

Deconstructing The Scientific Landscape In Sustainable Business: A Bibliometric Analysis Systematic Literature Review

Mendekonstruksi Lanskap Ilmiah Dalam Bisnis Berkelanjutan: Sebuah Bibliometrik Analisis Tinjauan Pustaka Sistematis

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ABSTRACT

Research on sustainable business has experienced exponential growth in the last decade, reflecting the global urgency for more socially and ecologically responsible business practices. This study adopts a bibliometric and Systematic Literature Review (SLR) approach to map the intellectual landscape, identify research trends and highlight the most influential academic contributions in the discipline. By analysing more than 17,000 articles from the Scopus database from 2005 to 2025, the study reveals publication patterns, networks of scholarly collaboration, and conceptual dynamics that shape the discourse on corporate sustainability strategies and circular economy. The analysis indicates that stakeholder-based approaches and the integration of sustainability in the supply chain are the main pillars of building sustainable business models.

Keywords: *Sustainable Business, Bibliometric Analysis, Systematic Literature Review, Corporate Sustainability Strategy, Circular Economy*

ABSTRAK

Penelitian mengenai sustainable business telah mengalami pertumbuhan eksponensial dalam dekade terakhir, mencerminkan urgensi global terhadap praktik bisnis yang lebih bertanggung jawab secara sosial dan ekologis. Studi ini mengadopsi pendekatan bibliometrik dan Systematic Literature Review (SLR) untuk memetakan lanskap intelektual, mengidentifikasi tren penelitian, serta menyoroti kontribusi akademik yang paling berpengaruh dalam disiplin ini. Dengan menganalisis lebih dari 17.000 artikel dari database Scopus dalam rentang 2005–2025, penelitian ini mengungkap pola publikasi, jejaring kolaborasi ilmiah, serta dinamika konseptual yang membentuk diskursus mengenai strategi keberlanjutan korporasi dan ekonomi sirkular. Hasil analisis mengindikasikan bahwa pendekatan berbasis pemangku kepentingan dan integrasi keberlanjutan dalam rantai pasok menjadi pilar utama dalam membangun model bisnis berkelanjutan.

Kata Kunci: *Bisnis Berkelanjutan, Analisis Bibliometrik, Tinjauan Literatur Sistematis, Strategi Keberlanjutan Perusahaan, Ekonomi Sirkular*

1. Introduction

Sustainable business practices are increasingly recognized as essential for achieving the Sustainable Development Goals (SDGs), prompting a surge in academic interest in this field. This article, titled "Deconstructing the Scientific Landscape in Sustainable Business: A Bibliometric Analysis and Systematic Literature Review," aims to systematically explore the existing literature on sustainable business models through a bibliometric lens. The integration of sustainability into business strategies is not merely a trend but a necessity for long-term viability and ethical responsibility. As organisations strive to align with the SDGs, understanding the evolution of sustainable business literature becomes crucial. This study will provide insights into the key themes, influential authors, and emerging trends within this domain, thereby contributing to a more nuanced understanding of sustainable

entrepreneurship.

The primary objective of this research is to conduct a comprehensive bibliometric analysis that maps the landscape of sustainable business literature. By identifying the most cited works and prevalent research themes, this study seeks to highlight gaps in the current literature and suggest areas for future research. Additionally, the systematic literature review component will critically assess the methodologies and frameworks employed in existing studies, offering a clearer picture of the state of sustainable business research. This article will employ established bibliometric techniques to analyze publication trends, citation patterns, and co-authorship networks. The systematic literature review will follow rigorous protocols to ensure transparency and replicability, allowing for a thorough examination of the methodologies and findings of previous studies.

2. Literature Review

a. Thematic Trends in Business Sustainability Research

The business model concept can help integrate these elements into sustainable innovation research. (Boons & Lüdeke-Freund, 2013). As a holistic concept, sustainability is now following a similar trajectory with new initiatives being adopted by both the public and private sectors. (Linton et al., 2007). The thematic evolution in Business Sustainability research, as illustrated in figure 5, shows a shift in research focus from fundamental issues to a more specific and contextual approach. The concept of sustainability is deeply rooted in the physical and social sciences, so understanding the dynamics and interactions between human activities and the natural environment is crucial for the quality of life now and in the future. (Linton et al., 2007). In the early period (2005-2019), topics such as articles, sustainability, climate change, and sustainable development dominated the discourse, illustrating an early framework oriented towards conceptual understanding. During this period, companies that adopted sustainability practices early showed superior performance both in the stock market and in long-term accounting, indicating the positive impact of sustainability on corporate profitability. (Eccles et al., 2014). However, the sustainability performance achieved by the core company may lose its full value if its upstream supply chain members fail to implement practices that are aligned with sustainability principles. (Awasthi et al., 2018). Encouraging the concept of “enough” can have positive impacts, such as reduced resource consumption, sustainable lifestyles, and long-term customer loyalty, as well as creating new markets for improvements and services. (Bocken et al., 2016)

During the period 2020-2023, there was diversification with the emergence of themes such as agriculture, signaling greater attention to strategic sectors in the application of sustainability. With an increase in the number of publications related to climate change and agriculture, it also indicates a growing interdisciplinary interest in this area. (C. Li et al., 2024). The United States and China have emerged as influential countries in climate change and agriculture research, focusing on topics such as climate change impacts on agriculture, climate change mitigation and adaptation in agriculture, and crop growth in response to climate change. (C. Li et al., 2024). The keyword frequency analysis also showed that climate change and sustainability were the main keywords, signaling a shift towards an approach in addressing agricultural climate change. (Pius Awhari et al., 2024).

In the latest phase (2024-2025), the research focus is increasingly concentrated on the topic of sustainable development and China, reflecting the geographical relevance and global priority of sustainable development amid complex economic and environmental challenges. The research focus on sustainable development in China is increasingly important, reflecting the global priority and role of China in addressing complex economic and environmental challenges.

