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Forty-five years of research on corporate social responsibility (CSR) and sustainable development: an overview and research agenda

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ABSTRACT

This bibliometric study presents a rich academic correlation between Corporate Social Responsibility (CSR) and sustainable development in the form of a critical review of trends, significant contributions, and existing gaps in the evolving domain. By adopting citation analysis and thematic mapping, this study established the evolution of topics over time, with the identification of key authors and relevant papers in the field. Thus, the outcome tells a story of shifts and trends in the CSR research domain, arguing about the convergence of corporate social responsibilities with sustainable development goals (SDGs). This critical review highlights gaps in CSR and sustainable development viz. sectoral dynamics and regional disparities, over dependence on western contexts, ignorance of indigenous norms and fragmented political tools to align CSR with SDGs that deserve further research. The findings of the article include under-utilization of the technological resources of developing economies, importance of technical innovation in promoting SDGs through CSR activities, ethical decision-making and stakeholder engagement as means for sustainable development. Thus, this article should help scholars, practitioners, and legislatures to come up with better-informed decision making concerning the ways in which CSR practices can effectively support sustainable development policies.

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M14; Q01

1. Introduction

1.1. Evolution of CSR

Over the past decades, corporate social responsibility has evolved, and, for the most part, is integrated with the aim of advancing toward sustainable development. The development demonstrates rising awareness of the critical role that businesses have played in addressing the complex social, environmental, and economic challenges faced by the world today (Aguinis & Glavas, 2012).

Corporate social responsibility was earlier understood as corporate philanthropy, where, in the early years, firms were primarily engaged with charitable contributions and community welfare initiatives (Carroll, 1999). Corporate Social Responsibility (CSR) has evolved into a tactical approach, in which social and environmental considerations blend with economic incentives to shape the core of business activities (Dahlsrud, 2008). This holistic approach to CSR recognizes the business as not an independent entity per se, but as immersed and dependent on the broader health of the neighborhoods and ecosystems in which it functions (Porter & Kramer, 2007). However, critics say that many companies still find it hard to put sustainability ahead of short-term profits, even with this all-around integration. This makes us wonder if CSR efforts are truly changing or just a way to get things done, like in cases of 'greenwashing'. The CSR roots trace back to the early twentieth century industrialists, such as Andrew Carnegie, which defended philanthropy as a moral duty. Howard R. Bowen's (2013) seminal work, the entrepreneur's social responsibilities, formalized CSR as an academic discipline, arguing that companies must meet social needs beyond profit (Bowen, 2013). Later, 'CSR Pyramid' from Carroll (1991) expanded this to

ethical, legal and philanthropic dimensions (Carroll, 2016), while Porter and Kramer's (2006) 'shared value' model redefined CSR as a strategic lever for competitive advantage, and a change of paradigm is still shaping the modern discourse (Roszkowska-Menkes, 2023).

1.2. CSR and sustainable development goals (SDGs)

Global imperative for CSR is underlined by the United Nations Sustainable Development Goals (SDG), which keeps businesses as important actors in addressing planetary changes such as climate change, inequality and resource deficiency. For example, more than 90% of fortune 500 companies now align CSR strategies with SDGs, reflecting a change for strategic engagement from compliance-operated benevolence (Eccles et al., 2014). However, this progress remains uneven: while European firms lead to integrating circular economy principles, emerging economies such as India faced systemic obstacles such as misaligned community needs and weak governance (Sharma & Sathish, 2022).

Empirical studies reveal divergent results. McWilliams and Siegel (2001) have shown that CSR increases long-term profitability through brand loyalty, while Delmas and Burbano (2011) criticized superficial 'green wash' tactics in industries such as fast fashion. In the extractive sectors of Africa, Okolo-Obasi et al. (2020) found that CSR initiatives improved access to education, but fought with cultural misalignment, highlighting the need for context sensitive structures. Such contradictions emphasize the absence of universal metrics to evaluate the contribution of CSR to sustainable development.

1.3. CSR in real world

The implementation of CSR in the real world faces persistent barriers. At Nigeria's Niger Delta, Shell's CSR projects failed due to community distrust and tokenistic consultations (Uduji & Okolo-Obasi, 2023). Similarly, in China, Chinese companies deal with regulatory ambiguity, usually by prioritizing symbolic environmental investments on transformative practices (Yang & Chen, 2022). These cases reveal systemic gaps in accountability, inclusion of stakeholders, and coherence of policies and assumptions exacerbated by conflicting shareholder priorities (Scherer & Palazzo, 2011).

1.4. Critical gaps in existing literature

Three critical gaps persist in the existing CSR literature: (1) specific dynamics of the sector (eg technology vs. mining) and regional disparities (eg sub-representation of Africa) (Kolk, 2016); (2) theoretical structures excessively depend on western contexts, neglecting indigenous norms (Van Zanten & Van Tulder, 2018) and (3) fragmented political tools to align CSR with SDGs (Xie et al., 2019). Without approaching them, the CSR risks becoming a performance exercise, not a system of systemic change.

This study addresses these gaps through a 45-year bibliometric analysis of 1300 publications, mapping the evolution of CSR into geographies, sectors and theoretical lenses. It tries to map the sectoral disparities (eg manufacturing vs tech vs mining) and global regional disparities. By identifying clusters such as 'SDG alignment' and 'AI-oriented sustainability analysis', we help policy formulators with fact-specific regulations and equip researchers with a script to explore sub examined areas, such as circular economy integration in emerging markets.

Today, the concept of CSR is related to an extremely broad spectrum of activities that support sustainability and help address societal challenges. Key areas appropriate for this context include environmentally friendly production with reduced environmental impacts, investment in renewables, and waste reduction with recycling (Bansal & DesJardine, 2014). On the same note, CSR fosters diversity and inclusivity because it ensures a fair practice concerning labor, including investments in the growth and welfare of employees (Aguinis & Glavas, 2012; Joshi et al., 2021). Companies are now more engaged in communicating with stakeholders, cooperating with NGOs, and promoting initiatives for community development. (Matten & Moon, 2008).

All the above-mentioned activities are coupled with awareness of the fact that sustainable business practices can create sustainable competitive advantages. Therefore, the demand for stakeholders and

legal reforms have driven the integration of CSR and sustainable development (Eccles et al., 2014). Also, companies often have trouble balancing the needs of stakeholders for sustainability with the needs of shareholders to make the most money. This conflict makes us wonder if the current regulatory frameworks give businesses enough of a reason to adopt transformative CSR practices, or if they only push them to meet the bare minimum. Thus, most companies had to incorporate sustainability into their mission statements while outlining other ambitious sustainability targets and reporting on CSR performance (Hahn & Kühnen, 2013). However, the link between CSR and sustainable development remains challenging. Some argue that CSR may be nothing but ‘greenwash’ or ‘blue wash’ meaning using CSR as mere PR rather than changing practices (Delmas & Burbano, 2011). Even though these projects show growth, there is still no agreement on standard metrics that can be used to measure the real effect of CSR on sustainable development. Critics also say that these kinds of attempts might only deal with small problems and not systemic problems like global inequality and resource loss. The degree to which businesses prioritize stakeholder rewards over shareholder profits and the extent to which governments should encourage and regulate corporate social responsibility are topics of ongoing discussion (Scherer & Palazzo, 2011).

1.5. Regional and sectoral disparities

In Nigeria’s Niger Delta, multinational oil companies allocated 72% of CSR budgets to health and education. However, Okolo-Obasi et al. (2020) revealed that cultural misalignment such as excluding indigenous leaders from decision-making that led to 65% of projects being abandoned within five years. Contrastingly, China’s energy sector saw firms adhering to the 2014 Environmental Protection Law achieve a 34% increase in sustainable practices, driven by stringent policies and stakeholder engagement (Yan et al., 2022).

1.6. Emerging methodologies

Technological integration is reshaping CSR accountability. For instance, Zhang et al. (2024) used AI-driven analytics to track CSR contributions in 500 global firms, revealing that Blockchain-enabled supply chains improved transparency by 40% in sectors like apparel. However, in case of Africa, only 12% of African firms adopted such tools due to funding gaps (Uduji & Okolo-Obasi, 2023).

1.7. Education and grassroots impact

In Karnataka, India, CSR initiatives in education improved school infrastructure and teacher training, yet 42% of programs faced administrative bottlenecks, emphasizing the need for stronger governance (Mohan & Shivalingappa, 2023). Meanwhile, Brazil’s Amazon reforestation projects by Vale sparked legal disputes over indigenous land rights, illustrating the risks of top-down CSR models (Milanez & Dos Santos, 2019).

Thus, the integration of CSR and sustainable development is of utmost importance for businesses, governments, and civil society. When global challenges, such as climate change, inequality, and resource scarcity are increasingly brought to the table, it is important for companies to actively promote sustainability. Having businesses operate in line with the principles of sustainable development will ensure a more equitable, resilient, and prosperous future for all people. Going forward, it is important for companies to use open reporting systems that go beyond approaches that are based on compliance. Governments must also take the initiative to make strong policy frameworks that encourage real efforts to be sustainable. When people from academia, business, and civil society work together across disciplines, they can fill in more gaps in our knowledge and come up with new ways to achieve sustainable growth.

