

Organizational capabilities and SSCM: a bibliographic review and cluster analysis

Organizational capabilities and SSCM

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Abstract

Purpose – The purpose of the study is to perform a scientific mapping and detect the evolution pattern of two emerging fields, organizational capabilities and sustainable supply chain management (SSCM), to detect and visualize the existing conceptual domains and identify less-explored areas.

Design/methodology/approach – This study uses a methodological combination involving systematic literature review and bibliometric analysis. The methodology was implemented in the following order: definition and selection of the material using an electronic database, descriptive analysis of the material, category selection using bibliographic coupling analysis by VOSviewer (clusterization), material evaluation and content analysis.

Findings – The research results clarify the intellectual structure within the academic field. The authors' identified three main clusters: (1) sustainable capabilities and practices in supply chain management (SCM), (2) green SCM and performance and (3) information technology and innovation. The findings reveal that there is a rich field to be explored, especially regarding issues involving sustainable technological capabilities, sustainable initiatives and key resource development.

Practical implications – This study facilitates researchers' and practitioners' understanding and their ability to map the different paths and evolution of SSCM and organizational capabilities. It can encourage managers and policymakers alike to conceive new approaches to engage in the adoption of SSCM.

Originality/value – This work employs a singular approach to identify the intellectual knowledge and topics related to the implementation of SSCM by adopting the theoretical approach of sustainable organizational capacity. It contributes to the debate on distinguishing specific sustainable organizational capabilities from traditional capabilities.

Keywords Sustainable supply chain management, Capability, Systematic literature review, Bibliographic coupling, Sustainability

Paper type Literature review

1. Introduction

Sustainability is a key topic in the agendas of organizations, society and academia. In today's competitive and dynamic scenario, of which organizations form a part, this topic has gained significance, mainly because of pressure from stakeholders, consumers and government regulations (Ansari and Kant, 2017a; Gold *et al.*, 2010; Seuring and Müller, 2008a). Consequently, this has created pressure on the supply chain (SC) regarding issues related to demand, risk, waste, climate change, transparency, etc. (Carter and Easton, 2011; Govindan, 2018). Nevertheless, a company as well as its SC can only effectively implement

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sustainable management practices when they can develop the necessary resources (Bowen *et al.*, 2001; Gold *et al.*, 2010).

What was once competition between companies and organizations is now also occurring between whole SCs (Cabral *et al.*, 2012; Gold *et al.*, 2010). Seuring and Müller (2008a, b) argue that the concept of sustainability has become increasingly significant within SCs. Additionally, Wilburn Green *et al.* (2015) propose that companies with market orientations are more likely to develop and implement environmental sustainability strategies and create competitive advantages. There is a trend of preponderance of special issues dedicated to this topic in top academic journals specializing in operations and supply chain management (SCM) (Ansari and Kant, 2017b; Dey *et al.*, 2011; Sarkis *et al.*, 2011).

Academic research on sustainable supply chain management (SSCM) has attracted increasing attention over the last few years. This is evident from the number of studies and the literature review published in this area by academics. For example, Seuring and Müller (2008a, b) categorize the literature of SSCM; Carter and Rogers (2008) provide a review of the sustainability and logistics literature; Ahi and Searcy (2013) identify concepts for green supply chain management (GSCM) and SSCM; and Dubey *et al.* (2017) propose a conceptual framework for GSCM and SSCM. More recently, studies have been published addressing the integration of more specific aspects, such as the work of Akbari and McClelland (2020), which includes a systematic review of the domains of corporate social responsibility and corporate citizenship in SSCM, and the work of Choudhary and Sangwan (2022), which includes a critical literature review of GSCM pressures, practices and performance.

