



Sustainable Supply Chain Management in the Context of Small and Medium-Sized Enterprises: A Literature Review and Bibliometric Analysis

Gestión sostenible de la cadena de suministro en el contexto de las pequeñas y medianas empresas: revisión bibliográfica y análisis bibliométrico

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Abstract

Context: Organizations must strategically address sustainability pressures. In this sense, it is considered that their responses tend to be more effective when adopted at the supply chain level. This approach is framed within the topic of sustainable supply chain management (SSCM), which integrates the environmental and social objectives inherent to sustainability.


Objective: To determine the current status of SSCM in small and medium-sized enterprises (SMEs), given its importance to sustainability and the economy


Methodology: This work uses bibliometric analysis and the Tree of Science, which allows identifying topics, authors, and outstanding journals, as well as the seminal works and the perspectives of development in this area.


Results: The results suggest that it has become a topic of growing interest for the academic community, mainly in Asian countries. Likewise, the considered articles are published in highly recognized journals, and the most cited topics refer to the environmental dimension.

Conclusions: Delving into the particularities of SSCM in SMEs contributes to the academic debate to support the path towards sustainability in this type of organization, which face their own challenges, given their characteristics, resources, and capabilities.

Keywords: sustainable supply chain management, small and medium-sized enterprise, sustainability, literature review, bibliometrics, Tree of Science

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Resumen

Contexto: Las organizaciones deben abordar estratégicamente las presiones de la sostenibilidad. En este sentido, se considera que sus respuestas tienden a ser más efectivas cuando se adoptan a nivel de la cadena de suministro. Este enfoque se enmarca en la gestión sostenible de la cadena de suministro (SSCM), que integra los objetivos ambientales y sociales inherentes a la sostenibilidad.

Objetivo: Determinar el estado actual del área de SSCM en las pequeñas y medianas empresas (pymes), dada su importancia para la sostenibilidad y la economía.

Métodología: Este trabajo utiliza el análisis bibliométrico y Tree of Science, que permite identificar los temas, autores y revistas destacados, así como los trabajos seminales y las perspectivas de desarrollo de esta área.

Resultados: Los resultados sugieren que este se ha convertido en un tema de creciente interés para la comunidad académica, principalmente en los países asiáticos. Asimismo, los artículos considerados se publican en revistas de gran reconocimiento, y los temas más citados se refieren a la dimensión ambiental.

Conclusiones: Profundizar en las particularidades de SSCM en las pymes contribuye al debate académico para apoyar el camino hacia la sostenibilidad de este tipo de organizaciones, ya que ellas afrontan sus propios retos, dados sus características, recursos y capacidades.

Palabras clave: gestión sostenible de la cadena de suministro, pequeña y mediana empresa, sostenibilidad, revisión bibliográfica, bibliometría, Tree of Science

Introduction

Sustainable development is one of the main drivers that have shaped the late 20th century [1] at its political foundations since the publication of the Brundtland report in 1987. In conceptual terms, one stream of literature highlights that and have been used interchangeably in many cases, and that, although they are deeply related, they are distinct [2], [3]. However, there seems to be consensus on the fact that, in both cases, they include environmental, economic, and social dimensions, between which there are deep tensions and complexities [4].

In the business context, has been defined in several ways [5]. One of them considers actions aimed at minimizing the negative impacts of a business on people, society, and the environment while maintaining or enhancing value for customers and other stakeholders [6]. Broadly, it involves the resilience of organizations over time when they are closely connected to healthy environmental, economic, and social systems, placing them in a better position to respond to internal and external shocks [5].

These corporate sustainability concerns have been extended to the field of supply chain management (SCM), which is attracting the attention of the academic and business world [6], mainly under the knowledge domains of green supply chain management (GSCM) and sustainable supply chain management (SSCM). For many authors, SSCM constitutes a broader approach than GSCM by integrating social aspects with economic and environmental ones in a triple-bottom-line view [5], [7].

In the field of SSCM, the existence and contributions of previous research stand out: there are those offering conceptual frameworks [5], [8], those employing bibliometrics as their main methodology [9]–[12], and those focusing on the specific context of developing countries [13], among others. Despite the number and importance of said contributions, review works focused on small and medium-sized enterprises (SMEs) are still limited [14], even though the impact of these organizations on sustainable development has been recognized, as well as the need for specific solutions to improve sustainability performance, given the differential characteristics of these entities [15].

Thus, research should pay more attention to SMEs, not only because of their importance for achieving sustainable outcomes, but also because their aggregate impacts are likely to be considerable [13]. According to the Organization for Economic Co-operation and Development (OECD), SMEs are the predominant form of enterprise, representing 99% of the total [14].

In light of the above, the main purpose of this document is to map the scientific literature published on the topic of SSCM in SMEs. Specifically, the questions that guide the review are the following:

- What are the main thematic axes?
- Which are the authors, journals, institutions, and countries with the most contributions?
- Who are the seminal authors and who represents the current perspectives?
- Who are the authors with the highest number of contributions?

The following paragraphs highlight the theoretical elements of sustainability and its relation to the management of organizations and supply chains, especially in the context of SMEs.