Guided by the question: ‘how has CSR research evolved to deal with sustainable development and what gaps in sectoral, regional and methodological approaches make it difficult to transform?’, this article tries to fill the theoretical advances with practical barriers, offering a scaffolding for interdisciplinary collaboration and evidence-based policymaking.

1.8. Summary on how sustainable development and CSR are related

Carroll (1991) opined that CSR is a quadruple dimension of economic, legal, ethical, and philanthropic activities, which together augment sustainable development, as corporate activities are aligned with social wants. Waddock and Graves (1997) viewed CSR as a performance-enhancing factor, as it enables organizations to build internal assets and capabilities that are perceived as valuable. Carroll (1999) stated that CSR is an integral element of the development process since business activities encompass socially and environmentally responsible operations along with obligations to the economy, law, ethics, and philanthropy. A lot of study has already been done on the positive link between CSR and sustainable development, but there are still big gaps in the knowledge. For example, there isn't a lot of real-world evidence about how the dynamics of a sector change affects the CSR work. Also, differences between region's rules and regulations and how people in those regions feel about sustainability need more research (Cumbana & Ventura, 2025; Dinçer et al., 2023; Panda et al., 2024).

1.9. Theoretical foundations of CSR and sustainable development

1.9.1. Stakeholder theory

Stakeholder theory suggests that companies must create value for all stakeholders viz. investors, employees, customers, suppliers and communities and not just for shareholders (Freeman, 1984). This theory corresponds to CSR's overall approach, and emphasizes ethical commitment and long-term partnerships. For example, Shell's CSR errors in Nigeria highlight the consequences of neglecting societal interests (Uduji & Okolo-Obasi, 2023). By prioritizing stakeholder needs, companies improve brand loyalty and contribute to SDGs such as quality training and reduced inequalities (Hörisch et al., 2014).

1.9.2. Institutional theory

Institutional theory examines how external pressure (regulatory, normative and mimetic) form CSR adoption (DiMaggio & Powell, 1983). For example, China's law on environmental protection in 2014 created forced pressure for companies to start tree planting campaigns (Yang & Chen, 2022). This theory explains regional differences in CSR practice, such as Europe's focus on circular economics principles versus Africa's cultural misalignment (Kolk, 2016).

1.9.3. Social contract theory

This theory is rooted in Rousseau's philosophy, and affects CSR as a moral obligation between business and society (Donaldson & Dunfee, 1994). It supports compulsory CSR laws, such as India's section 135, which provides a mandate to 2% surplus distribution to social welfare (Sharma & Sathish, 2022). However, criticism argues that it simplifies power imbalances, as is seen in Vales Amazon -forest planting projects that ignored Indigenous Rights (Milanez & Dos Santos, 2019).

1.9.4. Political theory

Political theory sees CSR as a tool for companies to gain legitimacy and influence policy (Scherer & Palazzo, 2011). Multinational companies (MNCs) like Unilever use CSR to navigate weak control in emerging markets, and compliance with SDG to avoid legislative penalties (Van Zanten & Van Tulder, 2018). However, this may result in 'greenwashing', where CSR becomes a reputation shield rather than a transformative practice (Delmas & Burbano, 2011).

1.9.5. Main theoretical lens: institutional theory. This research article adopts institutional theory as its primary framework. The bibliometric analysis reveals how regional regulatory norms (eg EU directives versus Chinese ambiguity) and mimetic pressure (eg Fortune 500 companies that mimic SDG-adjusted CSR) run research trends. For example, 76% of studies focus on Western contexts due to compulsion of ISO 26000 standards, while Africa's under-representation reflects weak institutional enforcement (Kolk, 2016).

2. Literature review

2.1. Corporate social responsibility (CSR)

Originally started in the 1930s with Bowen's (1953) social responsibility for the businessman, CSR is defined as a company's obligation to follow policies benefiting society (Bowen, 2013). Carroll's (1991) pyramid later expanded this to economic, legal, ethical and philanthropic dimensions, and emphasized adaptation to social expectations (Carroll, 1991).

2.1.1. Sustainable development

As mentioned in the Brundtland report 1987, sustainable development means 'meeting current needs without compromising on future generations' ability to meet their future needs' (Butlin, 1989). It received prominence in the UN SDG in 2015, which links CSR to 17 global goals such as climate acts and gender equality (Lee et al., 2016).

McWilliams and Siegel (2001) noted that CSR implementation, in the long term, would be advantageous to companies that ensure the integration of sustainable development goal (SDG) factors into their strategic agendas. Sen and Bhattacharya (2001) claimed that CSR improves the reputation of a corporation and allows smooth and efficient sustainable development owing to different positive consumer attitudes and awareness about desirable business conduct. Orlitzky et al. (2003) concluded that CSR is positively associated with sustainable development, where CSR practices strengthen corporate reputation and stakeholder relationships, which leads to better organizational performance, thus benefiting the society. Payne (2006) argued that CSR is part of what contributes to sustainable development as it convinces organizations to formulate strategies that aid their long-term survival while assisting the welfare of society and its immediate ecosystem.

Porter and Kramer (2007) state that sustainability now a days, must be part of business plans, and sustainable profit is achievable, but corporations without alignment to social and environmental responsibilities generally flounder looking at the link between corporate social responsibility and sustainable development. Moon (2007) demonstrated that doing good business can harmoniously lead to the strengthening of organizational performance and fostering desirable societal outcomes. Tate et al. (2010) conducted a quadrant analysis to reveal the synergy of CSR and sustainable development, painting a picture of mutually beneficial strategies that improve environmental care and social equity over time. Dao et al. (2011) stressed that CSR is vital to long-term development, as it forces businesses to incorporate ESG concerns into their core strategies to create durable resilience and a positive impact on society.

Simionescu (2015) developed a conceptual model that explains the nexus between CSR and sustainable development in a bid to inspire future studies to flesh out how such concepts are intertwined. Rahdari et al. (2016) observed that CSR plays a significant role in achieving sustainable development, based on the understanding that companies can only pursue sustainability by contributing their endeavors to ecological and social goals. Kolk (2016) concluded that CSR practices considerably boost sustainable development by making business operations meet the expectations of communities and environmental governance, which also improves the performance of an organization and the well-being of societies. Alvarado-Herrera et al. (2017) point out that CSR is one of the pillars of sustainable development because it helps organizations follow value creation, which solves social problems while raising their competitiveness and sustainability. As cited by Van Zanten and Van Tulder (2018), CSR is instrumental in sustainable development because it forces corporations to engage with practices that enhance their economic performance and positively affect social and environmental dimensions.

Xie et al. (2019) say that the most fundamental first step toward sustainable development is the incorporation of CSR into a company's strategy since such integration lets an entity handle social and environmental issues while preserving economic growth. Ye et al. (2020) address how business social responsibility supports sustainable development. They explain how CSR activities could be used to considerably increase social and environmental outputs when incorporated into strategies. Avotra et al. (2021) claimed that CSR enhances the sustainable development of an organization through responsible environmental practices and promotion of social justice in the business setting.

In the recent years, the work done by Costa et al. (2021) assessed the convergence between CSR and sustainable development. According to this study, CSR initiatives might enable companies to reach social

and environmental advantages as well as transition toward sustainable practices. Moreover, building a sustainable future and attending to stakeholders' requirements depend on CSR inclusion into business plans. Competitive advantage and sustainability in the long run, according to Ayu Purnamawati et al. (2023) rises via social problem solutions and CSR-created shared values for companies. Zhang et al. (2024) suggested that CSR is an essential tool for sustainable development, as it propels enterprises not only to benefit from practice, but also to have a positive impact on environmental and social dimensions. Arora et al. (2025) analyzed over two decades of research on corporate sustainability, using advanced topic modeling and bibliometric methods to identify key trends, influential authors, and emerging areas within the field. It reveals a significant rise in corporate sustainability research since 2015, with well-established themes such as climate action, sustainable supply chain management, and environmental reporting, alongside underexplored areas like behavioral insights in sustainability decision-making, the integration of digital technologies for sustainability, and the impact of regional regulatory differences on corporate sustainability strategies. Rani et al. (2025) investigate how corporate social responsibility (CSR) initiatives influence sustainable development, focusing on the interplay between regulatory frameworks and organizational practices in different regions. It highlights that while CSR contributes positively to sustainability, variations in local regulations and stakeholder expectations present ongoing challenges for companies aiming to implement effective CSR strategies.

3. Objectives of the study

Historically, many other studies have been conducted on different issues concerning CSR and sustainability (Fatima & Elbanna, 2023; Khan et al., 2020; Meseguer-Sánchez et al., 2021; Sharma & Sathish, 2022). However, no research paper has integrated almost all the information concerning the relationship between CSR and sustainable development. In this study, we aimed to fill this gap. The primary aim of this study is to present a comprehensive summary of the current body of knowledge on corporate social responsibility (CSR) and its relationship with sustainable development by addressing the following research questions. (1) What current patterns can be observed in publications related to CSR and sustainable development concerning authors, institutions, countries, journals, fields of study, types of research, and economic contexts? (2) Which key subjects and themes are most prominent in the literature on CSR and sustainable development? (3) What is the current theoretical framework that guides studies concerning CSR and sustainable development and what novel developments have occurred in this area of study? (4) What specific knowledge gaps exist in the study of CSR and sustainable development and what potential areas for future research could be explored?