Another significant topic of research is the role of internal and external resources and capabilities within SSCM (Beske, 2012; Beske *et al.*, 2014; Govindan, 2018). Additionally, a few studies indicate that the lack or insufficiency of resources creates difficulties or barriers to the implementation of specific programs, for example, total quality management (Talapatra and Uddin, 2019). The appropriate resources, skills and capabilities facilitate the corporate behavior of the environmental and ethically correct SC (Gold *et al.*, 2010). According to this concept, an organization's competitiveness is derived from specific organizational capabilities, such as less tangible, knowledge-based advantages, organizational processes and reputational assets resources (van Hoof and Thiell, 2015). Capabilities are defined as the capacities of a bundle of resources being united to perform value-added tasks or activities (Hart, 1995).

Recently, a study proposed that green capabilities drive the adoption of GSCM (Nkrumah *et al.*, 2021). Additionally, research related to capabilities is also founded in the literature, for example, the ability to collaborate with suppliers (Busse *et al.*, 2016), organizations' capability to share information with SC partners (Meacham *et al.*, 2013), sustainable traceability (Garcia-Torres *et al.*, 2019), the capacity of social management to address stakeholders' demands (Huq *et al.*, 2016; Klassen and Vereecke, 2012), organizational learning (Oelze *et al.*, 2016) and the ability to implement specific sustainable practices (Zeng *et al.*, 2017).

However, merely focusing on economic aspects and market efficiency is insufficient for organizations to achieve long-term competitive advantages. Sustainability cannot be achieved by the company alone; it has to occur across the SC (Dao *et al.*, 2011), and the understanding of internal and external capabilities cannot be dissociated from the development of SSCs. According to Gold *et al.* (2010), there must be an association between what is expected in theory and practical implementation to ensure sustainable practices, as well as the ability to identify what is possible in terms of implementation by individuals and within the SC, based on each organization's internal capabilities (Bowen *et al.*, 2001; Gold *et al.*, 2010).

Market changes are increasingly fast and dynamic, and companies interact in an interconnected environment. Companies are responsible for encouraging their SCs to develop and adapt resources and capabilities that satisfy the new demands and pressures. Capabilities are created by the combination of resources, including human resources and

technical and managerial skills (Dubey *et al.*, 2019). This challenge is even greater when it comes to sustainable systems.

Significant research has been conducted in the SSCM field (Nimsai *et al.*, 2020); however, a better understanding of corporate sustainability and capabilities is required (Amui *et al.*, 2017; Bari *et al.*, 2022; Buzzao and Rizzi, 2021). There is a lack of debate regarding whether it is possible, or not, to distinguish sustainability-specific organizational capability from traditional capabilities (Buzzao and Rizzi, 2021). Furthermore, it is required to understand how sustainable strategy can be integrated with organizational capabilities.

This research attempts to understand how these two academic fields, when integrated, lead to sustained competitive advantage. Previous studies focused exclusively on either capabilities or sustainability, with very few studies employing an integrative approach (Bari *et al.*, 2022). Thus, instead of merely concentrating on SSCM adoption or green practices, we investigate those organizational capabilities that act as essential drivers for the long-term adoption of an SSC. This concept is based on certain significant capability and resource theories in the SCM field, such as dynamic capability (DC) (Teece *et al.*, 1997) and the resource-based view (RBV) (Hart, 1995). Accordingly, we analyze organizations' capabilities from the internal perspective, as well as the SSCM field, and specifically identify which capabilities are essential to adopt SSCM strategies.

The objectives of this study are to ensure a better understanding of the academic position and mapping of the intellectual structure of the two academic domains, as well as analyze currently less-explored areas and new paths/avenues of the literature related to organizational capabilities and SSCM, to answer the following research question:

- RQ1. What has been the volume and research type of the literature?
- RQ2. Which journals and authors have had the greatest impact in the literature?
- RQ3. Which academic lines of research study capability and SSCM, including their position and evolution?