Sustainability and sustainable development

In academic terms, it stands out that, since the late 1990s, there has been a considerable increase in the number of publications related to sustainability [7]. Despite this, some authors, such as [3], consider that it is still necessary to clarify the concept and use of the terms *sustainability* and *sustainable development*, which have been erroneously used as synonyms [2], [3].

One of the proposals for this conceptual difference was established by [2], who emphasized that sustainability ensures, in the long term, that our planet can meet the material and energy needs to sustain complex systems—including humanity—and that this has economic implications, derived from the consumption of resources, and social implications, since the ultimate goal is to meet society's needs. Sustainable development, on the other hand, provides a vision of how society should be developed in harmony with the environment and adds a greater focus on social dimensions such as intergenerational equity [2].

At the political level, the sustainable development framework was popularized in the 1980s with the most cited definition in the literature, which was given in the Brundtland Report of the World Commission on Environment and Development [1], [17], [18]: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (p.8) [19]. This commission is recognized for opening a discussion—in a detailed, documented, and meaningful way—on social and environmental issues, as well as on the risks faced by humanity [20]. In recent years, the most relevant sociopolitical event occurred in September 2015, when UN member countries agreed on a universal agenda for sustainable development, which consists of 17 goals and 169 associated targets.

This political context is important but needs to be operationalized for companies [21]. In this sense, while social actors have defined the agenda, companies must implement it, as they represent the productive resources of the economy [22]. This has shaped the notion of *corporate sustainability* (CS) [4], which emphasizes the interactions between economic, environmental and social values [23]. Currently, the debate is focused on the concept and its implications in the business context. While there is no consensus on a definition of CS, it is recognized that “corporate growth and profitability are important, [but] it also requires that the corporation pursue social goals, specifically those related to sustainable development—environmental protection, social justice and equity, and economic development” Wilson 2003, p. 1, cited for [4].

According to [5], the definitions of CS and *corporate social responsibility*, which cannot be used as synonyms for one stream of literature, share many aspects in common: they focus on an integrated view of the triple bottom line, address the needs of key stakeholders, assume a long-term perspective, and start from the need to build resilient organizations. Many of their related initiatives are voluntary.

SC performance has moved from a perspective based on individual company actions to the link with SCM [24]. Thus, organizations know that all aspects of SCM are more important than ever and pay strategic attention to them [25]. With these aspects in mind, the next subsection provides a framework for sustainable SCM.

Sustainable supply chain management

This awareness has given rise to the knowledge domain of GSCM, defined as integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life [26, p. 54-55].

As stated in the literature, GSCM mainly focuses on economic and environmental dimensions. Thus, the consideration of social aspects is included in the concept of SSCM, which represents a progression of GSCM and a dominant research domain since 2010 [7]. Although there are several definitions of SSCM, the most commonly cited [5] are as follows:

as the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements. [8, p. 1700] as the strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key interorganizational business processes for improving the long-term economic performance of the individual company and its supply chains. [17, p. 368]

There are at least two positions in the literature. In the first, the boundaries between SSCM and GSCM are still nuclear [5], [27]. In the second, SSCM is an evolution of GSCM that integrates environmental, economic, and social dimensions in SCM [7].

Sustainable supply chain management in SMEs

The study of sustainability in the supply chain has focused mainly on large companies, which are generally subject to greater pressure from stakeholders, demanding that they make their products and operations environmentally sustainable [28]. In the case of SMEs, academic research is still in development, and more studies, analyses, and discussions are required to develop the theoretical framework of GSCM [29].

According to [30], firm size influences the decision to allocate resources and capabilities for the implementation of GSCM. In the case of SMEs, the findings are not generalizable; some have found that, due to their various limitations, it is too difficult to effectively adopt GSCM strategies [29], and others suggest that, compared to large companies, SMEs have greater flexibility and ease in achieving social and environmental objectives, and that this requires the development of strategies which are appropriate to their characteristics.

According to [28], in a SCM framework, SMEs have limited human and financial resources for activities including supplier development and certification, as well as reduced bargaining power in negotiations with their suppliers. In addition, they face fewer pressures for environmental awareness. On the other hand, the adoption of GSCM practices by smaller companies can leverage the knowledge and resources of their large supply chain partners.

Within the current framework, and to achieve the purposes of our literature review, this document is organized into the following sections: the methodology for gathering, organizing, and analyzing the information, including search criteria and document selection; the findings; and the conclusions of the review.

Methodology

As shown in Fig. 1, the methodology for our literature review followed two stages: (i) the search and selection of documents, and (ii) the analysis of the information using the Tree of Science and bibliometrics.