4. Research methodology

This study encompasses research papers published over the past 45 years, from 1979 to the present, sourced from the Scopus database. Launched in 2004 by Elsevier, Scopus is an abstract citation database that includes a vast array of academic content. It features over 90 million records, including articles, conference papers, and books, from more than 39,000 titles published by over 7000 publishers worldwide. It is controlled by an independent Content Selection and Advisory Board, ensuring that only excellent-quality research is included, thus making it even more authoritative as a source for bibliometric analysis. V. K. Singh et al. (2021) revealed that Scopus offers far higher coverage than Web of Science, with over 27,000 indexed journal titles and more than 155 million indexed articles; however, it is difficult to track peer-reviewed articles published before 1996 in Scopus. To address this problem, and to make up for data gaps before 1996 if any, the authors have utilized strategies like manually adding the earlier important publications to increase comprehensiveness, cross-referencing with Web of Science (Subbotin & Aref, 2021). The authors further utilized free software application Bibliometrix R, to analyze the literature.

The filtering process illustrated in Figure 1 for the bibliometric analysis of CSR and sustainable development comprised multiple systematic steps to refine the dataset. A search was performed in the Scopus database with the terms 'CSR and sustainable development', resulting in approximately 9056 articles. The dataset was restricted to works classified as 'articles' or 'reviews' to maintain relevance and quality.

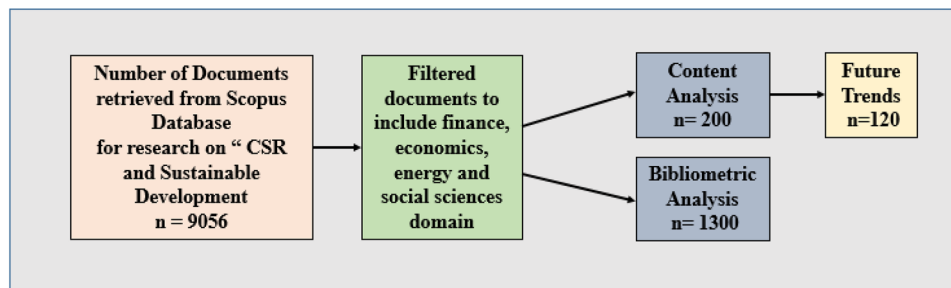


Figure 1. Stepwise analysis procedure.

Refinement was enhanced by sorting results based on relevance and concentrating on publications from fields including social sciences, finance, energy, and economics. This step significantly reduced the dataset. Filters were implemented to eliminate irrelevant fields or document types, thereby ensuring the inclusion of only peer-reviewed, high-quality studies. The authors utilized analytical tool Bibliometrix R. The dataset was ultimately refined to 1300 publications identified as most relevant for bibliometric analysis (Demin & Kouprianov, 2021). This systematic method provided a solid and targeted dataset for examining trends and contributions in CSR and sustainable development research.

Reviews also come in many varieties, such as an organized review that focuses on the most acceptable methods, theories, or frameworks, a theory-based reviews (Dalgetty et al., 2019), framework-oriented reviews (Paul & Feliciano-Cestero, 2021), bibliometric analysis reviews (Donthu et al., 2021), meta-analytical reviews (Çoğaltay & Karadağ, 2015), hybrid-narrative reviews (Dabić et al., 2020), and model/framework-based reviews (Bergeron et al., 2017). Bibliometric analysis is a commonly used method for delineating a knowledge framework pertinent to a research subject (Linnenluecke et al., 2020). Systematic literature reviews have been conducted to investigate prevailing scholarship, minimize bias, and propose probable gaps in the current literature (Kumar et al., 2019).

Of all the bibliometric methods employed, citation analysis and co-citation analysis are the most widely applied, as they clarify the relationship between cited works and citing works. Moreover, co-citation can further enrich content analysis and contribute to clustering and keyword analysis (Hou et al., 2018). This study employed tools such as citation network analysis and publication trend analysis (Struck et al., 2021). After conducting a content analysis, the authors further engaged in a bibliometric study to achieve a holistic investigation and fill the gap that exists in the literature pertinent to CSR and sustainable development (Paul et al., 2021). This study, in addition to spelling out trends of current research into CSR and sustainable development, will potentially reveal future directions for this line of research. The analytical framework is illustrated in Figure 2.

Figure 2 shows a structured research agenda for Bibliometric analysis of corporate social responsibility (CSR) and sustainable development. Bibliometric analysis addresses the trends of publication (RQ1), Prolific journals (RQ2), and conceptual outline (RQ3) through techniques such as citation analysis, keyword mapping and co-element analysis. It examines the development of quantitative publications, influential writers, publications and countries contributing to the field. Material analysis provides insight into thematic groups and intervals in literature by qualitatively analyzing clusters (RQ3) and identifying future research fields (RQ4). Together, these approaches provide a comprehensive framework to understand current research trends and future research agenda.

According to Donthu et al. (2021), bibliometric analysis comprises two principal phases: main techniques and enrichment techniques. Main techniques are categorized into performance analysis and science mapping. Performance analysis encompasses metrics related to publication, citation, and publication-citation. Science mapping includes citation and co-citation analysis, co-word analysis, and co-authorship analysis. Network analysis primarily focusses on clustering. Visualization of these analyses can be achieved using various software tools such as Bibliometrix R, Gephi, VOSviewer, Pajek, and UCINET. In this instance, we utilized Bibliometrix R for visualization. Based on the aforementioned methodology for bibliometric analysis, we will commence with performance analysis.

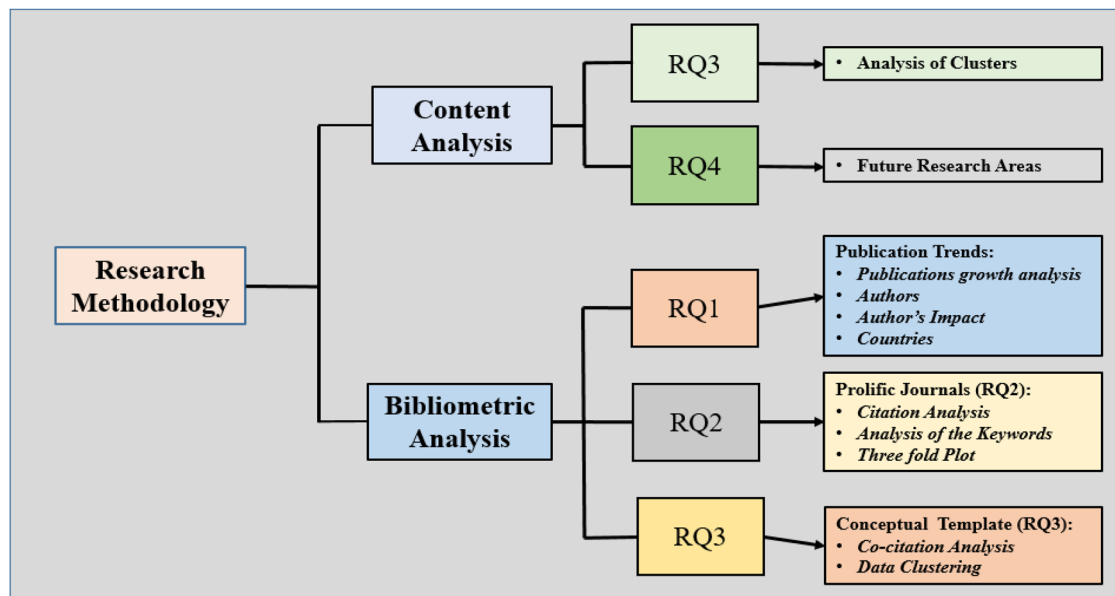


Figure 2. Approach toward analysis.

Table 1. Summary statistics overview.

Description	Results
Main information about data	
Timespan	1979:2024
Sources (journals, books, etc)	534
Documents	1300
Annual growth rate %	10.04
Document average age	6.51
Average citations per doc	35.32
References	73,855
Document contents	
Keywords plus (ID)	2953
Author's keywords (DE)	3419
Authors	
Authors	3075
Authors of single-authored docs	269
Authors collaboration	
Single-authored docs	282
Co-authors per doc	2.65
International co-authorships %	23.23
Document types	
Article	1152
Conference paper	148

Source: Created by authors from the Scopus data analysis.

5. Performance analysis

5.1. Summary statistics overview

Table 1 shows the total number of articles extracted from the Scopus database. This sum is of 1300 publications in the aggregation comprising 1152 research papers and 148 conference articles. The aggregation sources were articles that came from 534 sources. The core focus areas, economics and finance, became the top priority in the course of study.

