on average 34% more citations than single-country papers, emphasizing the value of international collaboration in this field. The most productive collaborative links exist between the Netherlands and the United Kingdom (23 joint publications), followed by Italy and the United Kingdom (19 joint publications).

4.5. Citation Analysis

4.5.1. Most Cited Publications

Table 4 presents the ten most influential publications based on citation counts, highlighting foundational work in the integration of circular economy principles and organisational sustainability.

Table 4. Top 10 most cited publications

Rank	Authors	Title	Year	Journal	Citations	Citations per Year
1	Geissdoerfer et al.	The Circular Economy – A new sustainability paradigm?	2017	Journal of Cleaner Production	2,843	406.1
2	Kirchherr et al.	Conceptualizing the circular economy: An analysis of 114 definitions	2017	Resources, Conservation and Recycling	2,387	341.0
3	Bocken et al.	Product design and business model strategies for a circular economy	2016	Journal of Industrial and Production Engineering	1,968	246.0
4	Murray et al.	The Circular Economy: An interdisciplinary exploration of the concept and application in a global context	2017	Journal of Business Ethics	1,276	182.3
5	Ghisellini et al.	A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems	2016	Journal of Cleaner Production	1,245	155.6
6	Korhonen et al.	Circular economy as an essentially contested concept	2018a	Journal of Cleaner Production	891	148.5
7	Lieder and Rashid	Towards circular economy implementation: A comprehensive review in context of manufacturing industry	2016	Journal of Cleaner Production	862	107.8
8	Pieroni et al.	Business model innovation for circular economy and sustainability: A review of approaches	2019	Journal of Cleaner Production	629	125.8
9	Geissdoerfer et al.	Business models and supply chains for the circular economy	2018	Journal of Cleaner Production	574	95.7
10	Lüdeke-Freund et al.	A review and typology of circular economy business model patterns	2019	Journal of Industrial Ecology	482	96.4

Geissdoerfer et al.'s (2017) conceptual paper establishing circular economy as a new sustainability paradigm has received the highest number of citations, highlighting its

foundational role in connecting these concepts. Kirchherr et al.'s (2017) comprehensive analysis of circular economy definitions has also been highly influential in establishing conceptual clarity in the field. The high citation counts for review papers (7 of the top 10) indicate that the field is still in a conceptual development stage, with researchers seeking to establish theoretical frameworks and synthesize existing knowledge.

4.5.2. Citation Network Analysis

Analysis of citation networks reveals three major citation clusters:

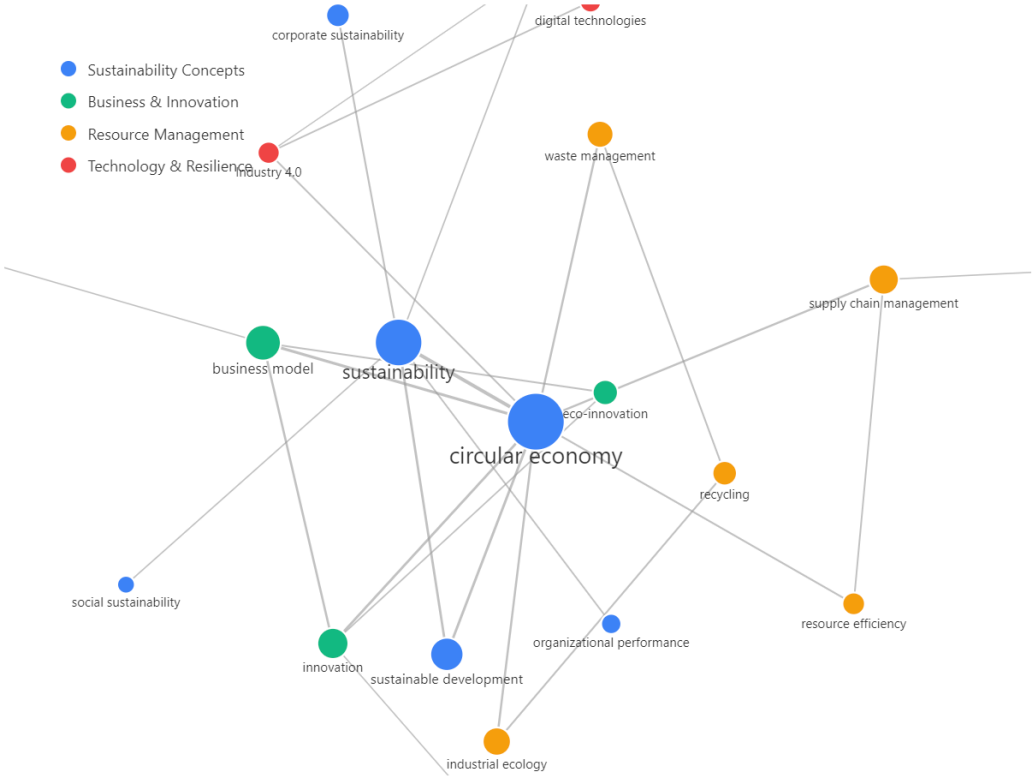
- **Conceptual foundations** (centered around Geissdoerfer et al., 2017; Kirchherr et al., 2017): This cluster focuses on defining and conceptualizing circular economy in relation to sustainability paradigms.
- **Business model innovation** (centered around Bocken et al., 2016; Pieroni et al., 2019): This cluster explores how business models can be redesigned to incorporate circular economy principles.
- **Implementation and barriers** (centered around Korhonen et al., 2018a): This cluster examines practical challenges and strategies for implementing circular economy principles in organizational contexts.