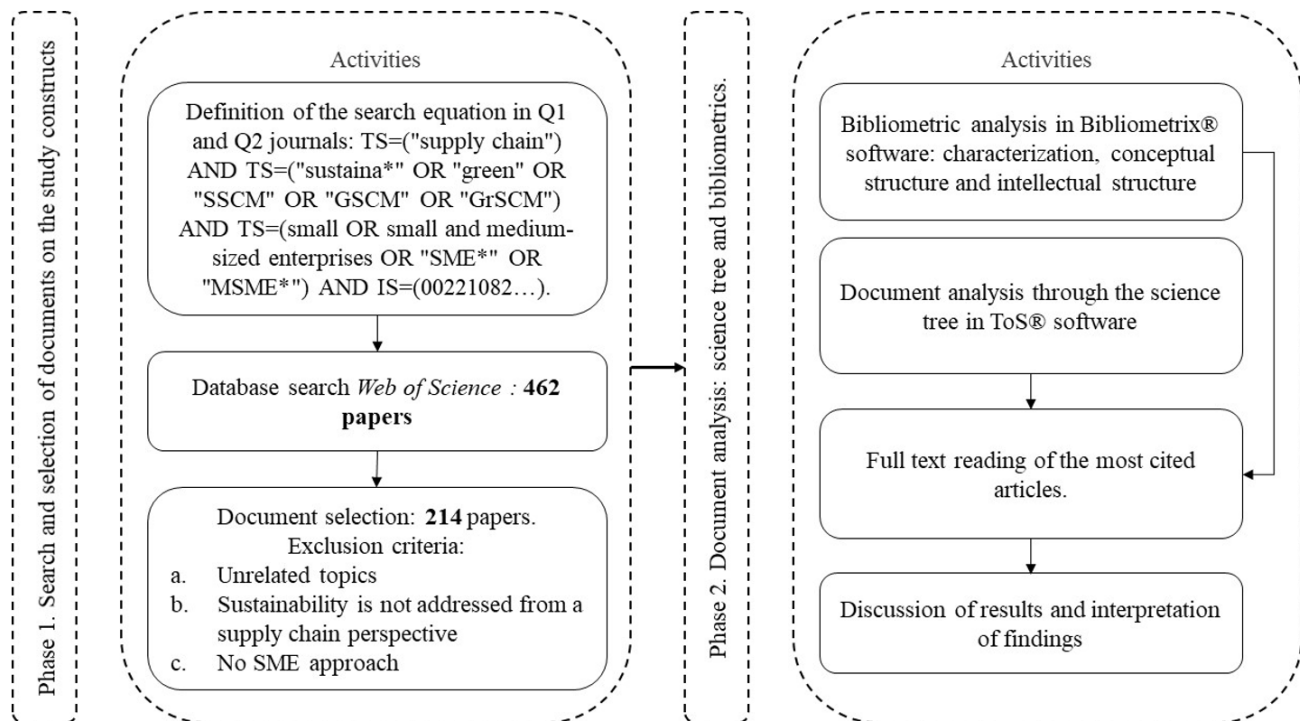


Figure 1. Methodology for literature review

Search and selection of documents

The first stage was the document search, which was conducted in the Web of Science (WoS) database, considering journals ranked Q1 and Q2 in the area of *Business, Management and Accounting* (Scimago), for a total of 823 journals as of 2023. The WoS database was selected for two reasons: the first is that, like Scopus, it provides current and relevant information in multidisciplinary fields [31]. The second is its quality standards regarding the metadata required for bibliometric analysis [32].

The search keywords were established based on the specific topic and context of the research: “sustainable supply chain management” and “small and medium-sized enterprises (SMEs).” These words, together with Boolean operators and symbols, allowed for the refined construction of the following search equation:

TS=(“supply chain”) AND TS=(“sustaina*” OR “green” OR “SSCM” OR “GSCM” OR “GrSCM”) AND TS=(small OR small and medium-sized enterprises OR “SME*” OR “MSME*”) AND IS=(00221082...).

Under this search equation, we obtained 462 articles (including early-access and review articles) published in English between 2004 and 2023. We subjected them to a detailed relevance analysis based on their titles, keywords, and abstracts. Articles were excluded by two criteria: (i) if the sustainability aspects of SMEs were not addressed from a SCM perspective and (ii) if they bore no relation the topic (SSCM) or the unit of study (SMEs).

It is also important to point out that, when the keywords assigned by the journals (keywords plus) but not by the authors contributed to some of the constructs of interest of the study, the articles were fully reviewed in order to decide on their inclusion. Thus, before the bibliometric analysis, 221 articles were fully read, out of which 19 met the inclusion criteria. This stage can be regarded as a contribution to the bibliometric methodology since it minimizes the risk of including documents that do not correspond to the area or purpose of the research. As a result of this filter, 214 documents were obtained for subsequent analysis.

Document analysis

The 214 documents were subjected to an initial analysis based on bibliometrics, which is defined as an interdisciplinary science with the purpose of studying written scientific communication through indicators, methods, and statistical and mathematical models, using information obtained from academic databases [33]. In the management area, this type of analysis has proven useful for providing retrospective insights in different fields of business research [34].

For this analysis, the Bibliometrix 4.0 software was used since it is an open-source tool for conducting complete scientific mapping analyses of the academic literature [35]. We followed the structure presented in [Tabla I \[32\]](#).