The research shows exponential growth over the past 30 years, with an emphasis on energy transition, sustainable urban development, technological innovation, and economic policy. (Hepburn et al., 2021; Shi & Yin, 2023) China is also working to integrate traditional Chinese philosophy with Western science to develop sustainability science. (X. Li & Clark, 2018). However, challenges remain, such as achieving a balance between economic growth and environmental sustainability. (Kang et al., 2019; Su et al., 2022). Therefore, global cooperation, especially in the field of energy efficiency and green economy is essential to address global environmental challenges. (X. Li & Clark, 2018; Lyu et al., 2022), So the consistency of themes such as articles and sustainability throughout the period demonstrates the central role of scientific documentation in supporting sustainability development.

b. Emerging Topics and Knowledge Gaps

The analysis of recent literature reveals several emerging topics gaining prominence in the sustainable business landscape alongside persistent knowledge gaps that require further investigation. These areas highlight the evolving nature of sustainability challenges and the need for innovative research approaches.

1) Emerging Topics

Standardized ESG reporting frameworks that increased regulatory requirements, such as the EU's Corporate Sustainability Reporting Directive (CSRD), are driving companies to adopt standardized ESG reporting and governance frameworks. Carbon accounting and scope three emissions management that accurately measures and reduces carbon emissions are becoming essential for meeting net-zero goals. The intersection of climate, nature, and social impact that integrates climate action, nature conservation, and social impact into cohesive strategies is gaining traction. Technology-driven sustainability, such as technologies like blockchain and artificial intelligence, is revolutionizing asset tracking and circular economy management. Circular economy and resource efficiency, the need for localized, circular solutions is being reinforced by economic volatility and logistical constraints.

2) Knowledge Gaps

Effective strategies for meeting sustainability goals that, despite progress in global assessments, the need for effective strategies to meet sustainability goals remains a critical gap, this includes identifying the most impactful interventions and understanding how to overcome barriers to implementation. Role of indigenous and local knowledge, the importance of indigenous and local knowledge in sustaining nature's benefits to people, has emerged as a key knowledge gap. Metrics for assessing sustainability, a lack of standardized metrics for assessing sustainability across economic, social, and environmental dimensions, remains a challenge. Scaling transformative sustainability solutions, many sustainability initiatives struggle to transcend pilot stages due to financial, operational, or regulatory hurdles, Research is needed to identify effective strategies for scaling up successful initiatives and embedding sustainability across entire organizations. Understanding and mitigating biodiversity loss and addressing biodiversity loss and ecosystem degradation require conservation efforts, sustainable land management, and a deeper understanding of the drivers of biodiversity decline.

c. Conceptual and Methodological Shifts

The article discusses significant conceptual and methodological shifts in the field of sustainable business models (SBMs). These shifts are characterized by the evolution of

frameworks and approaches that integrate sustainability into business practices. The first one is the emergence of sustainable business models. The transition from traditional business models to sustainable ones reflects a growing recognition of the need for environmental and social responsibility. This shift is supported by frameworks like the Business Model Canvas, which allows for the visualization and adaptation of business strategies to incorporate sustainability. (Najmaei & Sadeghinejad, 2023)

The second is the integration of sustainability into the business strategy. Earlier views of business models primarily focused on value creation. Recent studies emphasize the strategic role of business models in executing sustainability initiatives, highlighting the need for a comprehensive understanding of how sustainability can be embedded in core business strategies. (Barth et al., 2017; Karuppiah et al., 2023). The third is methodological advances. The research methodology has evolved from single case studies to robust multi-case analyses, enabling a deeper understanding of sustainable practices across various contexts. This methodological shift enhances the ability to derive generalizable insights about effective sustainable business practices. (Rittershaus et al., 2023)

Next is a focus on stakeholder collaboration. Recent frameworks emphasize the importance of collaboration among stakeholders, integrating both structural and cultural capabilities to foster sustainable practices within organizations. This approach recognizes that sustainability is not solely a managerial concern but requires engagement across the entire organizational ecosystem. For last one is resource-conservative manufacturing (ResCoM). The introduction of concepts like ResCoM represents a paradigmatic shift toward closed-loop manufacturing systems, promoting resource efficiency and sustainability in production processes.

3. Research Methods

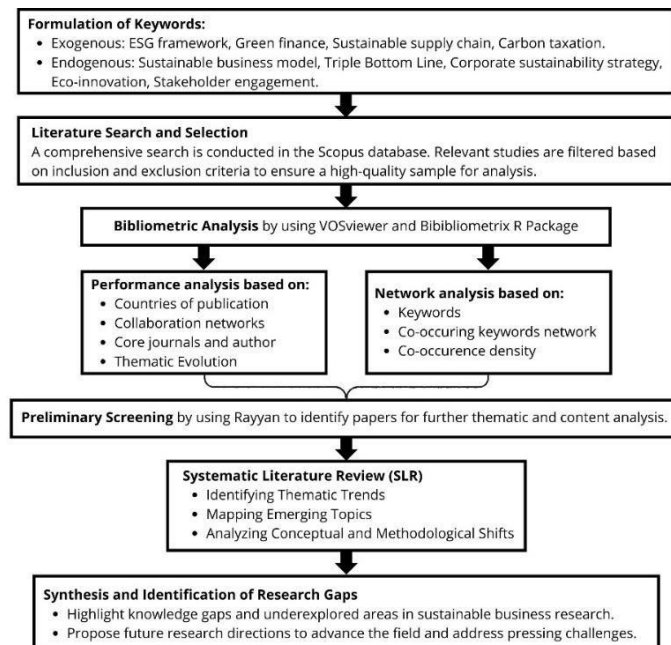


Image 1. Research Design

The methodological approach in this study adopts a mixed strategy that combines bibliometric analysis with a Systematic Literature Review (SLR) to explore in depth the dynamics of research related to sustainable business. The bibliometric method, as explained by Ball (2017) is a quantitative approach used to evaluate the academic quality of a field of study by measuring various indicators of scientific publications, such as the number of publications,

citation patterns, and the impact of research within the academic community. This approach enables the mapping of research trends and the identification of the most influential scholarly contributions in a field of study. While Systematic Literature Review (SLR), as defined by Omeihe & Harrison (2024) the literature review method is systematic, thorough and based on the principles of transparency and objectivity. This method aims to summarize, assess and synthesise findings from relevant academic research to answer clearly formulated research questions. SLR uses a protocol-based approach with an explicit and replicable methodology that ensures the results of the review can be scientifically accounted for and free from selection bias.