These citation clusters reflect the major research streams in the field and illustrate how knowledge has developed from conceptual foundations towards implementation challenges.

4.6. Keyword Analysis

Analysis of keywords reveals the conceptual landscape of the research field. Figure 3 shows the co-occurrence network of author keywords, with node size reflecting frequency and links representing co-occurrence strength. The most frequent keywords are "circular economy" (appearing in 85.4% of publications), "sustainability" (57.8%), "business model" (32.6%), "sustainable development" (28.3%), and "innovation" (24.9%).

Figure 3. Co-occurrence network of author keywords



Temporal analysis of keywords reveals an evolution in research focus. Early publications (2010-2016) emphasized concepts like "industrial ecology," "cleaner production," and "waste management," reflecting the roots of circular economy in these established fields. During 2017-2020, "business models," "innovation," and "supply chain management" gained prominence, indicating a shift toward organizational implementation. The most recent period (2021-2025) shows increasing focus on "digital technologies," "Industry 4.0," "resilience," and "social sustainability," suggesting broadening research perspectives. This evolution reflects the field's maturation from conceptual foundations toward practical implementation challenges and the integration of emerging technologies to enable circular business models.

5. THEMATIC DISCUSSION

We discuss five major themes that represent the core intellectual structure of the field, highlighting theoretical developments, practical applications, and emerging research directions within each theme.

Our identification of five major thematic areas shows both convergence and complementarity with previous bibliometric analyses in adjacent domains. Previous bibliometric research focused specifically on circular economy business models has identified research clusters around business model innovation, sustainability transitions, and value creation mechanisms. These patterns align substantially with our second thematic area concerning circular business

models and value creation. This alignment across multiple bibliometric studies suggests robust consensus within the research community regarding the centrality of business model innovation to circular economy implementation.

5.1. Conceptual Integration of Circular Economy and Sustainability Paradigms

One of the most prominent themes in the literature involves efforts to conceptually integrate circular economy principles with broader sustainability paradigms. This body of research addresses fundamental questions about whether circular economy represents a new sustainability paradigm or a complementary approach to existing sustainability frameworks.

Geissdoerfer et al. (2017) provided one of the first comprehensive comparisons between circular economy and sustainability concepts, identifying both similarities and differences. This view has been influential, with subsequent research building on this conceptualization to explore more nuanced relationships (Schroeder et al., 2019; Suárez-Eiroa et al., 2019).

Kirchherr et al. (2017) analyzed 114 definitions of circular economy, finding that while most definitions emphasized economic and environmental dimensions, only 12% incorporated broader sustainable development aspects. Similarly, Korhonen et al. (2018a) argued that circular economy is an 'essentially contested concept' with varying interpretations, which creates both challenges and opportunities for its application in sustainability contexts.

More recent research by Velenturf and Purnell (2021) highlighted that while circular economy and sustainable development share many common principles, they are often disconnected in practice. Their work establishes principles for a sustainable circular economy that explicitly bridge these concepts, focusing on resource conservation, waste reduction, and social well-being.