Table I. Structure of our bibliometric analysis

Domain focus	K structures
Level of analysis	Structures ^a
Metrics	Bibliometric technique
	Unit of analysis
Summary	Statistical technique
Key information	
Annual scientific production	Conceptual
	Co-Words
Sources	Author keywords
Highlighted by impact metrics (H index)	Thematic map
Authors	Intellectual
	Co-citation ^b
Countries	Citation
Outstanding by impact metrics (H index)	Articles
Scientific production by country	Authors
	Sources
Cited papers and references	Network analysis
Most cited papers	a. Bibliometrix also includes a social structure. Given the purpose of this work, is not included in the results.
Word cloud	b. For some, this is the most important analysis since it constitutes the most abundant source of data

These results were complemented using the Tree of Science (ToS). ToS is a methodology whose purpose is to reduce the search for fundamental articles in an area of knowledge, based on the analysis of citation networks, in order to identify authors and outstanding articles in a field via algorithms based on graph theory [36].

Results

For the initial analysis of the literature, a bibliometric approach was used, based on maps that represent the connections within the research field [37]. These were constructed using Bibliometrix to identify research approaches, representative authors, and the terms that most influence the knowledge domain under study [38].

General characterization of the publications

The bibliometric analysis was performed with 214 documents involving 629 authors. The observation window spanned between the years 2004 and 2023, considering that previous reviews state that SSCM research has received increasing attention in the last decade [13]. Fig. 2 shows the number of publications per year, exhibiting an average annual growth rate of 19.81%. Moreover, starting in 2017 and up to the end date of the observation window, there is growing interest in SSCM research in SMEs.

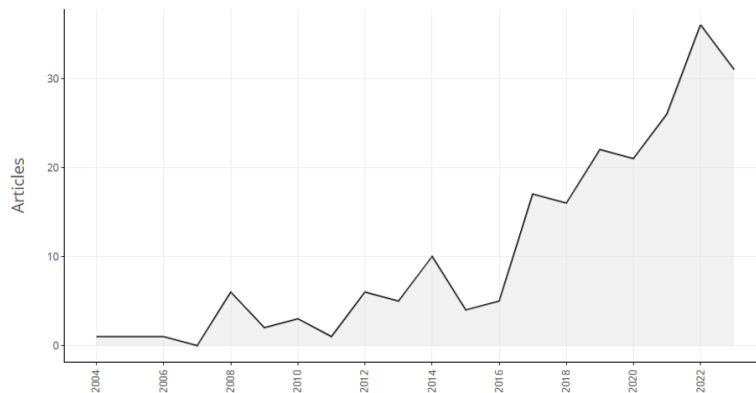


Figure 2. Annual scientific production in the area of SSCM in SMEs

Concerning the number of publications by country, India, China, United Kingdom, Italy, Indonesia, and Brazil are in the first six places, as shown in Fig. 3, where the label *SCP* (single country publication) corresponds to intra-country publications and *MCP* (multiple country publication) refer to in-ter-country research works. Colombia ranks 19th with three publications by Professor Van Hoof from Universidad de Los Andes.

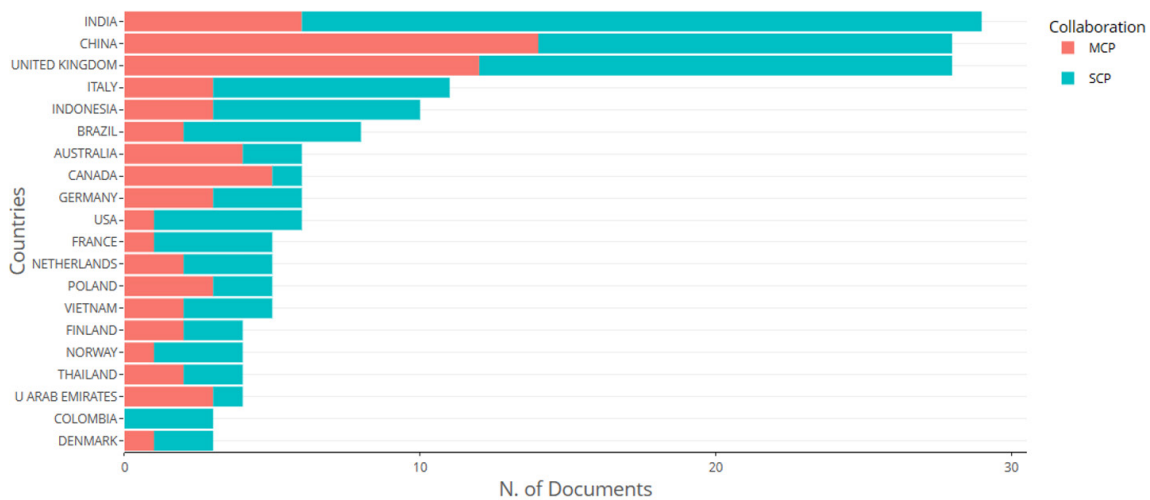


Figure 3. Scientific production by country

This result is in line with the findings of other studies, which indicates a gap in SSCM and the lack of research of non-Western and non-Asian origin [13].

Leading journals in the field

The analyzed articles were published in 64 journals ranked in quartiles 1 and 2 according to their impact factor, which can be regarded as evidence of scholarly interest in the field. [Tabla II](#) lists the 15 journals with the highest number of publications, highlighting the authors' preference for publishing in the *Journal of Cleaner Production*.