Table 1. The Sample for Bibliometric Analysis

Criterion	Number of Articles
Keywords:	44.660
Exogenous: Sustainability regulations, ESG framework, Green finance, Sustainable supply chain, Carbon taxation	
Endogenous: Sustainable business model, Triple Bottom Line, Corporate sustainability strategy, Eco-innovation, Stakeholder engagement	
Exceptions:	
• More than 10 years ago	
• Articles written in languages other than English	44.095
• Conference paper, Review, Book chapter, Note, Editorial, Book, Short survey, Retracted, Letter, Erratum, Data paper, dan Conference review	43.565
• Article title, abstract, atau keywords that do not have the word sustainable or sustainability	29,623
	17.949 (Final)

In this study, the sample selection was conducted by filtering articles indexed in the Scopus database using a combination of exogenous and endogenous keywords that have direct relevance to the topic of sustainable business, which is described in more detail in Table 1. This keyword selection process was systematically designed to ensure that the articles included in the analysis were closely related to the research objectives. After the initial identification stage, the literature screening process was carried out systematically by adopting a protocol of PRISMA (Page et al., 2021) to ensure transparency and accuracy in study selection. The inclusion criteria applied included the selection of full-text articles, written in English, peer-reviewed, and of high relevance to the research topic. Meanwhile, the exclusion criteria included the removal of books, articles published in conference proceedings, white papers, and publications in languages other than English to avoid potential interpretation bias. To ensure that the analysis reflected recent and relevant research developments, a temporal restriction was applied by only including studies published within the last 20 years, i.e. from 2005 to 2025.

After the article selection process was completed, data analysis was conducted using bibliometric methods, utilizing VOSviewer software combined with R Studio through the Biblioshiny feature. This approach allows for the mapping of intellectual structures as well as the interpretation of evolving research trends in the academic literature. Bibliometric analysis was applied through two main strategies. First, performance analysis, which assesses publications based on country of origin, patterns of collaboration networks, journals and lead authors, as well as thematic developments in the studies under study. Second, network analysis, which focuses on mapping co-occurring keyword networks and analyzing co-occurrence density to identify key concepts in the field of study. After the bibliometric analysis stage was completed, a Systematic Literature Review (SLR) was conducted to further explore the findings by citing articles that had been identified in the previous process. This approach includes analyzing studies that have high academic influence, including the most cited papers and most frequently referenced in similar

research such as (Bocken et al., 2016; Cheng et al., 2014; Purvis et al., 2019; Saberi et al., 2019; Seuring & Müller, 2008).

Although the methodological approach used in this study has been systematically designed to ensure the validity and objectivity of the findings, there are some methodological limitations that need to be observed. First, the database selection is limited to Scopus, thus allowing relevant articles indexed in other databases, such as Web of Science or SSRN, which were not included in the analysis. Secondly, the selection of keywords in the bibliometric process can affect the scope of studies analyzed, where variations in keyword combinations can potentially result in different article samples. Thirdly, the application of inclusion and exclusion criteria can lead to selection bias, especially in the initial screening process using a protocol of PRISMA, which, while increasing transparency and replicability, has the potential to eliminate studies that may provide valuable insights. Furthermore, bibliometric analysis, while powerful in mapping the research landscape, has limitations in delving deeply into the theoretical and conceptual nuances of each article, requiring a combination with Systematic Literature Review (SLR) to gain a more comprehensive understanding. Finally, while the temporal restriction of 2005-2025 aims to ensure a focus on recent developments, some of the older fundamental studies may remain of significant relevance to the evolving research dynamics.

4. Results and Discussions

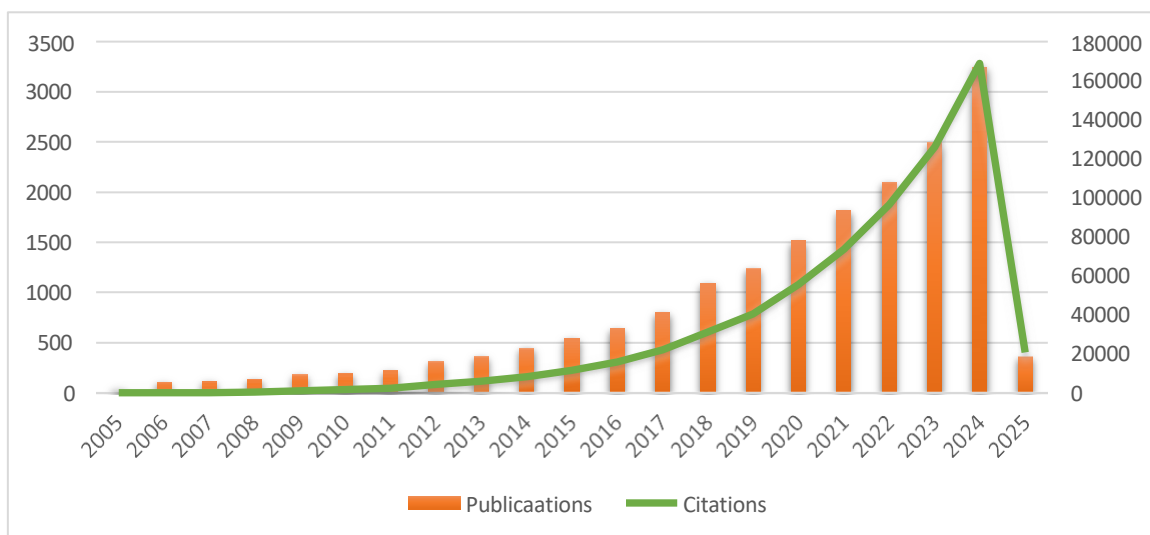


Image 2. Publication and citation pattern

Table 2. Most cited and productive countries by total publications and total citations