A total number of unique keywords identified were 2053. In the literature review with a time span of 45 years, that is, from 1979 until now, the average sum of 35.32 citations per document was found. Of the 282 documents published by 269 different authors, most were single-author texts. In total, 3075 authors participated in this research work during this period. The average annual growth in publications related to this topic was estimated at 10.04%. Keywords Plus are terms algorithmically generated by databases like Web of Science, Scopus from the titles of cited references, providing additional search

terms beyond the article's content, while Author's Keywords are specific terms chosen by the authors to represent the main topics of their research (Zhang et al., 2016).

5.2. Publications trend

In recent years, sustainable development and CSR have become major research topics, and many related studies associated with the same have been conducted and published over time. Some of the most critical contributions to this area of research have come from such studies. eg the contribution related to sustainability and ethical approaches (Garriga & Melé, 2004), the issue of CSR regarding social welfare (Moon, 2007), the role of CSR in strategy (López et al., 2007), multiple CSR models (Montiel, 2008), the link between CSR and sustainable development (Baumgartner & Ebner, 2010), the role of sustainability within individual companies (Baumgartner, 2014), the relation of poverty with sustainable development (Kolk, 2016), amongst others. Hundreds of papers published within the last three years reflect the depth, opportunities, and potential associated with this subject area.

Figure 3 shows the annual number of publications related to CSR and sustainable development from 1979 to 2024. From here onward, the study only included 1300 works published exclusively in the fields of economics and finance. The number of publications has increased at a consistent annual pace of 10.04% over the past 45 years. In 1979, there was only one publication, whereas by 2023, the total reached 137 publications related to CSR and sustainable development was reached. The publication counts for 2022, which stands at 101, indicates that the topic possesses sufficient depth and potential for further research despite the continuous increase in the number of published papers. The figure demonstrates a consistent upward trend in article publications over time, reflecting growing interest among researchers in CSR and sustainable development.

5.3. Researchers who have made significant contributions

Table 2 presents information on the ten most relevant and influential authors who have significantly contributed to the fields of CSR and sustainable development. According to bibliometric analysis, the table shows the number of papers authored by the top 10 writers in order of highest to lowest for the search criteria 'CSR and sustainable development'. We must realize that the number of articles in the table indicates the contribution of those papers and should not be confused with the number of citations. In productivity analysis, the productivity analysis is covered. We also need to note that there might be significant number of articles on CSR, however, in this analysis, we are considering the combination of CSR and sustainable development. Considering this, the mainstream authors in CSR, may or may not find

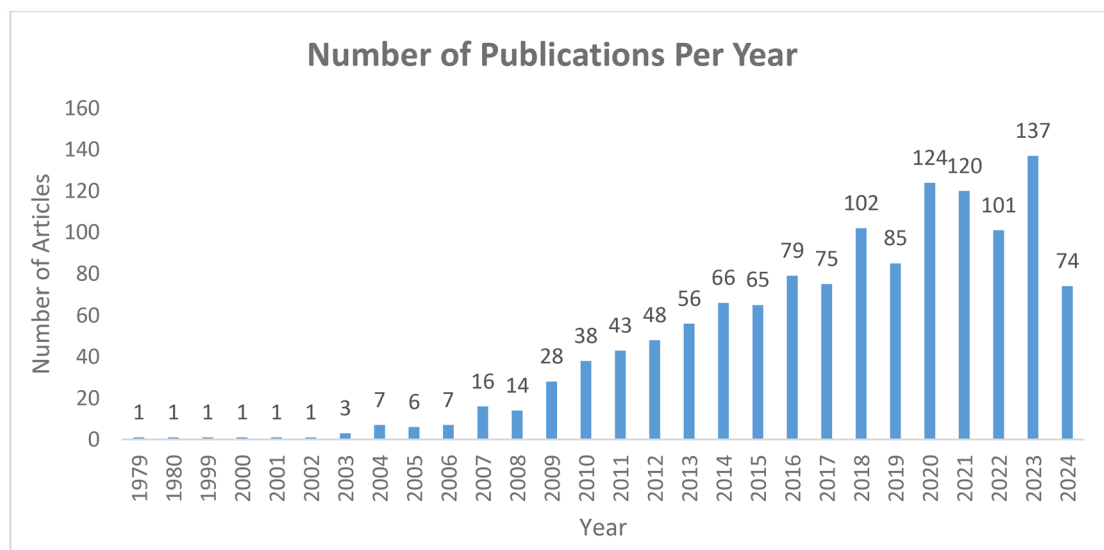


Figure 3. Trend of publications over 45 years (Source: created by authors from Bibliometrix R).

Table 2. Researchers who have made significant contributions.

Authors	Articles	Articles fractionalized
Okolo-Obasi, E. N.	7	2.70
Uduji, J. I.	7	2.70
Yang, Y.	7	2.45
Li, S.	6	1.63
Camilleri, M.A.	5	2.83
Gallardo-Vázquez, D.	5	1.83
Li, X.	5	1.45
Li, Y.	5	1.70
Liu, Y.	5	1.40
Wang, Y.	5	1.70

Source: Created by authors from Bibliometrix R.

Table 3. Author contributions analyzed through productivity statistics.

Element	h_index	g_index	m_index	TC
Okolo-Obasi, E. N.	6	7	1	161
Uduji, J. I.	6	7	1	158
Yang, Y.	6	7	0.75	161
Camilleri, M.A.	5	5	0.5	248
Li, S.	5	6	0.313	342
Li, Y.	5	5	0.5	130
Evangelinos, K	4	4	0.571	65
Gallardo-Vázquez, D.	4	5	0.667	104
Govindan, K.	4	4	0.333	1039
Le, T. T.	4	4	1.333	152

Note: TC: total citations.

Source: Created by authors from Bibliometrix R.

place in the list, depending on how much they have contributed in terms of both the areas. These scholars have played a crucial role in validating established theories through empirical testing and have also contributed to the emergence of new theoretical frameworks in CSR and sustainable development. The table presents the information in order of decreasing importance, having the researcher's name with the greatest contributions being highlighted first. Okolo-Obasi E.N. leads with the most publications since 1973, having authored seven independent articles and co-authored an average of 2.7 articles. Uduji J.I. ranks as the second highest contributor with a score of 9.70, comprising seven solo articles and 2.70 co-authored works. The table effectively acknowledges the contributions of the other authors as well.

5.4. Authors contributions through productivity statistics

The h-index, proposed by Hirsch (2005), measures an author's productivity and impact based on the most-cited publications. The g-index, introduced by Egghe (2006), gives more weight to highly cited articles and is calculated as the largest number, g, of articles that together received at least two citations. The m-quotient, or m-index, is the h-index divided by the number of years since the author's first publication, providing a measure of the author's citation impact normalized by academic age. Based on the authors' h-index values, Okolo-Obasi, Uduji, and Yang share the same h-index. In terms of the total number of citations, Okolo-Obasi E.N. leads with the highest number of citations, closely followed by Uduji and Yang. Table 2 discusses the quantitative aspects of the articles whereas, Table 3 discusses the productivity elements of the articles, noting their value to individuals and society as a whole, as measured by the h, g, and m indices. Details of all authors and their contributions have been mentioned in Table 3.

5.5. Countries linked to corresponding authors

Table 4 lists the nations that the co-authors and corresponding authors are affiliated with.

Publications involving multiple countries and authors are labeled as multi-country publications (MCP), whereas those from a single country are referred to as single-country publications (SCP). The MCP Ratio represents the percentage of total published articles that fall under the category of multicounty publications. The information presented below offers insights into each country's contributions to the research topic and collaboration between authors from different nations.

China is the leader in CSR and sustainable development research, as indicated by the table, which lists 133 published articles in total, 93 of which are published in China, whereas 40 articles, accounting for 30.1%, are multi-country publications. China is considered as a factory of the world and hence it is natural to see that CSR research is done in the industrial complexes and associated sustainable development. The USA has the highest MCP Ratio, indicating the greatest level of multi-country collaboration, whereas Germany and Italy have MCP Ratios of 32% and 31.7%, respectively, suggesting significant international cooperation. Spain and the United Kingdom are also prominent contributors to this research area, although their combined publication volumes are slightly greater than that of China alone. This underscores the much stronger interest and concentration of research on CSR and sustainable development in China.

5.6. Journals with the highest publication rates

The top 10 journals that made significant contributions to research publications on CSR and sustainable development are listed in Table 5. Researchers frequently examine articles from prestigious journals that are pertinent to their field of study to understand the most pressing problems in the field both historically and presently. According to the ranking of peer-reviewed journals based on publication count, the Journal of Cleaner Production has the most papers published on the subject of CSR and sustainable development, closely followed by Sustainability (Switzerland). The last column mentions the origin country of each journal.

We might discover that the list does not include the best CSR-specific journals, such as the International Journal of Corporate Social Responsibility. One of the main causes of this is because the search criteria incorporates both CSR and sustainable development, which may not have been present at first in some of the well-known CSR publications. Topics like sustainable development and SDGs began to appear

Table 4. Countries linked to primary authors.