The literature reveals evolving perspectives on this relationship, from early views of circular economy as primarily an environmental approach to more recent integrative frameworks that encompass the triple bottom line. However, the social dimension remains relatively underdeveloped in circular economy research (Padilla-Rivera et al., 2020), representing an important area for future development.

5.2. Circular Business Models and Value Creation

A second major theme focusses on how organisations are redesigning their business models to integrate circular economy principles and generate sustainable value. Bocken et al. (2016) provided an influential framework categorizing product design and business model strategies for a circular economy, including slowing, closing, and narrowing resource loops. Building on this work, Lüdeke-Freund et al. (2019) developed a comprehensive typology of circular business model patterns, identifying six major categories: repair and maintenance, reuse and redistribution, refurbishment and remanufacturing, recycling, cascading and repurposing, and organic feedstock management.

Empirical research by Pieroni et al. (2019) examined how companies implement these strategies in practice, revealing that most organizations adopt incremental rather than radical business model innovations, often focusing on recycling and resource efficiency rather than more transformative approaches. Subsequent work by Geissdoerfer et al. (2017) expanded the understanding of circular business models, highlighting their systems perspective and the importance of orchestrating multiple stakeholders across value networks.

5.3. Supply Chain and Operations Management for Circularity

A third significant theme addresses how circular economy principles transform supply chain design and operations management. This research stream examines the extension of sustainable supply chain management to incorporate circular material flows, new collaborative relationships, and innovative operational practices. De Angelis et al. (2018) articulated a framework for circular supply chains, distinguishing them from traditional linear and sustainable supply chains through their focus on closed-loop material flows, product recovery, and extended producer responsibility. This conceptual foundation has informed subsequent empirical research on circular supply chain practices.

Research by Geissdoerfer et al. (2017) highlighted the importance of inter-organizational collaboration in circular supply chains, demonstrating how network relationships and governance mechanisms enable material recovery and resource sharing. These studies emphasize that circularity often extends beyond organizational boundaries, requiring new forms of collaboration with suppliers, customers, and even competitors. These studies highlight how technologies such as IoT sensors, blockchain, and advanced analytics facilitate product tracking, quality assurance in recovered materials, and optimization of reverse logistics.

Recent research has increasingly addressed the challenges of implementing circular practices in global supply chains. Kazancoglu et al. (2021) explored how governance mechanisms and policy interventions can overcome these challenges, suggesting approaches for transitioning toward more circular supply networks. The interplay between resilience and circularity in supply chains has emerged as an important research focus, particularly following global disruptions such as the COVID-19 pandemic.

5.4. Organizational Transformation and Change Management

The fourth key theme examines how organizations manage the transition toward circular practices, focusing on organizational change processes, capabilities, leadership, and cultural factors that enable successful implementation of circular economy principles.

Research by Khan et al. (2021) has identified dynamic capabilities that organizations need to develop for successful circular economy implementation, including resource reconfiguration abilities, sensing and seizing circularity opportunities, and orchestrating collaborative networks. These capabilities allow organizations to overcome path dependencies associated with linear business practices.

Research on organizational transformation for circularity has increasingly recognized the importance of addressing systemic barriers. Kirchherr et al. (2018) identified categories of barriers at individual, organizational, value chain, and institutional levels, emphasizing the need for multi-level change strategies. This recognition of nested systems has led to more holistic approaches to transformation that consider both organizational and contextual factors.

5.5. Performance Measurement and Impact Assessment

The fifth major theme focuses on how organisations measure and evaluate the effects of implementing circular economy on sustainable performance. This research stream develops frameworks, indicators, and assessment methods that capture the multidimensional effects of circular practices.

Early research by Ghisellini et al. (2016) identified the need for comprehensive measurement frameworks. These frameworks must go beyond traditional economic metrics to include environmental and social dimensions. The studies called for the development of integrated performance metrics that could track progress along the circular economy journey.

Research on the financial implications of circular economy implementation has yielded mixed results. Demirel and Danisman (2019) found positive relationships between eco-innovation for circularity and firm growth in European SMEs. Cousins et al. (2019) highlighted potential short-term financial challenges associated with transitioning to circular practices. These nuanced findings suggest that financial outcomes may depend on contextual factors, implementation approaches, and time horizons.