Country	Total Publications	Total Citations
United Kingdom China	2.247	123.343
United States India	3.482	116.266
Germany Iran	2.548	133.593
Italy France Canada	1.404	54.626
Australia	991	57.767
	711	28.497
	1.222	48.794
	737	38.285
	749	42.657
	1066	45.487

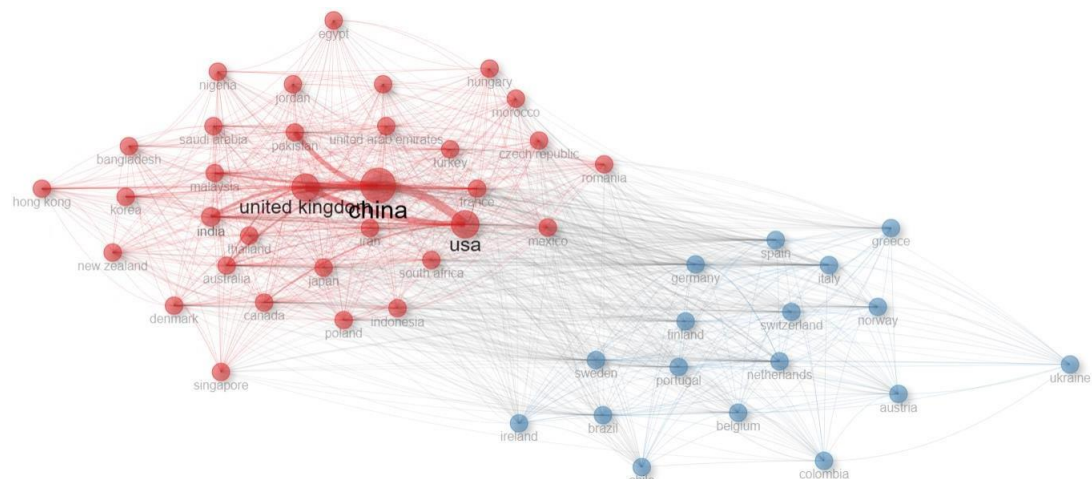


Image 3. Collaboration Networks

Table 3. Most cited studies

Title	Autors	Source	Year	Total Citation
From a literature review to a conceptual framework for sustainable supply chain management	Seuring, S. , Müller, M.	Journal of Cleaner Production	2008	4.429
Blockchain technology and its relationships to sustainable supply chain management	Saberi, S. , Kouhizadeh, M. , Sarkis, J. , Shen, L.	International Journal of Production Research	2019	2.319
Product design and business model strategies for a circular economy	Bocken, N.M.P. , de Pauw, I. , Bakker, C. , van der Grinten, B.	Journal of Industrial and Production Engineering	2016	2.278
Corporate social responsibility and access to finance	Cheng, B. , Ioannou, I. , Serafeim, G.	Strategic Management Journal	2014	2.093
Three pillars of sustainability: in search of conceptual origins	Purvis, B. , Mao, Y. , Robinson, D.	Sustainability Science	2019	1.787
Business models for sustainable innovation: State-of-the-art and steps towards a research agenda	Boons, F. , Lüdeke-Freund, F.	Journal of Cleaner Production	2013	1.581
The impact of corporate sustainability on organizational processes and performance	Eccles, R.G. , Ioannou, I. , Serafeim, G.	Management Science	2014	1.485
Sustainable supply chains: An introduction	Linton, J.D. , Klassen, R. , Jayaraman, V.	Journal of Operations Management	2007	1.285