Country	Articles	SCP	MCP	Freq	MCP_ratio
China	133	93	40	0.102	0.301
Spain	72	52	20	0.055	0.278
United Kingdom	72	51	21	0.055	0.292
USA	53	35	18	0.041	0.34
Australia	46	36	10	0.035	0.217
India	46	43	3	0.035	0.065
Italy	41	28	13	0.032	0.317
Poland	34	32	2	0.026	0.059
Germany	25	17	8	0.019	0.32
Indonesia	25	20	5	0.019	0.2

Source: Created by authors from Bibliometrix R.

Table 5. Journals with the highest publication rates.

Sources	Articles	Scopus category	h index	SJR rank	Country
<i>Journal of Cleaner Production</i>	123	Q1	309	2.06	UK
<i>Sustainability (Switzerland)</i>	120	Q1	169	0.67	Switzerland
<i>Resources Policy</i>	39	Q1	114	2.06	UK
<i>Corporate Social Responsibility and Environmental Management</i>	35	Q1	113	2.2	UK
<i>Social Responsibility Journal</i>	35	Q1	52	0.84	UK
<i>Journal of Business Ethics</i>	30	Q1	253	2.62	Netherlands
<i>Business Strategy and the Environment</i>	14	Q1	147	3.67	UK
<i>Technological Forecasting and Social Change</i>	12	Q1	179	3.12	USA
<i>Journal of Global Responsibility</i>	10	Q2	27	0.61	UK
<i>Sustainable Development</i>	10	Q1	91	2.28	UK

Source: Created by authors from Bibliometrix R.

alongside CSR as the field of CSR developed over time, and the list above prominently features publications that combine CSR with sustainable development.

5.7. Most impactful countries

Table 6 provides information on every nation's average number of citations per article, overall number of citations, and total number of published papers. Spain ranked first, with a total of 246 research publications, accumulating 5229 citations. The USA follows in second place, having published 190 articles, received 4663 citations, and achieved an average of 87.98 citations per article. Spain's leading position in publication citations highlights its significant contribution to CSR and sustainable development, reflecting a higher quality of research. Although countries such as the USA, China, and the United Kingdom have made considerable contributions to the field, their total citation counts fall short compared to Spain.

5.8. Evaluation of citation network

Citations reflect the overall impact of a research article, the journal in which it appears, and the authors within their specific fields. Articles that present innovative research ideas and contribute to the existing knowledge base tend to receive more citations (Niyazov et al., 2016). Table 7 shows the top 10 most-cited research papers on CSR and sustainable development, organized in descending order based on citation counts. The most cited article is 'Corporate Social Responsibility Theories: Mapping the Territory', written by Garriga and Melé (2004), which has garnered 2268 citations. This study demonstrates how CSR programs facilitate the attainment of broader sustainability goals via responsible business practices and stakeholder engagement. Cheng et al. (2014) 'Corporate Social Responsibility and Access to Finance' is the second most referenced paper, with 1909 citations. The authors of these highly cited works are recognized as experts in sustainable development corporate social responsibility.

5.9. Investigation of keyword trends

It is possible to divide a topic into several subfields, each of which can be examined from different viewpoints and methodologies. Existing literature produces a variety of appropriate search terms that underscore the significance of investigations in the field. Therefore, employing keyword analysis allows for thorough comprehension of the extent and depth of the research topic.

5.10. Highest frequency words

Figure 4 illustrates that phrases such as 'sustainability', 'stakeholder' and 'corporate strategy' are often used in the analysis, highlighting their importance in conversations about CSR and sustainable development in the last 45 years. In addition, several prominent terms such as 'social aspects', 'planning', 'economy' and 'economic development' are clearly apparent in the word cloud. These sentences together represent the complex nature of the CSR, including operational elements such as decision making and

Table 6. Most impactful countries.

Country	Frequency	TC	Average article citations
Spain	246	5229	72.63
USA	190	4663	87.98
China	437	3912	29.41
United Kingdom	240	3622	50.31
Australia	131	2587	56.24
Italy	126	1760	42.93
Germany	62	1426	57.04
Denmark	17	1339	133.9
Austria	23	915	152.5
Canada	50	811	38.62

Note: TC: total citations.

Source: Created by authors from Bibliometrix R.

Table 7. Evaluation of citation network.

Article name	Journal	Authors	DOI	Total citations	TC per year
'Corporate Social Responsibility Theories: Mapping the Territory'	<i>Journal of Business Ethics</i>	Garriaga and Melé (2004)	10.1023/B:BUSI.0000039399.90587.34	2268	108
'Corporate social responsibility and access to finance'	<i>Strategic Management Journal</i>	Cheng et al. (2014)	10.1002/smj.2131	1909	173.55
'A fuzzy multi criteria approach for measuring sustainability performance of a supplier based on triple bottom line approach'	<i>Journal of Cleaner Production</i>	Govindan et al. (2013)	10.1016/j.jclepro.2012.04.014	826	68.83
'An exploration of measures of social sustainability and their application to supply chain decisions'	<i>Journal of Cleaner Production</i>	Hutchins and Sutherland (2008)	10.1016/j.jclepro.2008.06.001	718	42.24
'The boundaries of strategic corporate social responsibility'	<i>Journal of Consumer Marketing</i>	Lantos (2001)	10.1108/07363760110410281	700	29.17
'The false developmental promise of Corporate Social Responsibility: evidence from multinational oil companies'	<i>International Affairs</i>	Frynas (2005)	10.1111/j.1468-2346.2005.00470.x	537	26.85
'Corporate Social Responsibility Reports: A Thematic Analysis Related to Supply Chain Management'	<i>Journal of Supply Chain Management</i>	Tate et al. (2010)	10.1111/j.1745-493X.2009.03184.x	531	35.4
'Corporate sustainability strategies: sustainability profiles and maturity levels'	<i>Sustainable Development</i>	Baumgartner and Ebner (2010)	10.1002/sd.447	525	35
'Corporations, Stakeholders and Sustainable Development I: A Theoretical Exploration of Business–Society Relations'	<i>Journal of Business Ethics</i>	Steurer et al. (2005)	10.1007/s10551-005-7054-0	500	25
'Social license and mining: A critical perspective'	<i>Resources Policy</i>	Owen and Kemp (2013)	10.1016/j.resourpol.2012.06.016	489	40.75

Source: Created by authors from Bibliometrix R.

broader social implications. This equitable representation emphasizes the interrelation of business objectives with social and economic elements to achieve sustainable development.

5.11. Co-occurrence based keyword networks

Keywords are typically found in research articles following the abstract and serve to highlight key topics or concepts related to the study. Each research article typically includes six to eight keywords. Over time, some important terms frequently appear in different research publications; this is a phenomena called 'keyword co-occurrence'. Researchers can gain greater analytical insight into this event.

It helps to identify some of the important subfields of study within a given area and illustrates the relationships between different subfields. Consequently, this enhances the understanding of key co-occurring keywords relevant to a particular domain. The co-occurrence of the keywords linked to CSR



Figure 4. Term frequency display or word cloud.

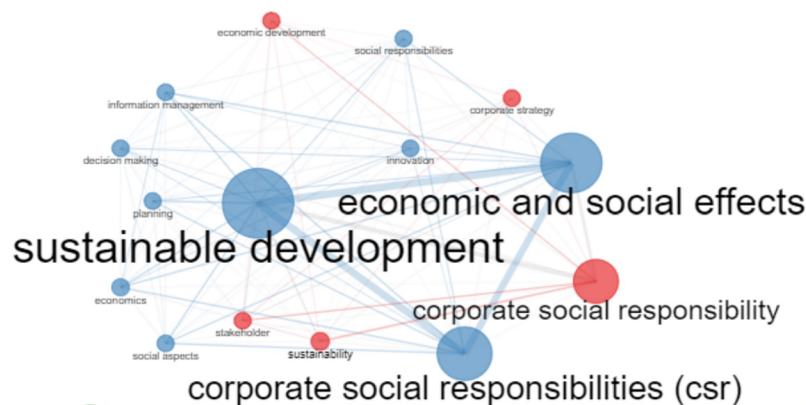


Figure 5. Keyword co-occurrence.

and sustainable development is shown in Figure 5. The Keyword Co-Occurrence Network accompanied with Figure 5 emphasizes the connection of the main concepts in the Bibliometric analysis of Corporate Social Responsibility (CSR) and sustainable development. The centrality of 'sustainable development' in the network indicates its central role in discourse, closely related to concepts such as 'economic and social effects', 'corporate social responsibility' and 'corporate social responsibility (CSR)'. The size of the nodes reflects the frequency of the use of the words, with larger nodes such as 'sustainable development' and 'economic and social effects' that represent prominent themes. The connections between different nodes is represented with lines, that illustrate the relationship between simultaneous occurrence and emphasize the interdisciplinary nature of CSR and its integration with economic, social and strategic aspects of sustainability. This graphic shows how closely corporate social responsibility initiatives support more broad objectives for sustainable development.

5.12. Three-fold plot

Regarding CSR and sustainable development, the three-fold map in Figure 6 illustrates the connections among the authors (AU), source of publishing (SO), and keywords used by scholars (DE). These data are valuable for identifying leading authors in the field as well as key subtopics that can be explored through the authors' keywords, making it possible to seek their guidance and collaboration. Additionally, the threefold plot reveals information about reputable journals associated with these publications. The journal listings can assist in identifying potential outlets for future research submissions in the same area.