Adopting a systematic literature review and the bibliometric technique of bibliographic coupling analysis (clusterization), this study provides useful categorizations designed to generate certain practical guidelines and propose new paths for academic studies in the SSCM field. Our objective is, therefore, to assist researchers and professionals by clarifying the pattern and evolution of intellectual activity in the field of SSCM and organizational capacity. The rest of this article is structured as follows: Section 2 presents the research methodology and the protocol criteria for selecting articles in the literature. Section 3 presents the findings and results, and the descriptive literature analysis and the bibliometric descriptive and clusters content analysis are revealed. The discussion and conclusion are presented in Section 4, together with the main results and the theoretical and practical implications and limitations of the study.

2. Research methodology

Systematic literature reviews performed through data extraction procedures enable a comprehensive analysis of all previous studies in the field of management with the necessary methodological rigor, in addition to reducing human error and bias in the data collection process (Tranfield *et al.*, 2003). To this end, the approach chosen for the systematic literature review was similar to that used by Seuring and Müller (2008a, b), Beske *et al.* (2014), Gold *et al.* (2010), Ansari and Kant (2017a, b) and (Prashar and Sunder, 2020).

The methodological flow is organized in four distinct steps and is represented in Figure 1, namely, (Step 1) material collection: where the material to be collected is defined and

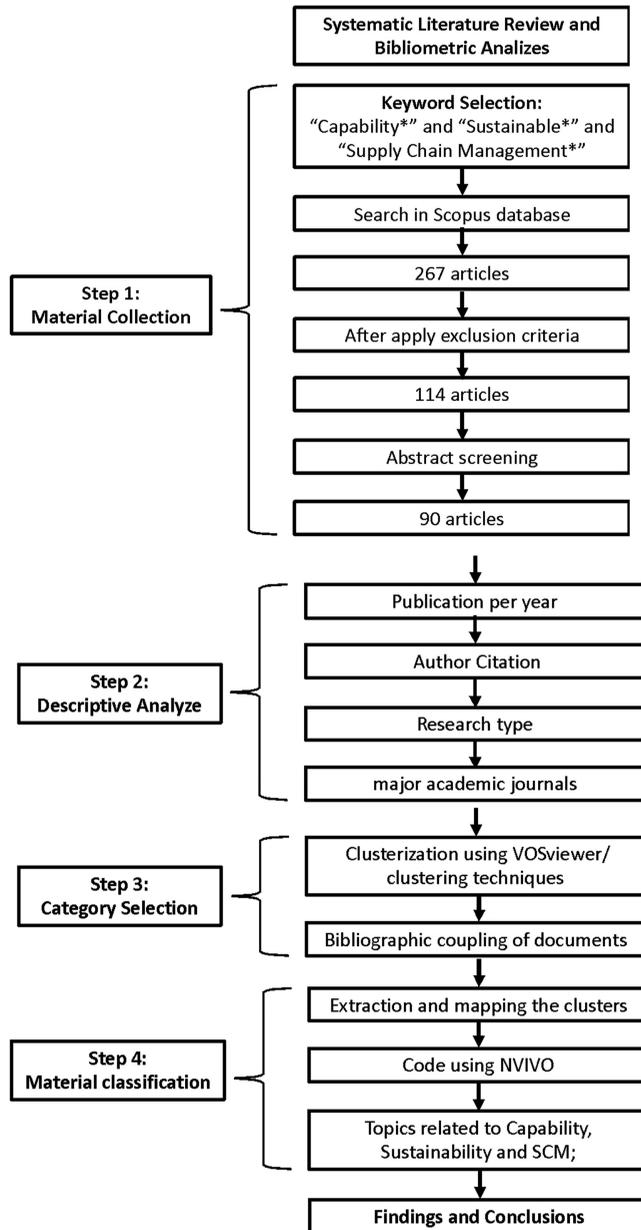


Figure 1. Systematic literature review methodology

Source(s): Authors own work

delimited, the scientific article itself is the unit of analysis; (Step 2) descriptive analysis: this evaluates the formal aspects of the material collected, such as the number of publications per year, the main journals, the main authors in the respective field, and which methodologies are

applied, leading to constructing the background for the subsequent theoretical analysis; (Step 3) category selection: whereby the structural dimensions form the main topics of analysis, which, in this specific case, are bibliometric analysis and the *clusterization* of the field, and finally; (Step 4) material evaluation: where the material is analyzed according to the structural dimensions, facilitating the identification of relevant issues and positioning within the academic field.