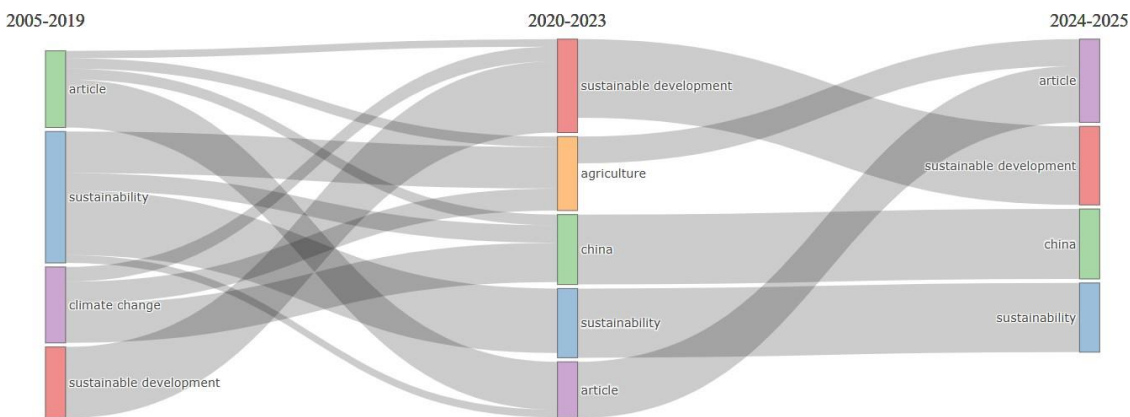


Image 4. Thematic Evolution

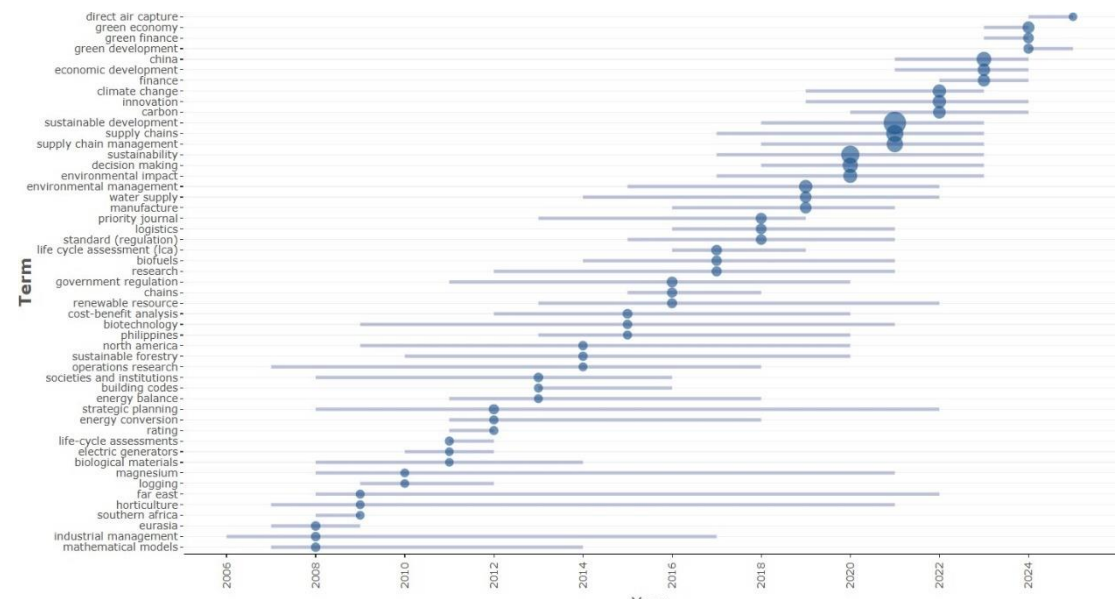


Image 5. Topic trend analysis; word minimum frequency = 5, number of words per year = 3

Table 4. Most cited and productive author by total publications and total citations		
Country	Total Publications	Total Citations
Govidan, K. Sarkis, J.	75	10.551
Seuring, S. Mangla, S.K.	68	13.191
Luthra, S.	41	10.238
Gunasekaran, A. Tseng, M.	55	6.883
	50	6.334
	40	6.636
	65	4.157
Bai, C.	22	3.160
Kusi-sarpong, S. Dubery, R.	25	2.814
	19	2.046