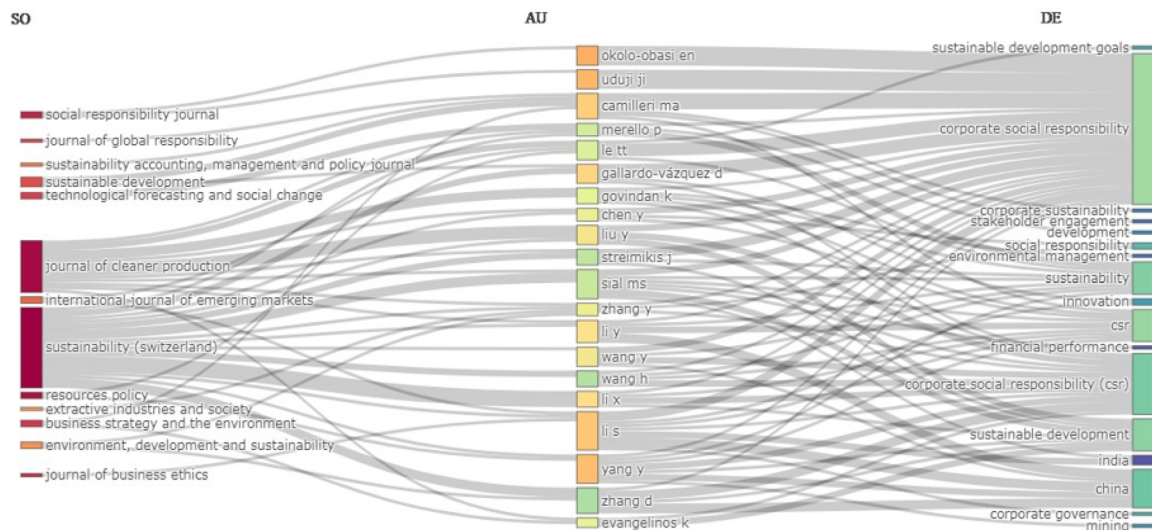


Figure 6. Three-fold plot.

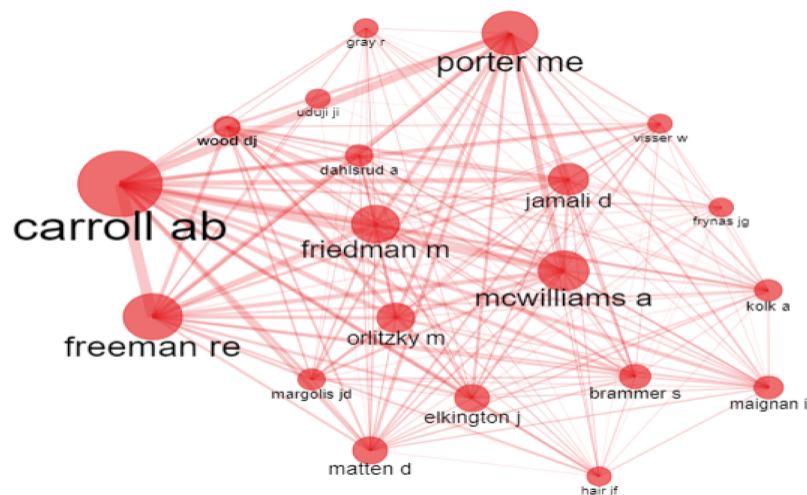


Figure 7. Co-citation analysis.

5.13. Analysis of co-cited literature

A bibliometric technique called co-citation analysis looks at how frequently two documents are cited jointly by other works. It gives details on the intellectual framework and research patterns in a certain field, which aids in determining connections between publications, authors, or subjects based on shared citations. This method is frequently employed to map the body of knowledge and identify key works or thematic groupings (Small, 1973). One thing to keep in mind when conducting co-citation analysis is that it represents teamwork and collaborative citation activity by several writers. This may not always reflect the most referenced publications or authors. Thus, the papers given here may not have shown in the previous analysis since they were not at the top of the joint citation or author analysis; nonetheless, they are significant in terms of collaboration, as evidenced by the co-citation analysis discussed below.

The co-citation analysis of CSR and sustainable development is shown in Figure 7. Initially, 3075 authors were included in this analysis. Disconnected nodes representing independent articles were excluded. Larger types and node sizes indicate more co-citations submitted by authors. The Figure 7 indicates the top five authors, ranked in order, who contributed to multiple publications across their careers: Carroll, Freeman, Porter, McWilliams and Friedman.

6. Network analysis

6.1. Data clustering

In the case of bibliometric analysis, data clustering has emerged as an essential ingredient that allows for the relationship as well as connectivity specification across large aggregates of scholarly articles. Then, by using different clustering methodologies, the authors organized literary works with networks representing thematic authorship and citation networks. This brings new trends and insights to specific fields of study. As observed by Cendana and Kuo (2024), the implementation of this method opens the field of research and helps one to grasp the character of information structures.

This study mostly used bibliographic coupling to group items according to shared references, hence the bibliometric clustering analysis was conducted using the Bibliometrix R package. This approach performs effectively in identifying thematic connections between the study of corporate social responsibility (CSR) and sustainable development. Following important characteristics were applied in the clustering process: the cluster labeling based on Keyword Plus, the influence shown by the Local Citation Score (LCS), and the coupling evaluated by references. These criteria assured that instead of arbitrary comparisons, clusters would reflect original theme domains depending on common intellectual underpinnings.

The investigation was limited to the top 250 most relevant publications depending on citation impact to boost focus and dependability using a minimum cluster frequency of two papers per cluster. This strategy guarantees openness and repeatability and provides significant understanding of the organization of CSR and sustainable development research. This clarity helps researchers to correctly understand and use the conclusions in their own work (Waltman et al., 2010).

Research on corporate social responsibility and sustainable development can be divided into two categories. Cluster 1 discusses distinct aspects of corporate social responsibility and sustainable growth. viz. (a) the understanding of the intersection between technology, CSR and sustainable development by analyzing the effectiveness of innovative solutions like spatiotemporal analysis, (b) how integrating open innovation strategies with CSR can drive sustainable development by aligning SDG objectives to enhance overall corporate performance, (c) ethical decision-making and stakeholder engagement in CSR and sustainable development, (d) how effective CSR strategies can enhance brand loyalty and contribute to sustainable development, (e) how alignment of CSR and green innovation can enhance and contribute to sustainable development, (f) how CSR adoption, driven by compliance with regulations, stakeholder awareness, environmental protection, and ethical values, can enhance sustainable development, (g) importance of ethical motivations for firms to effectively contribute to sustainable development rather than solely relying on economic incentives, (h) how effective CSR practices can enhance sustainability efforts and drive long-term value creation for businesses, (i) sustainable development by fostering a culture of shared responsibility and collective action and (j) adoption of responsible practices for reputation enhancement and sustainable development.

Cluster 2, as mentioned in Table 8, mainly discusses the following aspects in relation to CSR and sustainable development: (a) how CSR initiatives can be effectively aligned with sustainable development goals, highlighting the importance of strategic integration; (b) how integrating CSR into business

Table 8. Cluster analysis.

Cluster 1	Cluster 2
S. Singh et al. (2024)	Brinette et al. (2024)
Camilleri et al. (2023)	Tiep Le et al. (2023)
Hao et al. (2024)	Iqbal and Piwowar-Sulej (2024)
Y. Wang et al. (2024)	Hsu and Chen (2024))
Pham et al. (2023)	Poveda-Pareja et al. (2024)
Li and Chen (2023)	Sun et al. (2024)
Bux et al. (2024)	B. Wang et al. (2024)
Smith (2024)	Chauhan (2023)
Al-Mamun and Zaman (2023)	Jha and Dash (2023)
Bhargava and Ligade (2023)	Le (2023)
Mendes et al. (2023)	Abramovich and Vasiliu (2023)
Shiri and Jafari-Sadeghi (2023)	Indarto et al. (2023)
Atif et al. (2024)	Fonseca et al. (2023)
El-Said et al. (2023)	Tiep Le et al. (2023)
Hung et al. (2023)	Adams et al. (2022)

Source: Created by authors from Bibliometrix R.

strategies can enhance sustainable development by fostering innovation and effectively addressing social challenges; (c) how stakeholder engagement in CSR helps in sustainable development; (d) how collaboration between businesses and communities can help in sustainable development; (e) how sustainable development and CSR programs can work together to improve long-term societal benefits and organizational sustainability; (f) how fostering ethical practices and enhancing stakeholder trust within organizations help in sustainable development; (g) how to employ integrated approaches that successfully address ecological and social issues; (h) ways to use CSR activities to have long-lasting positive effects on the environment and society; (i) how generating shared value benefits society and the business contributes to sustainable development and (j) how promoting environmental stewardship, social responsibility, and economic growth can lead to sustainable development.