6. CONCLUSION

This comprehensive bibliometric analysis has examined the evolving relationship between circular economy principles and organizational sustainability. We have mapped the intellectual structure and development of this interdisciplinary field through systematic analysis of 411 publications from the Scopus database. Through performance analysis and science mapping, we have identified key research streams, influential contributions, and emerging trends that characterize this rapidly growing area of inquiry.

While our findings illuminate important patterns in the research landscape, readers should interpret these results within the scope of our methodological approach. The Scopus database, while offering comprehensive coverage of peer-reviewed literature across multiple disciplines, represents a defined corpus rather than the totality of scholarly work on this topic. Publications in regional journals, non-indexed venues, or alternative databases fall outside our analytical scope. Consequently, our findings reflect the intellectual structure of circular economy and organizational sustainability research as represented within this particular database ecosystem. This section summarizes the main findings of our analysis, discusses their theoretical and practical implications, and outlines promising directions for future research.

6.1. Summary of Key Findings

The intellectual landscape of this field is characterized by five major thematic areas: (1) conceptual integration of circular economy and sustainability paradigms, (2) circular business models and value creation, (3) supply chain and operations management for circularity, (4) organizational transformation and change management, and (5) performance measurement and impact assessment. These themes represent the core intellectual structure of the field and provide a framework for understanding how research has evolved.

European institutions, particularly those in the United Kingdom, Netherlands, Italy, and Scandinavian countries, have dominated research in this area, reflecting Europe's leadership in circular economy policy and implementation. However, contributions from China, the United States, and emerging economies like Brazil indicate the global relevance of this research agenda.

The field demonstrates a clear evolution from conceptual foundations toward more implementation-focused research. Early studies (2010-2016) concentrated on defining and conceptualizing circular economy in relation to sustainability paradigms, drawing on established fields like industrial ecology and cleaner production. More recent research (2017-2025) has increasingly addressed practical implementation challenges, organizational transformation processes, and performance outcomes.

Our analysis also reveals that while environmental and economic dimensions of circularity have received substantial attention, the social dimension remains relatively underdeveloped. This gap represents both a limitation of current research and an opportunity for future development of more holistic approaches that fully embrace the triple bottom line of sustainability.

6.2. Theoretical Contributions

Beyond mapping publication trends and citation patterns, this bibliometric analysis generates theoretical insights through pattern recognition and structural revelation that individual studies cannot provide. By systematically identifying how 411 studies cluster into five coherent thematic areas, our analysis reveals an emergent intellectual architecture showing how scholars implicitly organize their understanding of circular economy and organizational sustainability integration. This pattern recognition enables new theoretical synthesis demonstrating that despite diverse research approaches and disciplinary origins, the field exhibits conceptual coherence around identifiable theoretical structures. Furthermore, our temporal analysis reveals not simply increasing publication volume but a fundamental theoretical maturation whereby the field transitioned from definitional debates toward pragmatic implementation frameworks, suggesting intellectual consolidation around core principles. This evolution trajectory has theoretical implications for understanding how interdisciplinary fields achieve intellectual coherence and progress from conceptual fragmentation toward shared theoretical foundations. Our systematic documentation of social dimension underdevelopment across multiple

analytical approaches provides empirical foundation for theoretical claims about circular economy's conceptual boundaries, enabling more sophisticated theorizing about what circular economy frameworks include and exclude as sustainability approaches. These insights represent theoretical advancement through bibliometric pattern analysis rather than simple documentation of existing scholarship.

This bibliometric analysis makes several theoretical contributions to the understanding of circular economy and organizational sustainability. First, it clarifies the intellectual foundations of this interdisciplinary field, showing how it draws from and extends diverse theoretical traditions including industrial ecology, sustainable supply chain management, innovation studies, organizational change theory, and performance management. Second, our analysis uncovers the developing relationship between the concepts of circular economy and sustainability. The field has moved from early conceptualizations of circular economy as primarily an environmental or resource efficiency approach toward more integrated frameworks that recognize its contributions to broader sustainable development goals. However, debates continue about whether circular economy represents a new sustainability paradigm or a complementary approach to existing sustainability frameworks. Third, our findings highlight the multi-level nature of circular economy implementation, spanning individual, organizational, value chain, and institutional levels. This recognition has led to more sophisticated theoretical frameworks that consider how factors at different levels interact and influence circular economy adoption and outcomes. Finally, our analysis identifies emerging theoretical connections between circular economy and organizational resilience. Research increasingly suggests that circular practices may enhance organizational adaptability and resource security in uncertain environments, pointing to potential synergies between circularity and resilience that warrant further theoretical development.