Network Analysis

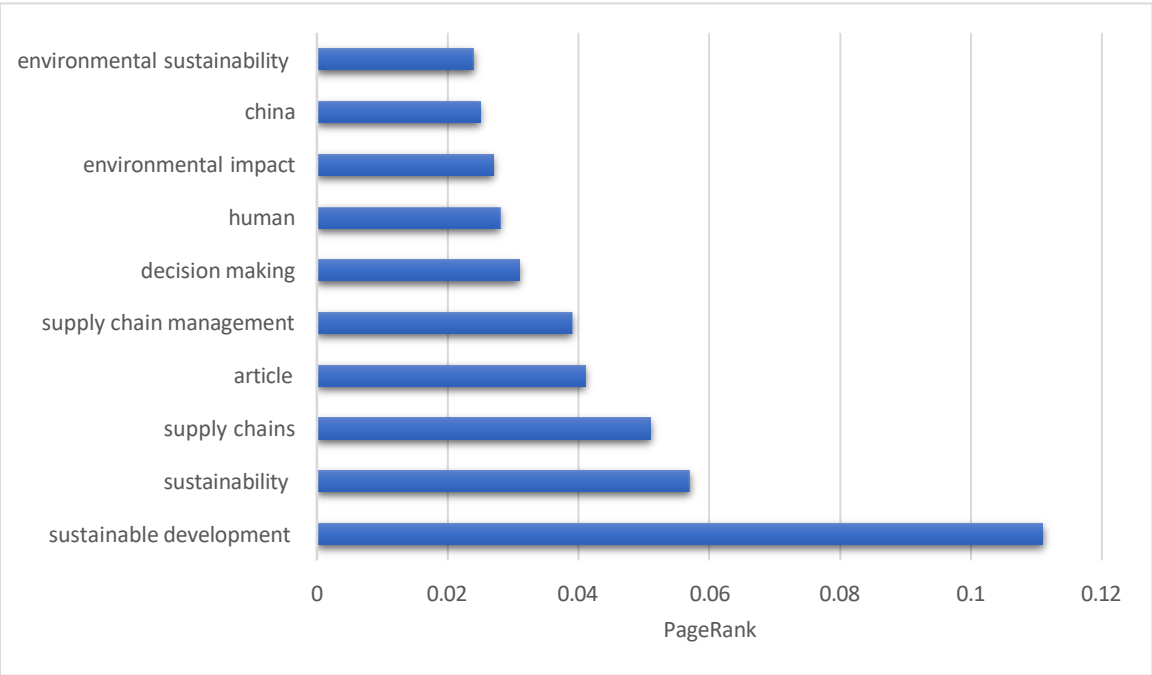


Image 6. Keyword Plus

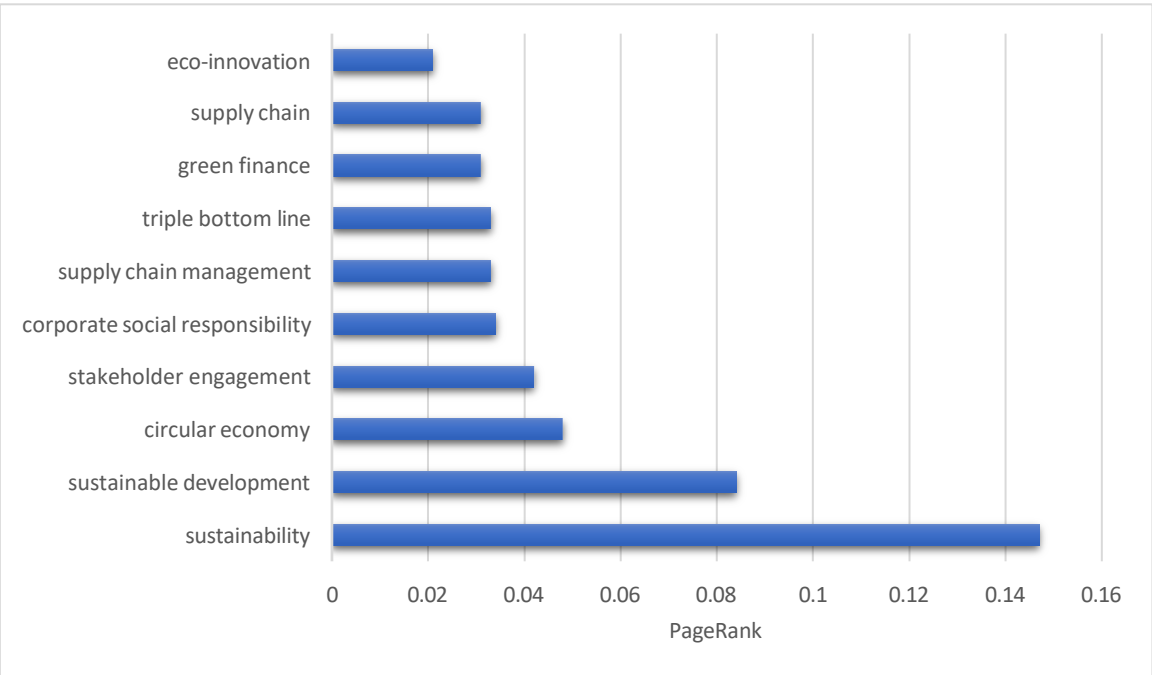


Image 7. Author Keywords
Table 5. Analysis of Keywords

Cluster 1 Economic and Financial Perspectives on Sustainability			Cluster 2 Stakeholders and Governance in Sustainability			Cluster 3 Sustainable Supply Chain and Corporate Strategies			Cluster 4. Environmental Impact and Circular Economy		
Keywords	OC	LS		OC	LS	Keywords	OC	LS	Key	OC	LS
sustainabilit	6940	26096	article	2025	14710	sustainable development	9230	39091	words		
y			human	1439	9743	supply chain management	3141	12458	environmental impact	1962	8883
china	1336	7464							life cycle	910	6246

environmen 1030 tal	6411	environmental 1207 7783	decision making 1955 9767	greenhouse gases 605 4546
economics				
climate 957 change	5687	sustainability 1800 6974	environmental 1081 6335	circular economy 892 3712
innovation 1250 5209		stakeholder 850 6055	management 942 5600	life cycle 430 assessment 3572
environmen 901 tal	5174	environmental 1192 5253	economic and social effects 838 4731	recycling 535 3368
regulations				
carbon 718 4813		stakeholder 784 5189	commerce 1144 4473	waste 508 management 3322
economics 702 4496		humans 416 3299	sustainable supply chains 617 3424	food supply 572 3129
carbon 601 emission 4317		controlled 449 study 2874	costs 658 2749	gas emissions 404 3121
environmen 634 tal policy	4227	agriculture 331 2722	supply chain 490 2743	life cycle analysis 347 2936
investments 671 4171		priority journal 270 2577	sensitivity analysis 496 2617	carbon footprint 377 2787
carbon 551 dioxide 3971		conservation 364 of natural 2547	optimization 498 2362	global warming 377 2780
emission 577 control 3852		resources 263 2436	manufacture 473 2352	greenhouse gas 296 2551
economic 513 developmen 3643 t		government 407 2402	planning 895 2276	
finance 675 3552		economic 347 aspect 2391	triple bottom line 501 2248	
green 615 economy 3387		united states 436 2301	competition 3736 1607	
green 800 finance 2939		water supply 277 2280	supply chains	
environmen 422 tal 2745		risk 315 assessment 2216		
technology				
economic 418 analysis 2700		procedures 274 2002		
alternative 426 energy 2652		female 327 2002		
corporate 837 strategy 2612		adult 264 1950		
investment 407 2563		water 377 management 2563		
sustainable 484 developmen 2494 t		male		
goals 428 2229				
energy 448 efficiency 2160				
governance approach				

Cluster 1

Economic and Financial Perspectives on Sustainability

Sustainable development aims to improve the welfare of society by meeting human needs and aspirations without compromising resources for future generations. It involves the efficient and sustainable management of resources, as well as the application of economic principles that take into account the long-term impacts of economic activity. In finance, sustainability includes the application of environmental, social, and governance (ESG) principles that focus not only on financial returns but also on the social and environmental impacts of investments. Economic sustainability in this context means that companies should manage assets and liquidity in a way that considers long-term sustainability. Sustainable economic policies should integrate sustainability aspects in the planning and implementation of development programs so as to create sustainable positive impacts on society and the environment. It also includes the development of initiatives that support innovation and environmentally friendly technologies. According to a recent study by UN Global Compact-Accenture (2010), 93 percent of 766 CEOs across countries consider Corporate Social Responsibility (CSR) to be an “important” or “very important” factor for the long-term success of their organizations.

Cluster 2

Stakeholders and Governance in Sustainability

The implementation of sustainable development requires effective corporate governance, which is aligned with the spread of good governance values and principles. In this regard, Salvioni and Astori (2013) suggest that the existence of legal regulations and social responsibility are key factors in supporting sustainable development policies. Correspondingly, companies in developing countries are often required to adopt more complex corporate governance systems, which emulate best practices from developed countries. An efficient governance system not only protects shareholders' interests but also increases investment attractiveness, which in turn reduces the cost of capital and strengthens investor confidence. Therefore, quality governance procedures become an important instrument in attracting foreign investors and gaining the trust of international financial institutions with regard to financing and investment (Salvioni & Astori, 2013).

With the increasing awareness of the environmental impact of business activities, multinational companies are now starting to adopt sustainable production methods and ecological-based systems to reduce waste and reduce energy and material consumption. This move aims to create a more environmentally friendly and efficient production system (Moktadir et al., 2018). Furthermore, globally successful companies tend to implement a diverse range of corporate governance practices, tailored to the needs of their stakeholders. They continuously innovate their organizational systems to ensure cohesive governance that is able to cope with the increasingly complex dynamics of the business market. In addition, they also seek to implement systems that can support the long-term sustainability of their business. Policies that focus on the values of social responsibility, fairness, and constructive relationships between organizations and shareholders contribute to the overall effectiveness of corporate governance (Salvioni & Astori, 2013).