7. Conceptual framework

Inspired by insights derived from bibliometric analysis and thematic mapping of the current literature, the conceptual framework of this research aims to provide an extensive relationship between Corporate Social Responsibility (CSR) and sustainable economic development (Tranfield et al., 2003). This paradigm is a reflective synthesis of important subject clusters—including stakeholder involvement, sustainability integration, and innovation—rather than a mere reciter of earlier research to study how CSR projects could drive economic development. Using bibliometric approaches, the conceptual framework of CSR research is examined exposing significant intersections and growing trends stressing the dynamic relationship between corporate activities and developmental results.

Since the authors created this concept by painstaking bibliometric data investigation rather than directly replicating from previous works, it is original. It offers an analytical framework that can direct next research and action on the complex interplay between CSR and sustainable development, therefore transcending simple descriptive analysis. Acting both a theoretical and a practical instrument, it emphasizes the need of CSR in driving economic growth while solving more broad environmental issues.

Figure 8 illustrates a conceptual framework of CSR practices and sustainable development based on interconnected CSR activities, which consequently yields socioeconomic benefits. It is based on some sophisticated tenets viz. successful CSR measurements, such as environmental sustainability programs, labor ethical standards, commitment to the community, and high stakeholder engagement. Some of them include employees, customers, suppliers, and communities. It creates cooperation, whereby the firm may need to respond to societal needs. Customers' confidence and loyalty have increased, as has brand image, which is essential for sustainable business.

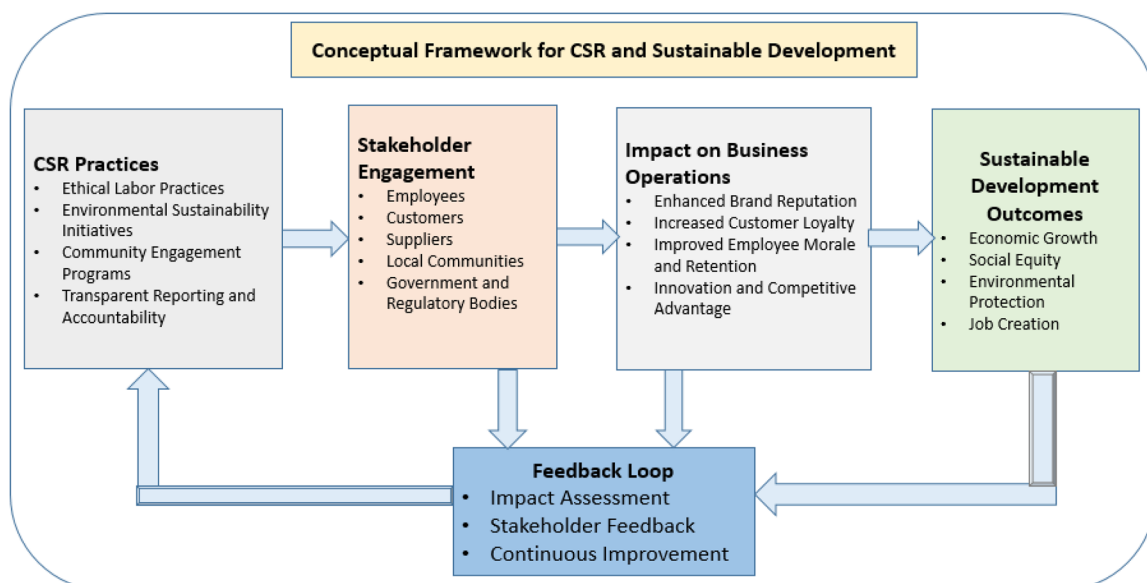


Figure 8. Conceptual model for CSR and sustainable development.

Depending on a company's operations, the integration of CSR practices has considerable effects on the economy. Better brand recognition and loyal customers lead to improved overall performance, which in turn helps firms make more investments in sustainability. Accomplishing this requires a long-term investment in a business with the byproduct of creating jobs, increasing GDP, and providing social equity that could, in the long run, provide a more long-term sound business model. One important result that is underlined is job creation since it provides a concrete link between CSR projects and their wider social effects. Although it interacts with other results like social equity and economic growth as well as other important pillars of sustainable development, its focus reflects its central importance in tackling unemployment, and promoting community development, and guaranteeing sustainable livelihoods (Dahal et al., 2024). This emphasis also fits Sustainable Development Goal 8, which gives decent work and economic growth through job possibilities a top priority (Rai et al., 2019). The feedback loop in the model indicates that it is essential to quantify the effectiveness of CSR activities and integrate the feedback of stakeholders in altering strategies. This involves a cyclical approach in the undertaking of CSR, as CSR tends to make CSR efforts more appropriate when responding to new societal issues. In summary, the model above shows that if companies uphold their ethical responsibilities, they must incorporate strong CSR, which allows them to offer their maximum contribution to the enhancement of sustainable development, thus ensuring that stakeholders reap big through CSR practices.

8. Key findings from the research

The findings of this bibliography analysis show that CSR and sustainable development research is developing toward further integration of technical and stakeholder-centered approaches. For academics, this indicates the need for more interdisciplinary research that combines advanced analytical tools with traditional principles. Practitioners can use these insights to create a more transparent and moral CSR strategy, while policy-makers should focus on promoting research and cooperation in undeveloped regions. Ultimately, this study highlights the possibility of bringing a meaningful social change to CSR when aligned with global durability targets and supported by strong, reference-specific research.

9. Discussion and conclusion

From the results, it is possible to understand that a bibliometric analysis of Corporate Social Responsibility (CSR) and sustainable development should be approached systematically. Researchers have employed a sense-making approach consisting of three stages: scanning, sensing, and substantiation (Lim & Kumar, 2024)

Most bibliometric analyzes involve different steps. The results show that literature on CSR and sustainable development is partly produced by many types of studies. These range from theoretical publications that indicate frameworks such as stakeholder theory or institutional theory for empirical studies that emphasize case studies and field experiments into mixed methods Research that integrates qualitative and quantitative methods. Sharma and Sathish (2022) help us understand the relationship between CSR and sustainable development by using qualitative analysis, while Fatima and Elbanna (2023) helps us to understand the similar relationship by using the quantitative techniques. The variety in the methodology helps us to confirm the the relationship between CSR and sustainable development by using different approaches. By using these techniques, we get an idea about the journal analysis, citation analysis, coupling analysis, and computation analysis. This paves the way for the subsequent sensing phase to ensure that the analysis is based broadly.

The sensing stage entails the application of the 'What', 'Why' and 'How' frameworks to build possible why's from the outcome. This translates into a better and more comprehensive way of understanding bibliometric results by revealing what is identified as known unknown, unknown, and emergent attributes.

The substantiating stage also assists in boosting the conviction of the findings using procedures such as credibility, conformity, transferability, and dependability. This enhances the visibility of the study; therefore, more scholars and business gurus will utilize this study.

9.1. Scanning

CSR and sustainable development are well-explored areas associated with a growing number of publications, emphasizing their importance and potential. To provide a clear context and define research boundaries, this article presents a bibliometric examination of 1300 scientific publications produced over the course of 45 years (1979–2024), sourced using Scopus, and following a comprehensive literature study.

The analysis reveals that China stands out as the leading contributor to CSR and sustainable development research, with 437 publications, followed by Spain, with 246. Other than China, emerging market nations have not made much contribution to this sector. An analysis based on citations reveals that the most influential authors in CSR and sustainable development research include Okolo-Obasi, Uduji, and Yang, indicating that the majority of impactful research originates from established nations and suggests limited input from emerging markets.

Additionally, a keyword-based analysis identifies ‘Sustainability’, ‘Stakeholder’, ‘Corporate Strategy’, ‘Economic Development’, ‘Decision Making’, and ‘Planning’ as key dimensions of CSR and sustainable development research. Co-occurrence analysis of keywords further indicates that terms like ‘Corporate Social Responsibility’, ‘Sustainable Development’, and ‘Economic and Social Effects’ are closely related to the field. The cluster analysis revealed that the latest trends, such as the SDGs, spatiotemporal analysis of supply chain sustainability, climate change, and decision making, have emerged as new subthemes under the broad themes of CSR and sustainable development.

9.2. Sensing

Based on a bibliometric analysis of CSR and sustainable development research, it is possible to identify two significant clusters. Cluster 1 includes the implementation of technology, CSR, and sustainable development (SD) in organizations, stressing the efficiency of innovative solutions such as spatiotemporal analysis.

Although bibliometric analytic approaches form the conceptual framework for this study, it is important to define the theoretical foundations of CSR and sustainable development research. In this field theoretical frameworks such as triple bottom line (Elkington, 1999), institutional theory (DiMaggio & Powell, 1983), and stakeholder theory (Freeman, 1984) often find resonance. These ideas offer a view on how companies strike a balance between environmental preservation and social responsibility against corporate performance. Huynh et al. (2024) explain how institutional forces affect business acceptability of CSR activities. Future research could integrate these ideas with other ideas like circular economy or digital transformation. It also discusses how open innovation controls can be incorporated with CSR to support the advancement of the sustainable development goals or SDGs by optimizing the goals together with the corporate outcome. Furthermore, this cluster provides insight into ethical decision-making and the understanding of stakeholders, together with efficient strategies in the sphere of CSR. This would improve brand loyalty and contribute to society and sustainable development. The second cluster mostly focuses on aligning CSR with SDG’s aims, thereby underlining the further incorporation of CSR into diverse business initiatives to create value and respond to social problems effectively. Furthermore, it implies that the focus on the relationships between the business and stakeholders, learning from the role of ecosystems, and practicing in ethical ways that make businesses better prepared for future challenges will contribute toward positive societal change. Speaking of the priorities of both clusters, they focus on the development of the concept of shared value and call for environmental protection and social and economic development of society for sustainable development.