Table II. Main journals in the field

Journal	No. of documents	h_index	g_index	m_index	Quartiles
<i>Journal of Cleaner Production</i>	66	31	62	1.55	Q1
<i>Business Strategy and the Environment</i>	13	9	12	0.6	Q1
<i>Journal of Manufacturing Technology Management</i>	10	9	9	1	Q1
<i>Benchmarking: An International Journal</i>	9	4	9	0.667	Q1
<i>Corporate Social Responsibility and Environmental Management</i>	9	7	8	0.438	Q1
<i>Production Planning & Control</i>	9	8	9	0.8	Q1
<i>Supply Chain Management: An International Journal</i>	6	6	6	0.333	Q1
<i>International Journal of Logistics Management</i>	5	3	4	0.429	Q1
<i>International Journal of Emerging Markets</i>	4	1	2	0.500	Q2
<i>Journal of Industrial Engineering and Management</i>	4	3	4	0.75	Q2
<i>Operations Management Research</i>	4	2	3	0.25	Q2
<i>Clean Technologies and Environmental Policy</i>	3	3	3	0.214	Q1
<i>International Journal of Logistics-Research and Applications</i>	3	3	3	0.429	Q1
<i>International Journal of Operations & Production Management</i>	3	1	2	0.143	Q1
<i>International Journal of Production Research</i>	3	1	2	0.111	Q1

Leading articles in the field

Based on the results obtained, [Fig. 4](#) lists the 20 papers with the highest number of citations at the global level, which can therefore be considered relevant for the SSCM domain in SMEs. Within this group, [Table III](#) details the purposes, methods, and main results of nine articles, corresponding to the five most cited and the four with the most recent publication dates.

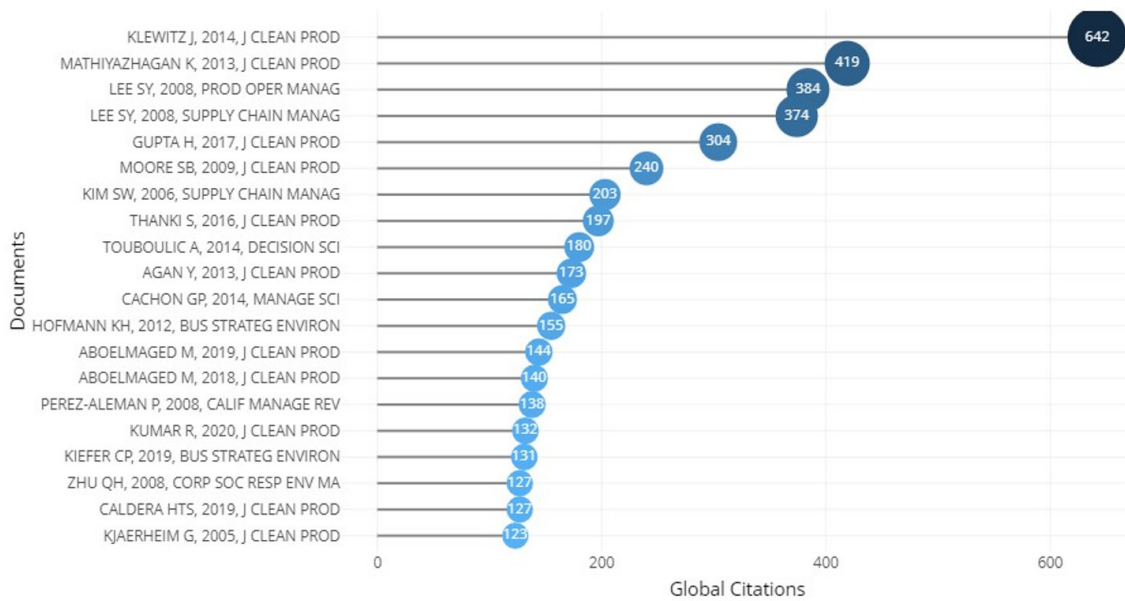


Figure 4. Featured articles in the field

Table III. Most cited articles in the SSCM domain for SMEs

Reference	Purpose	Method	Main findings
[39]	To analyze research between 1987 and 2010 on innovation practices, including different types of sustainability-oriented innovations and strategic sustainability behaviors of SMEs.	Systematic literature review.	The authors highlight three aspects: (i) the strategic sustainability behavior of SMEs ranges between resilient, reactive, anticipatory, innovation-based, and rooted in sustainability; (ii) innovation practices are identified at the product, process, and organizational levels; (iii) research continues to focus on eco-innovation rather than innovation from a triple-bottom-line perspective.
[40]	To identify the dominant barrier to GSCM adoption in the industry.	Qualitative. Interpretive Structural Model (ISM).	Different Indian automotive component manufacturing industries have distinct barriers to GSCM application. However, in its application, especially for maintaining environmental awareness, the dominant barrier is that of the supplier.
[41]	To build a map of the factors that allowed initiating and improving the environmental capabilities of SMEs over time.	Qualitative. Case studies.	This work provides a conceptual framework for understanding and defining the dynamics of environmental capability development for SME suppliers, operationalized into five factors, both internal and external: product, process, organization, supply chain, and external relationships.
[42]	To describe what facilitates small and medium-sized suppliers to engage in supply chain greening initiatives.	Quantitative. Sample 142 SMEs in South Korea.	This study finds that the willingness of SMEs to participate in GSCM initiatives is largely dependent on two factors: the environmental requirements and support of buyers and the willingness of the supplier. Governments can play an important role in motivating these suppliers. Finally, the paper reveals that the fewer resources and organizational capabilities suppliers have, the more willing they are to participate in such initiatives.