Sustainability-based corporate governance emphasizes the importance of transparency in the dissemination of information related to social responsibility and stakeholder interests in the company's operations. This transformation in the governance structure contributes to the improvement of the company's decision-making system and control mechanisms. As the need for more transparent and accurate information increases, accountants are expected to expand the scope of disclosure by including sustainability aspects in their reports. This aims to provide more relevant information for stakeholders. While sustainable development is not a new concept, its popularity has steadily increased in recent years due to its focus on the well-being of the current generation without compromising the rights of future generations (Almagtome et al., 2019). The concept of sustainable development itself rests on three main pillars, namely economic growth, social justice, and environmental protection.

Corporate governance is designed to create a stable investment environment and ensure sound financial conditions in the capital markets by enhancing reliability, transparency and accountability at the corporate level. This approach shapes the relationship between the various parties associated with the company, including management, shareholders and other stakeholders. To maximize stakeholder value, boards of directors need to understand the social and environmental implications of their business activities. Furthermore, companies can be said to operate in society with the realization that they use public resources to conduct their business, so they have a moral and legal obligation to manage these resources responsibly (Siva et al., 2016).

According to stakeholder theory, every company has various stakeholder groups that have diverse needs and expectations, so companies must fulfill various social contracts with these groups. Globally, this theory has become a significant research approach in the social and environmental field and is often used to understand the reasons behind companies' adoption of social and environmental reporting practices. In addition, stakeholder theory is also used as an analytical framework in assessing factors that influence voluntary disclosure in both developed

and developing countries (Almagtome et al., 2017). In this context, Snider et al. (2003) revealed that stakeholder theory can be used as an appropriate model to evaluate corporate social responsibility (CSR). Meanwhile, Aras and Crowther (2008) highlight that corporate governance and sustainability policies are key aspects in supporting the sustainability of a company's operations. Therefore, many companies are increasingly paying more attention to the implementation of procedures related to corporate governance. Furthermore, Kocmanová et al. (2011) discuss the importance of integration between sustainability and corporate governance. They assert that an effective corporate governance system can increase the level of trust in the business sector and the economy at large, which in turn will strengthen the stability and sustainability of capital markets. In this context, integrating environmental, social and economic aspects into the corporate governance system becomes an important part of crafting the company's business strategy and long-term goals.

Schaltegger et al. (2012) explain two main reasons that explain the relationship between stakeholder interests and corporate sustainability initiatives. First, sustainability is a fundamental part of business activities, where economic value creation often depends on the voluntary implementation of social and environmental programs. Second, creating stakeholder benefits through sustainability practices can generate greater economic value by strengthening support for sustainable development. A concrete example of the link between value creation and stakeholder theory is how companies can create value for their stakeholders, for example by providing high-quality products, creating new jobs, paying taxes or providing economic benefits to financial institutions. In the context of sustainability, this concept is often associated with the development of environmentally friendly products that can increase employee pride and satisfaction at work. In addition, by reducing pollution levels, companies can attract a more qualified and motivated workforce, and gain the support of local communities.

Cluster 3

Sustainable Supply Chain and Corporate Strategies

Sustainable Supply Chain Management and the Role of Blockchain. Sustainable Supply Chain Management (SSCM) is a strategic approach to supply chain management that focuses on the integration of sustainability principles throughout its operational processes. This approach involves three main aspects, namely economic, environmental, and social, which is often referred to as the triple-bottom-line (Elkington, 1998). The main objective of SSCM is to create long-term value by reducing negative impacts on the environment and society while maintaining company profitability (Seuring & Müller, 2008). In the context of globalization, supply chains are becoming increasingly complex, so their management requires systems that are transparent and can be better monitored. One technology that has the potential to provide a solution is blockchain, a decentralized digital ledger system that can improve traceability, transparency, and data security in the supply chain (Saber et al., 2019; Kouhizadeh & Sarkis, 2018). This technology allows every party in the supply chain to access immutable information, thereby reducing the risk of data manipulation and improving operational efficiency (Francisco & Swanson, 2018).

Moreover, increasing pressure from governments, the global community, and consumers regarding the achievement of sustainability goals has prompted further research into how blockchain can strengthen sustainable supply chain management (Treiblmaier, 2018). This technology can help companies meet increasingly stringent sustainability regulations, reduce their carbon footprint, and increase customer trust through real-time product traceability (Saber et al., 2019). Overall, the implementation of blockchain-based SSCM has the potential to bring about a transformation in the global supply chain system by improving efficiency, transparency, and sustainability in business operations (Wang et al., 2020). However, the adoption of this technology still faces challenges such as high implementation costs, regulatory barriers, and the need for adequate digital infrastructure (Kshetri, 2018). Therefore, further

research and innovation are needed to optimize the benefits of blockchain* in supporting a more sustainable supply chain in the future.

Supply Chain Complexity and Traceability Challenges. Modern supply chains are complex in nature, consisting of multiple echelons and geographically dispersed entities that compete with each other to meet customer demands (Johnson, 2006; Lambert & Enz, 2017). With increasing globalization, diverse regulations, and cultural and behavioral differences within the supply chain network, the challenges of evaluating information and managing risks are becoming greater (Sarpong, 2014; Ivanov, Dolgui, & Sokolov, 2018). Problems such as inefficient transactions, rampant cases of fraud and theft, and poor supply chain performance lead to reduced trust among stakeholders. Therefore, improving information sharing mechanisms and implementing more accurate verification systems are urgently needed to ensure transparency and efficiency in the supply chain (Costa et al., 2013).

One aspect that is gaining increasing attention in the supply chain is traceability, which is a key factor in various industries, including the agricultural sector (Costa et al., 2013), pharmaceuticals and medical devices (Rotunno et al., 2014), and high-value products such as luxury goods (Maurer, 2017). In the luxury and premium product industries, information about the origin of a product often relies on physical certificates or paper-based receipts that are vulnerable to loss or forgery. This lack of transparency makes it difficult for stakeholders, including companies and customers, to verify the authenticity and assess the true value of a product (Maurer, 2017). In addition, the involvement of intermediaries in the supply chain increases the costs that companies must incur to ensure reliability and transparency. This further complicates the management of traceability systems and poses challenges in risk mitigation (Maurer, 2017). These issues not only impact operational efficiency but can also create strategic challenges that affect a company's reputation. In an increasingly competitive business environment, companies face high reputational risks due to the lack of transparency and accountability in their supply chains (Sarpong, 2014; Ivanov et al., 2018).