9.3. Substantiating

A review of the most frequently cited articles in popular journals gives credence to corporate social responsibility (CSR) and sustainable development (Bamel et al., 2024). The reliability of these articles can be ascertained by assessing the extent of geographical coverage and the major organizations and research centers involved in studies on CSR and sustainable development (Varma et al., 2023). In this context, bibliometric coupling provides significant support for this co-citation analysis in this field (Donthu et al., 2023).

Several steps can be taken toward create conformity in the analysis of CSR and sustainable development through a broad review of the subject matter, with the help of valid bibliometric methodology and adequate

citations (Kumar et al., 2022). With regard to sustainable development and CSR, credibility and conformity have already been discussed, which helps shed light on the temporal over-reliance on existing reviews (Lim et al., 2022). The findings from the bibliometric analysis of sustainable development and CSR are essential and help in the application of the findings in other related fields, such as SDGs and CSR, which are practiced by relevant entities (Lim et al., 2023). The bibliometric analysis shows new domains in the area of CSR and sustainable development research. The upcoming themes are associated with the use artificial intelligence to improve CSR strategies, use of spatiotemporal sustainability analysis for the supply chain management and check the actual contribution of CSR to specific sustainable development goals viz equality and climate acting. Additionally, researchers can use interdisciplinary methods which normally combine behavioral traits with CSR decisions will also receive prominence. Donthu et al. (2023) propose that integration of AI-driven analysis has prospect to improve the overall transparency and responsibility of the company. These fresh concepts make it abundantly evident that sustainable development and corporate social responsibility are increasingly popular and can assist to solve major global issues. Bibliometric analysis forms the fundamental concept of this work. Thus, it is crucial to clarify the ideas driving research on sustainable development and corporate social responsibility. Commonly cited in this sector are theoretical frameworks which include institutional theory (DiMaggio & Powell, 1983) stakeholder theory (Freeman, 1984) and the triple bottom line (Elkington, 1999). These concepts provide a structure for studies on how businesses balance social responsibility and environmental care with economic performance.

The scanning phase highlights the major contribution from countries such as China, while an under-utilization of the technological resources of developing economies reveals that these gaps can be filled in future as a part of future research agenda for developing countries through cross-comparative analysis.

Two primary topic clusters emerge regarding sensing: one centers on the importance of technical innovation in promoting SDGs through CSR activities, while the other highlights ethical decision-making and stakeholder engagement as means for societal effect. These clusters strongly correspond with known theories such as stakeholder theory while also indicating innovative frameworks that integrate technology with sustainability objectives.

Finally, validating results using co-citation analysis demonstrates strong academic networks while also indicating potential to enhance geographical representation in significant research. The amalgamation of bibliometric approaches with sophisticated analytical instruments such as AI could augment our comprehension of these domains.

9.4. Key novel areas in CSR and sustainable development research

Recent developments in sustainable development research and corporate social responsibility (CSR) point that the use of Integrating technology viz. AI, Blockchain, and spatiotemporal analytics will definitely help to improve supply chain transparency. It will also help to track environmental hazards and help to track the company and country performance in comparison with the worldwide sustainability targets like the SDGs. Scholars underline the need of going beyond profit-centric models by giving ethical frameworks that balance stakeholder welfare with shared value creation top priority, hence countering criticisms of shallow 'greenwashing'. The study also emphasizes the importance of context-specific research in underdeveloped areas (eg Africa, South Asia) and high-impact industries (eg energy, mining) to address governance shortages and localized difficulties. While cross-sector alliances and regulatory incentives become drivers for scalable effect, emerging approaches include bibliometric analysis and longitudinal investigations expose changing intellectual landscapes. Furthermore, changing corporate strategy are consumer-brand dynamics including CSR-driven loyalty and behavioral analytics. This changing paradigm demands flexible, multidisciplinary solutions that link corporate goals with social resilience, therefore providing practical routes for fair, long-term development.

In conclusion, it can be said that the combination of CSR and sustainable development is commonly considered as vital for tackling worldwide concerns including as scarcity, uneven distribution of services and products, and climate change. Overall, a rather solid body of published work can be identified as addressing these themes in some capacity; however, this bibliometric analysis indicates that there is still room for more extensive and solid research that investigates CSR effectiveness in attaining SDG. Further research should be conducted with longitudinal and cross-sector research studies to ascertain the ways in which CSR impacts sustainability. In this way, discovering more profound links between these concepts, scholars, and practitioners

can help enhance the practice of different strategies that integrate business activities and sustainable development in general, to create a world that will be more sustainable and equitable.

10. Future research agenda

The latest developments in including CSR into sustainable development have clearly expanded the field of research in this direction. Effective means for exposing intellectual frameworks, identifying new trends, and projecting future research paths are shown by using this bibliometric analysis. Using a thorough bibliometric approach, co-citation analysis to assess past research, bibliometric coupling to investigate the present state of the subject, and trend topic analysis to project future trajectories, this future research agenda has been constructed. These approaches when used together help to fully understand the direction and evolution of CSR as well as sustainable development research.

By synthesizing results from the bibliometric review, this research agenda offers a methodical strategy to close important gaps in the literature. Authors have selected those gaps with relevance, citation impact, and correspondence with developing issues in CSR and sustainable development research. This method guarantees that the suggestions for future research are based on solid evidence and take into account both historical context and modern advancements. Table 9 presents these promising avenues, providing scholars with a systematic framework for enhancing understanding in this interdisciplinary domain.

Table 9. Future research agenda.

Relevant research articles	Questions associated with future research agenda
'Scoping the Evolution of Corporate Social Responsibility (CSR) Research in the Sustainable Development Goals (SDGs) Era (ElAlfy et al., 2020)'	• How can businesses assess the real impact they are making on the SDGs through CSR initiatives? • What frameworks can be developed to increase the participation of stakeholders in the strategic CSR models' implementation? • What are the best ways to encourage financial institutions to take a more proactive stance in advancing CSR that is in line with sustainable development? • What exactly are the most effective ways to incorporate CSR into different industry business models in order to promote global sustainability? • How can research on CSR be expanded in under-researched areas to better understand its impact on sustainable development?
'Corporate Social Responsibility, Sustainability, Sustainable Development, and Corporate Sustainability: What Is the Difference, and Does It Matter? (Sheehy & Farneti, 2021)'	• How can organizations effectively differentiate between CSR, sustainability, and corporate sustainability in their strategic planning? • How does corporate governance influence CSR strategies that support sustainable development? • How can companies use their CSR programs to generate value that benefits society and their bottom line at the same time? • What measures ought to be put in place to assess how well CSR efforts contribute to the realization of sustainable development? • How may international cooperation between companies improve the effect of CSR on SDGs?
'Corporate Social Responsibility (CSR): The Role of Government in promoting CSR (Wirba, 2023)'	• What policies can governments implement to incentivize companies to adopt more robust CSR practices globally? • How should public-private partnerships be set up to best use corporate social responsibility (CSR)'s benefits for sustainable development? • What are the barriers to effective government involvement in promoting CSR, and how can they be overcome? • How can governments facilitate knowledge sharing among corporations to enhance CSR initiatives for sustainable development? • What role do international regulations play in shaping CSR practices across different countries?
'Corporate social responsibility and sustainable development goals: evidence from responsible business leaders (Leena et al., 2024)'	• How can CSR initiatives be standardized globally to ensure consistency in their contribution to sustainable development? • What creative strategies can companies use in a world that is changing quickly to match their CSR initiatives with the SDGs? • How can companies effectively engage with local communities to ensure their CSR initiatives address real societal needs? • What impact does consumer behavior have on the effectiveness of CSR initiatives in promoting sustainable development? • How can technology be used to improve CSR practices' accountability and transparency?
'Sustainable Development Goals (SDGs) as a Framework for Corporate Social Responsibility (CSR) (Fallah Shayan et al., 2022)'	• How can synergies between CSR and the SDGs be effectively communicated to stakeholders to enhance engagement? • What are the key challenges companies face when trying to align their CSR strategies with the SDGs, and how can they be addressed? • How can companies evaluate how their CSR efforts affect the results of sustainable development over the long run? • What role does corporate culture play in shaping the effectiveness of CSR initiatives aimed at achieving the SDGs? • How can cross-sector partnerships be fostered to enhance the collective impact of CSR on global sustainability challenges?

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Author contributions

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Data availability statement

The data supporting the findings of this study are available from the corresponding author, GJ, upon reasonable request.

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