6.3. Practical Implications

For practitioners and organizations seeking to implement circular economy principles, this analysis offers several valuable insights. First, it highlights the importance of holistic approaches that address not only technical and operational aspects but also organizational culture, leadership, capabilities, and stakeholder engagement. Successful implementation requires attention to both "hard" and "soft" factors that enable organizational transformation.

Second, our findings emphasize the role of business model innovation in circular economy implementation. Organizations seeking to become more circular need to fundamentally rethink how they create, deliver, and capture value, moving beyond incremental improvements in resource efficiency toward more transformative approaches that close material loops and create shared value. Third, the analysis underscores the importance of collaborative approaches that extend beyond organizational boundaries. Circular economy implementation often requires new forms of cooperation with suppliers, customers, competitors, and other stakeholders to create closed-loop systems and shared infrastructure for material recovery and reuse. Fourth,

our findings highlight the potential role of digital technologies in enabling circular practices. Finally, the analysis suggests that measuring and communicating circular economy performance requires comprehensive approaches that go beyond traditional metrics to capture multiple dimensions of value creation. Organizations need to develop integrated measurement frameworks that track progress across economic, environmental, and social dimensions of performance.

6.4. Limitations of Current Research

Despite significant advances in understanding the relationship between circular economy principles and organisational sustainability, our analysis reveals several limitations in the current body of research that warrant careful interpretation.

First, there is a geographic imbalance in the research contributions identified through our Scopus-based analysis. European institutions dominate the field. While this pattern reflects Europe's leadership in circular economy policy and the strong representation of European journals in the Scopus database, it also reveals a methodological limitation of our study. The concentration of European research in our dataset may reflect both the actual research landscape and the indexing patterns of Scopus itself.

Research from developing and emerging economies may exist in regional journals, institutional repositories, or publications outside the Scopus indexing scope. Consequently, the geographic diversity in circular economy and organizational sustainability research may be greater than our analysis reveals. Nevertheless, the pattern we observe underscores the need for greater international collaboration and knowledge exchange. This collaboration is particularly important for understanding how circular economy principles are adapted and implemented in diverse institutional, cultural, and economic contexts beyond the European Union framework.

Second, methodological limitations are evident in the prevalence of qualitative case studies and conceptual works. Relatively fewer quantitative and mixed-methods studies appear in the literature. While case studies provide valuable insights into implementation processes, larger-scale quantitative studies would enhance understanding of patterns, relationships, and outcomes across diverse organizational contexts. The development of robust datasets that enable comparative analysis across industries, organizational types, and geographic regions would significantly advance the field.

Third, limited longitudinal research examines the long-term impacts of circular economy implementation on organizational sustainability performance. Most studies provide snapshot views rather than tracking how circular practices evolve and influence performance over extended periods. This temporal limitation restricts understanding of how organizations navigate the transition journey, overcome initial barriers, and realize benefits over time. Longitudinal research designs would illuminate the dynamic processes of organizational change and the sustainability of circular economy initiatives.

Fourth, social dimensions of circular economy remain underexplored compared to environmental and economic dimensions. Limited attention has been given to social impacts, equity considerations, labor implications, and community effects of circular economy implementation. This gap restricts understanding of how circular practices contribute to holistic sustainability objectives encompassing the full triple bottom line. The relative neglect of social dimensions may reflect both the environmental origins of circular economy discourse and the inherent challenges of measuring social outcomes.

Finally, more interdisciplinary research is needed to bridge traditional disciplinary boundaries. While our analysis reveals contributions from business, environmental science, engineering, and economics, deeper integration across these disciplines would strengthen both theoretical development and practical applications. Interdisciplinary collaboration could address complex questions about system-level transformations, socio-technical transitions, and the governance of circular economies. These questions cannot be adequately addressed within single disciplinary frameworks.