Following the methodology of analysis described above, an assertive, transparent and consistent literature review is presented below. Steps 1, 2, 3 and 4 are discussed in [Sections 3.1, 3.2, 3.3 and 3.4](#), respectively, and the characterization of the clustered material is discussed in [Section 4](#).

2.1 Systematic literature review and bibliometric analysis

2.1.1 Material collection. The scope of the study was delimited and defined in this phase ([Table 1](#)). The collection of material involves peer-reviewed past works in the SSCM field published in English; in the fields of Business, Management and Accounting; and documents such as “papers” and “reviews” published in journals. A structured research procedure was employed in the SCOPUS bibliographic database, using the following keywords: “Sustainable*” and “Supply Chain Management” and “Capability*,” within the Title, Abstract and Keywords. The SCOPUS database was considered for the study because of the comprehensive coverage of its bibliographic base in several fields, including management, social sciences, technology, medicine, arts and humanities ([Ansari and Kant, 2017b](#); [Fahimnia et al., 2015](#)). Furthermore, the SCOPUS database indexes more than 82 million documents, 7,000 publishers, 17 million author profiles and 1.7 billion cited references, all of which are rigorously evaluated and selected by an independent review board. The research yielded 114 articles. After applying the inclusion criteria, the remaining articles were analyzed according to their abstracts, with those which had no direct connection with sustainable supply chains (SSCs) or capabilities being excluded, resulting in a final number of 90 articles.

2.2 Bibliometric analysis

VOSviewer® (v 1.6 15) was used for the mapping and categorization of the selected material, as this software enables the transformation of bibliometric data into graphical representations in terms of co-occurrence and similarity ([van Eck and Waltman, 2010](#)). Additionally, the production of bibliometric maps facilitates the identification of clusters and relationships within the academic field ([van Eck and Waltman, 2010](#)). The original database from SCOPUS with the bibliographic information of the articles in the CSV format was introduced into the VOSviewer software, without any modification. The software requires the introduction of a minimum limit for the number of documents published per author, and this

Protocol (inclusion criteria)	Description
Database	SCOPUS
Subject area	Business, Management and Accounting
Document type	“papers” and “reviews”
Source type	Published in peer-reviewed journals
Language	English only
Procedure used	Structured research by keywords in the “Title, Abstract and Keywords”
Keywords used	“Sustainable*”, “Supply Chain Management*” and “Capability*”
Source(s): Authors own work	

Table 1.
Material collection protocol

limit was set at 20, similar to the procedure used in previous works (Freire and Veríssimo, 2021; Nimsai *et al.*, 2020). Those bibliographies that satisfied the selected limit were then mapped and grouped into clusters, enabling the analysis of the networks by the bibliographic coupling of documents, as illustrated in Figure 6.

3. Findings and results

3.1 Descriptive analysis of the literature

The objective of the descriptive analysis is to access the formal information and clarify the dimensions of the classified articles. A descriptive analysis was performed of the 90 final articles in the SCOPUS bibliographic database, before and after applying the protocol criteria. Following an approach similar to that of Seuring and Gold (2012), the descriptive analysis covers the following points:

3.1.1 Distribution across the time. According to Figure 2, an increasing trend is identified regarding the number of articles published per year. The first work dates back to 2005, which can be considered as relatively recent for the SSCM field. The drop in 2021 refers to the research period, which occurred at the beginning of that year.