Blockchain as a Supply Chain Transparency Solution. To overcome these problems, blockchain technology has begun to be developed as an innovative solution to increase transparency and traceability in the global supply chain (Saber et al., 2019). Blockchain functions as a decentralized digital recording system that allows every transaction to be recorded securely, immutable, and verifiable by all parties involved. This technology offers a solution in ensuring product authenticity, reducing the risk of counterfeiting, and increasing operational efficiency in the supply chain (Kshetri, 2018). In the context of a complex global supply chain, the adoption of blockchain technology can improve product traceability from the production stage to the end consumer. This can provide benefits not only for companies in increasing logistics efficiency, but also for customers who are increasingly concerned about the transparency and sustainability of the products they consume (Francisco & Swanson, 2018). Therefore, the integration of blockchain in the supply chain is expected to be a long-term solution in increasing trust and accountability throughout the global supply chain ecosystem.

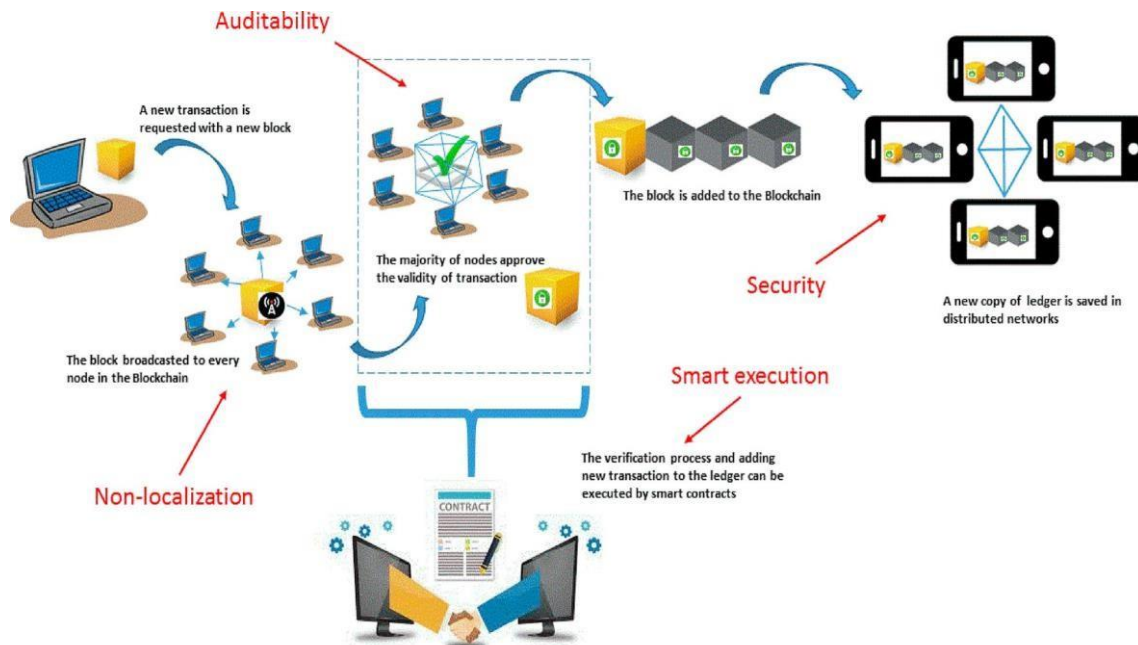


Image 8. Steps in blockchain information and transactions

Cluster 4

Environmental Impact and Circular Economy

The circular economy contributes to reducing negative impacts on the environment by minimizing waste and increasing recycling. For example, implementing a circular economy can reduce carbon emissions and the overuse of natural resources. From an economic perspective, the circular economy opens up new employment opportunities. Moreover, by maximising the value of resources and reducing production costs through recycling, companies can increase efficiency and profitability. The circular economy also has the potential to increase industry competitiveness by adopting sustainable practices that are increasingly sought after by consumers.

The circular economy is increasingly recognized as an approach that can reduce pressure on global resources and minimize environmental impacts. From an economic perspective, shifting to a circular system can create new business opportunities, reduce production costs, and improve efficiency in resource utilization. The terms “circular economy” and “sustainability” have become topics of much discussion among academics, businesses, and policymakers. However, despite the interconnectedness of these two concepts, their differences and similarities are still not clearly defined (Geissdoerfer et al., 2017). Sustainability is oriented towards solving ecological, social, and cultural challenges in the long term. While the literature on sustainability generally emphasizes environmental aspects, the circular economy is more specific in offering an approach based on resource reuse and efficiency as a solution to the environmental and economic problems faced today. The main goal of the circular economy is to turn waste into valuable resources and create a more integrated production and consumption system. Despite the growing popularity of the concept, there are limited studies on its implementation and impact (Witjes & Lozano, 2016). In recent years, sustainable circular economy practices have been increasingly implemented in various countries as an effort to realize a more environmentally friendly and efficient economic model in resource utilization. This reflects the growing global awareness of the importance of managing resources responsibly to reduce waste and support the transition to a more sustainable economy.



The bibliometric analysis reveals a significant growth in the literature surrounding sustainable business practices over recent years, indicating an increasing academic interest and urgency in addressing sustainability challenges within the business sector. The systematic literature review identifies prevalent themes, such as the integration of sustainability into

business strategies, the role of innovation in promoting sustainable practices, and the importance of regulatory frameworks in guiding corporate behaviour towards sustainability. Notable gaps in the existing research are highlighted, particularly the need for more comprehensive metrics that assess sustainability across various dimensions- economic, social, and environmental. This underscores a critical area for future research to develop standardized frameworks that can effectively measure and compare sustainability efforts across different industries.

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