6.5. Future Research Directions

Future research should expand geographic coverage to include more studies from diverse regions, particularly developing and emerging economies. These contexts may present unique challenges and opportunities for circular economy implementation. Such contexts include informal waste management systems, different regulatory environments, and distinct cultural attitudes toward materials and consumption. Comparative studies examining how circular economy principles are adapted and implemented across different national and cultural contexts would be particularly valuable.

Particular attention should be directed toward understanding circular economy and organizational sustainability integration in Turkish and broader Middle Eastern contexts, where research activity exists but may be underrepresented in international databases. Turkey presents a compelling context for such research given its position bridging European and Asian markets, its SME-dominated business ecosystem, the significant role of family enterprises in the economy, and ongoing sustainability policy developments aligned with European Union frameworks. Comparative studies examining how circular economy principles are adapted within Turkish institutional environments, cultural contexts, and business structures would illuminate important questions about the transferability of predominantly European-derived frameworks to diverse settings. Similar research opportunities exist across other emerging economies where informal sectors, different regulatory environments, and distinct stakeholder configurations may require adaptation of circular economy approaches developed primarily in Western European contexts.

The field would benefit from methodological diversification, including more quantitative studies, mixed-methods approaches, and longitudinal research designs. Large-scale surveys could examine patterns of circular economy adoption and outcomes across multiple

organizations. Longitudinal studies could track how circular practices evolve and impact performance over time. Experimental designs could test specific interventions to promote circular behavior and practices. These methodological advances would complement existing case study research and strengthen the empirical foundation of the field.

The relationship between circular economy practices and organizational resilience deserves further exploration. Future research could investigate how circular approaches influence organizational adaptability, resource security, and response to disruptions. Studies could examine whether circular organizations demonstrated greater resilience during recent global crises such as the COVID-19 pandemic and supply chain disruptions. This research would contribute to both theoretical understanding and practical applications of circular economy in uncertain environments. Future research should develop more integrated theoretical frameworks that connect circular economy principles with broader theories of organizational sustainability. This includes exploring how circular economy relates to concepts such as planetary boundaries, doughnut economics, regenerative business, and just transitions. Integrative frameworks could help reconcile tensions and identify synergies between different approaches to sustainability, providing a more coherent theoretical foundation for research and practice.

Particular attention should be directed toward understanding circular economy and organizational sustainability integration in Turkish and broader Middle Eastern contexts, where research activity exists but may be underrepresented in international databases. Turkey presents a compelling context for such research given its position bridging European and Asian markets, its SME-dominated business ecosystem, the significant role of family enterprises in the economy, and ongoing sustainability policy developments aligned with European Union frameworks. Comparative studies examining how circular economy principles are adapted within Turkish institutional environments, cultural contexts, and business structures would illuminate important questions about the transferability of predominantly European-derived frameworks to diverse settings. Similar research opportunities exist across other emerging economies where informal sectors, different regulatory environments, and distinct stakeholder configurations may require adaptation of circular economy approaches developed primarily in Western European contexts.

Research should examine how policy environments influence organizational adoption of circular economy practices and, conversely, how organizational innovations can inform policy development. This includes attention to policy instruments (e.g., extended producer responsibility, tax incentives, procurement policies) and their effectiveness in promoting circular practices across different contexts. Research could also explore how organizations navigate policy landscapes, respond to regulatory changes, and participate in shaping policy agendas related to circularity. The integration of circular economy principles into organizational sustainability represents a dynamic and rapidly evolving research field with significant implications for both theory and practice. Our bibliometric analysis has mapped the

intellectual landscape of this field, identifying key research streams, influential contributions, and emerging trends that characterize its development. As global sustainability challenges intensify, circular economy approaches offer promising pathways for organizations to simultaneously enhance their competitive position and contribute to broader sustainable development goals. However, realizing this potential requires addressing complex implementation challenges, navigating multi-level barriers, and developing new capabilities for circular innovation and transformation. Future research that addresses the limitations and pursues the directions outlined in this analysis can make valuable contributions to both theoretical understanding and practical applications of circular economy in organizational contexts.

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Declaration of Contribution Rate: The authors have contributed equally.
Declaration of Support and Appreciation: The research did not receive any support from any institution or organisation.
Declaration of Conflict: The authors declare that there is no conflict of interest.

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