Reference	Purpose	Method	Main findings
[43]	To present a framework for selecting suppliers among SMEs based on their capacity for eco-innovation.	Qualitative. BWM and Fuzzy TOPSIS.	This study presents a framework to help managers select green and innovative suppliers among various SMEs.
[44]	To examine the effect of absorptive capacity on the adoption of green innovations.	Quantitative. Sample: 193 SMEs in an emerging economy.	Absorptive capacity is a strong predictor of sustainable capabilities and green innovation adoption. In addition, sustainable orientation and collaborative capabilities are evidenced as significant determinants of green innovation adoption and mediators of the effect of absorptive capacity on green innovation adoption. Sustainable human capital does not show a significant impact on green innovation adoption.
[45]	To analyze the role of dynamic resources, competencies, and capabilities (RCC) as determinants (drivers and barriers) of different types of eco-innovation (EI).	Quantitative. Sample: 197 Spanish industrial SMEs developing EI.	The results suggest that physical CCRs, participation in green supply chains, and an adequate corporate culture, promote IE; technological drive, market pressure, and internal financial resources represent drivers of these IEs, while cooperation, organizational learning, an ISO green certification, and technological path dependence, constitute barriers.
[46]	To explore the co-evolution of <i>lean</i> and <i>green thinking</i> and the potential of these practices to enable successful transitions to sustainable business practices.	Qualitative.	Through the adoption of lean and green thinking in the transition to sustainable business practices, SMEs can contribute more quickly to the circular economy at the enterprise level.
[47]	To investigate the challenges of applying Industry 4.0 technologies in SMEs for ethical and sustainable operations.	Qualitative. DEMATEL.	The challenges have been categorized as cause and effect. In the causes, the main challenge is the lack of motivation of partners and customers in the application of I4.0 technologies. In the group of effects, the fear of failure of I4.0 technologies stands out.

When reviewing these papers, a very concrete focus on the environmental perspective of sustainability is evident, which is in line with previous findings, wherein the need to delve deeper into the social dimension of SSCM is established as a research gap [13], [48]. Furthermore, in the context of SMEs, the idea that entrepreneurial orientation through the components of innovation, proactivity, and risk-taking can lead to a greater commitment to sustainability has received empirical support in several works [15]. This is reflected in the perspective of the most cited articles, in which eco-innovation or ecological or green innovation are highlighted within the thematic axes.

Structures of the publications

Conceptual structure

The analysis of thematic networks was based on the keywords defined by the authors of the papers. As a result, the network shown in Fig. 5 whose similarity was calculated while considering the co-occurrence of the keywords identified in the set of publications. The authors' keywords were

considered since they express the orientation and descriptors through which they present their work to the scientific community. The node size reflects the frequency (weight) of occurrence of the words. Sustainability, SMEs, SCM, and circular economy are highlighted as those with the highest level of importance, which is reinforced in Fig. 6.

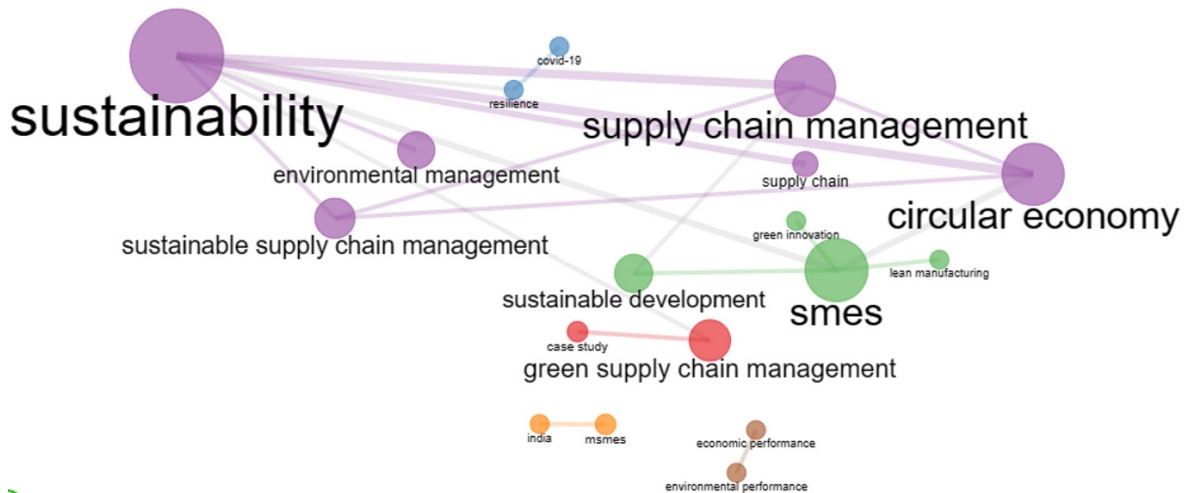


Figure 5. Keywords of the authors



Figure 6. Cloud of main author keywords

As expected, the terms that stand out for their frequency are those that integrate the search equation, so the analysis focuses on other words relevant to the authors of the analyzed documents. Based on this, it is possible to establish the conceptual link between SSCM and the domains of circular economy and corporate responsibility, which can be also considered for analyzing the case of developing countries. Other terms relate to innovation, barriers, and the inclusion of microenterprises as objects of study.