3.1.2 Publication distribution across the journals. The selected articles are distributed over 45 journals. Within this group, four journals constitute more than 70% of the publications, namely: *Journal of Cleaner Production*, *International Journal of Supply Chain Management*, *Supply Chain Management* and *International Journal of Production Economics*. Figure 3 shows the 12 journals with the most publications, verifying the multidisciplinary aspect and dynamism of the topic, considering the significant distribution and dispersion of the studies in different journals.

3.1.3 The main authors within the research field. A total of 160 authors contributed to the 90 articles; Figure 4 lists the 10 main authors. Seuring S., with six articles, is the most representative author within the research, followed by Beske, P., Dubey, R., Papadopoulos, T. and Roubaud, D., all with three works each related to the topic of our literature review. The presence of Seuring S. and Beske P. in the list of the main authors is similar to the result in other studies in the SSCM field (Ansari and Kant, 2017a, b). The vast majority of authors contributed with one article within the field, which indicates the interdisciplinary aspect of the topic.

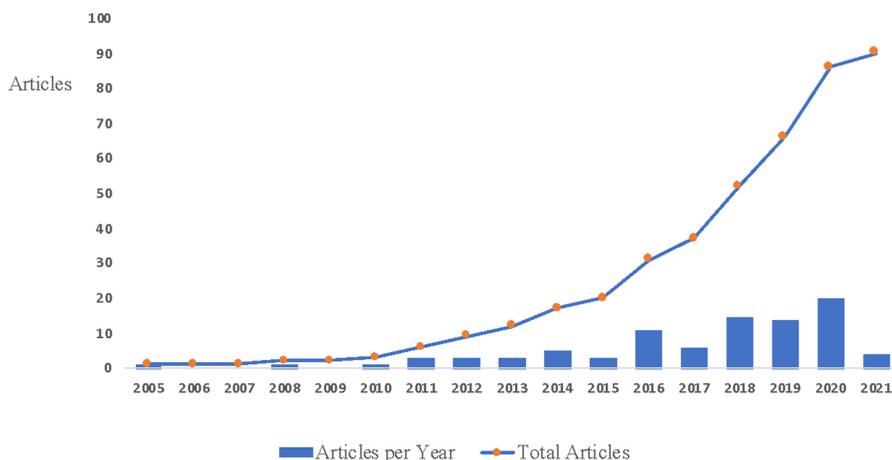


Figure 2. Distribution of publication per year

Source(s): Authors own work, based on the SCOPUS database



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Figure 3. Publication distribution across the journals