Intellectual structure

Co-citation represents the frequency with which two units of analysis are cited by other documents, under the assumption that the more two items are cited together, the more likely it is that their content is related [49]. In the case of co-cited authors, four clusters of authors were observed (Fig. 7). The red cluster includes authors who have specifically addressed SSCM, highlighting Seuring and Carter as widely cited. In the green cluster are the authors who have developed the topic of SSCM more strongly, *e.g.*, the works of Zhu and Sarkis, recognized as pioneers in the topic of practices; or that of Srivastava, who is credited with the most cited definition in this field. The blue cluster points to the methodological approach of structural equations and a theoretical approach to the natural resource-based view of the firm, proposed by Hart in 1995. Finally, the purple cluster includes authors who have addressed issues in this domain of knowledge under the theoretical lens of Barney in 1991, *i.e.*, based on the theory of resources and capabilities.

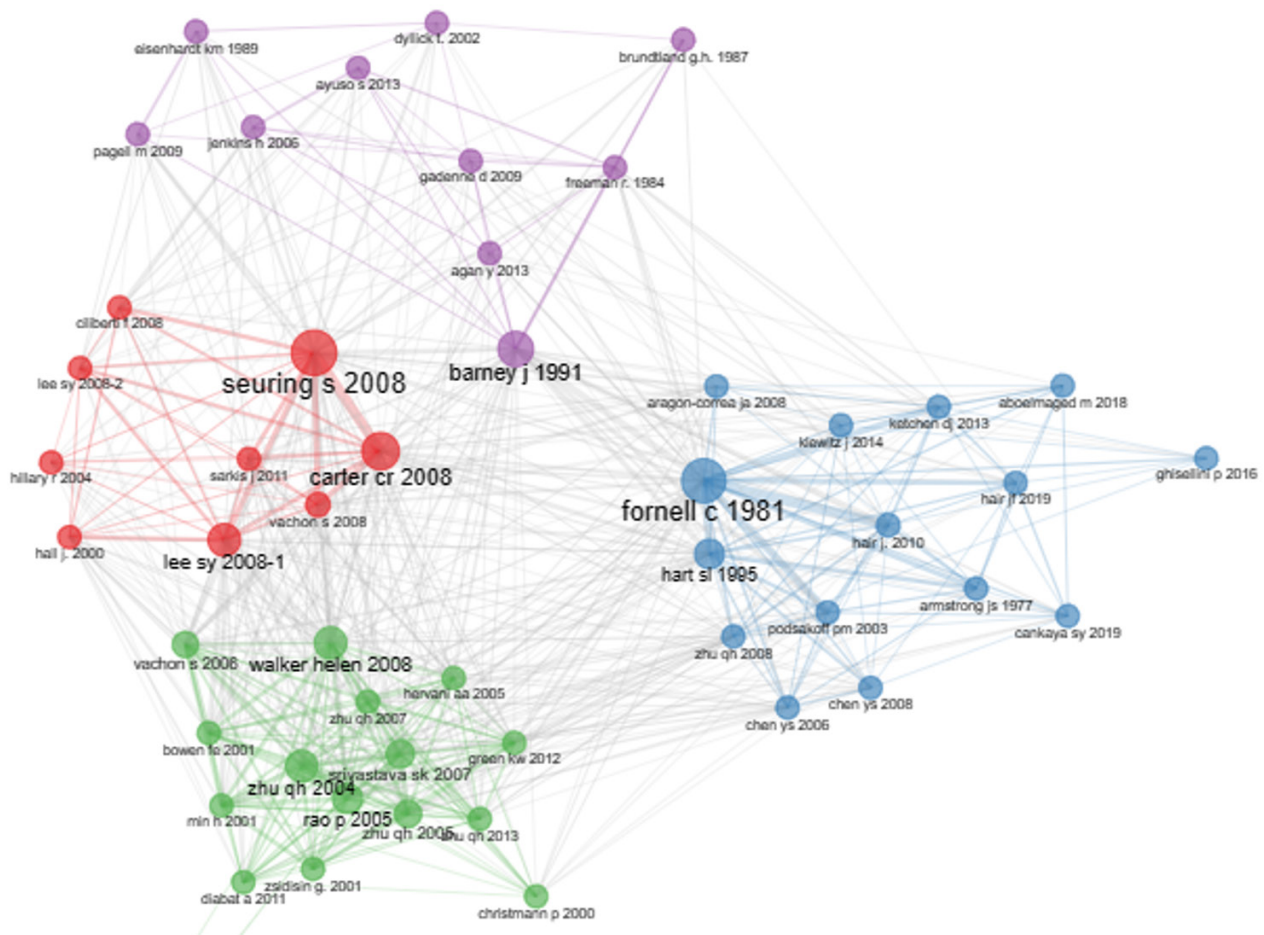


Figure 7. representative authors in the field

Tree of Science

The ToS methodology produced 90 documents, with 20 articles in the root, 20 in the trunk, and 50 in the leaves or branches (details can be found in [Appendix 1](#)). The articles found at the root correspond to research that supports the theory of the area of knowledge under review [50]. For this case, 20 articles in three streams were identified. The first is specific to the subject area, with outstanding authors such as Seuring, Zhu, Carter, Vachon, Srivastava, and Sarkis. The second focuses on methodological aspects and makes extensive use of the structural equations method, *e.g.*, the papers by Fornell and Hair. Finally, the third deals with the theories that have supported the area, with the works of Barney and Hart.

20 articles are contained in the trunk, which, according to the ToS, are those that begin to shape the theory, are more specific on the subject, and have become benchmarks over time [36]. The keywords associated with the trunk are impact, performance, drivers, environmental management, and management, which are in turn associated with drivers, practices, and performance results. These are the main constructs that make up the conceptual frameworks of GSCM/SSCM [9], [30], [51]–[53].

The different perspectives under which the subject has been developed are located in the branches [36]. They amount to 51 works, under the following keywords: performance, impact, framework, management, and innovation. In general, with the ToS tool, it is possible to establish the seminal works (root) and the thematic perspectives in this area of research based on the articles in the trunk and branches.

Conclusion

From the questions that guided this literature review, the first finding that should be highlighted in the area of SSCM for SMEs is the increase in the number of publications, mainly since 2016, in response to a call from the academic community to pay more attention to this type of companies, given their role in improving environmental management and performance in the broader competitive framework of the supply chain [41]. The increasing attention of this knowledge domain has been established in different literature reviews, concluding that it is likely to increase in the coming years because of an increased awareness of environmental sustainability around the world [11], [27], [54].

In the area of SSCM/GSCM in general, studies such as that by [54] conclude that they are relatively new disciplines; more than 70 percent of the contributions come from only 15% of the first authors. In addition, significant contributions have come mainly from researchers from China, followed by USA, UK, Taiwan and India. The cited authors consider that this field is still in its early stages and requires significant attention to take the current research to the next level. This behavior differs slightly when the unit of analysis is SMEs, highlighting India, China, and the UK as the countries with the highest number

of contributions. However, this study also ratifies the need for research of non-Asian origin [13] and in the context of developing countries [55].

With respect to the journals with the highest number of publications, it is important to highlight two aspects: the first is the interest in publishing the findings of SSCM in SMEs in journals classified in quartiles 1 and 2, which can be considered a sign of their academic importance; the second is the authors' preference for publishing in the *Journal of Cleaner Production*, given its wide recognition in the academic world, which makes it a key reference for researchers.

On key topics and authors, the results regarding the intellectual structure of the bibliometric analysis and the seminal papers of the science tree are in line with other literature reviews, which evidence the dominant influence of the work done by Zhu and Sarkis on GSCM practices and performance [9]. The topics of the most cited articles include eco-innovation, defined as innovations that reduce the environmental impact of consumption and production activities [45], and, in all cases, the environmental dimension of sustainability prevails. Thus, the findings of this review support the call for academics to approach this area from a triple-bottom-line perspective.

As for co-cited authors, the works are divided into four groups. The first group includes authors who have specifically addressed SSCM, with Seuring and Carter standing out as widely cited authors. The second group includes authors who emphasize the environmental dimension of SCM, with Zhu and Sarkis being recognized as pioneers in the subject of practices, and Srivastava as having provided the most cited definition in this field. The third group has a methodological emphasis on structural equations and a theoretical approach to the natural resource-based view of the firm proposed by Hart in 1995. Finally, the last group includes authors who have addressed issues in this domain of knowledge under the lens of resource and capability theory.

In general, the results show the academic importance of SSCM in SMEs, its authors, and its representative topics, and they corroborate the need to strengthen research in this area, mainly in developing countries of non-Asian origin, to build a body of knowledge on which to design policies appropriate to the characteristics and needs of SMEs.

This article contributes to the literature on SSCM by expanding the body of knowledge in this area within the context of SMEs, marking an initial step towards promoting research for this type of company, which, due to its distinctive characteristics, necessitates specific analysis and solutions. Although several literature reviews have been conducted in the field of SSCM, few focus on SMEs, despite their importance to the economy and sustainability.

As a continuation of this literature review, different research possibilities are suggested. One of them is to document the results achieved by SMEs in each of the constructs that make up the conceptual framework of SSCM, namely drivers, practices, and performance results, in order to establish a holistic view under the triple-bottom-line approach. Another avenue for future research is to delve deeper into the findings of empirical studies conducted on SMEs and explicitly document the theories that have guided them. While it is true that previous reviews have highlighted the use of resource-based view theory [11], [56], another school of thought maintains that SMEs do not possess rare, valuable, and difficult-to-imitate resources that allow them to achieve competitive advantages. Therefore, a practice-based view [57] has emerged as an alternative, which, in the case of SCM, has been dubbed the *supply chain practice view* (SCPV) [58]. With it, it is possible to identify how these types of companies manage to improve their performance within a framework of sustainability.

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Appendix. Tree of science for the SSCM knowledge domain in SMEs.

Root

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