Source(s): Authors own work, based on the SCOPUS database

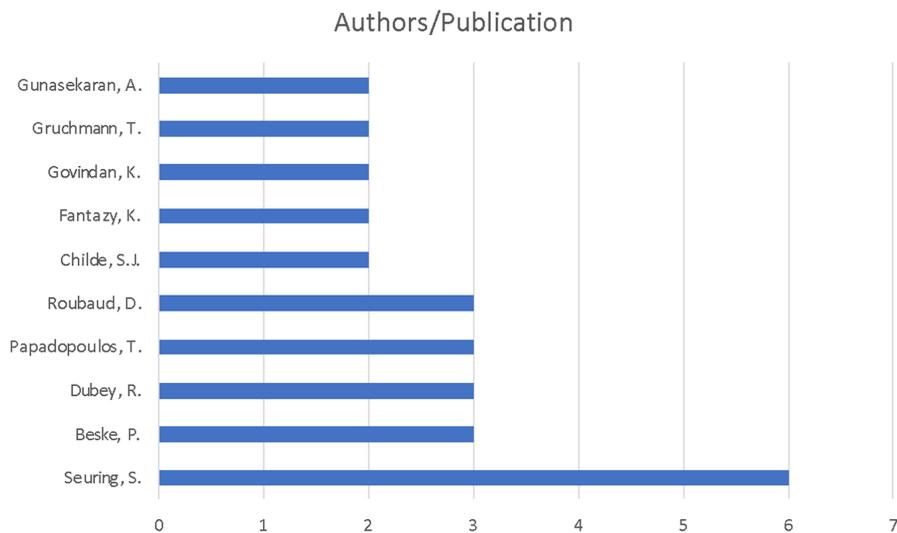


Figure 4. The main authors within the research field

Source(s): Authors own work, based on the SCOPUS database

3.1.4 *The research methodologies applied.* The literature was also classified according to the methodology applied in each study. The same classification as by Seuring and Müller (2008a, b) was used: (1) theoretical and conceptual studies, (2) case studies, (3) surveys, (4) modeling papers and (5) literature reviews. This classification is presented in Figure 5. We identified a larger number of surveys and case studies, which may indicate that researchers are making a concerted effort to develop this relatively new field and validate the existing discoveries.

3.2 *Bibliometric analysis and clusters content analysis*

3.2.1 *Bibliometric analysis.* VOSviewer® (v 1.6 15) was used for the analysis of the material to map the research field, as this procedure mitigates the bias of the subjectivity of the literature review and provides complementary information for the structured reviews (Zupic and Čater, 2015). Many researchers use bibliometric analysis in their systematic literature reviews (Prashar and Sunder, 2020). This versatile method facilitates application in various fields of science, including strategic management (di Stefano et al., 2010).

We used bibliometric analysis in this study, using bibliographic coupling and taking into account that this strategy best fits recent/emerging research fields, whereas co-citation fits better with older studies (Freire and Veríssimo, 2021; Small, 1999; Zupic and Čater, 2015). The bibliographic coupling uses the similarity between two articles and the number of shared references, where the greater the overlap of bibliographies between two articles, the greater the connection between them (Zupic and Čater, 2015). The software requires a limit that represents the minimum number of documents per author, which was set at 20, similar to the procedures used by Freire and Veríssimo (2021) and Nimsai et al. (2020).

3.2.1.1 *Cluster visualization and authors' contribution among the clusters.* The mapping of clusters generated by bibliometric analysis was performed using the 90 final articles of the research using the SCOPUS database. After the application of the VOSviewer software, the visual map was represented by 39 articles, divided into three clusters, with each color in

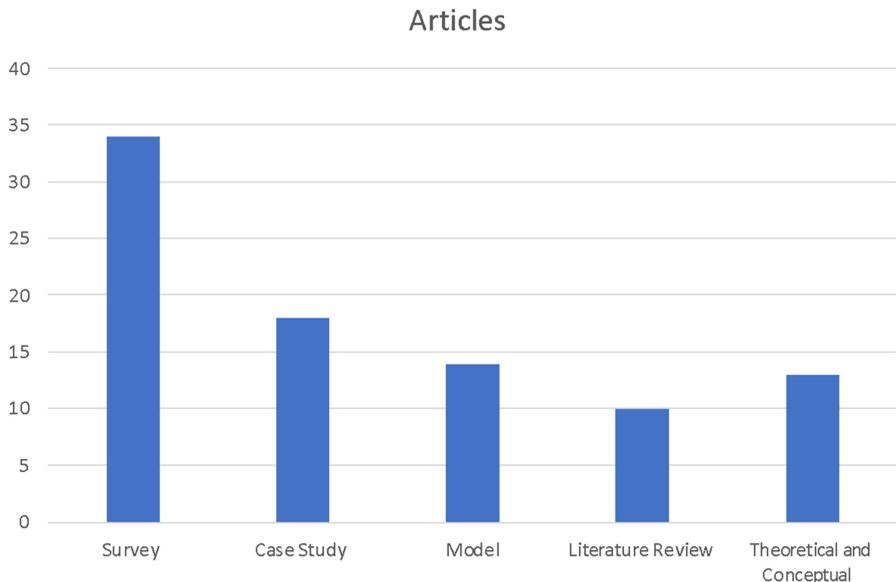


Figure 5. Research methodologies applied in the studies

Source(s): Authors own work, based on the SCOPUS database

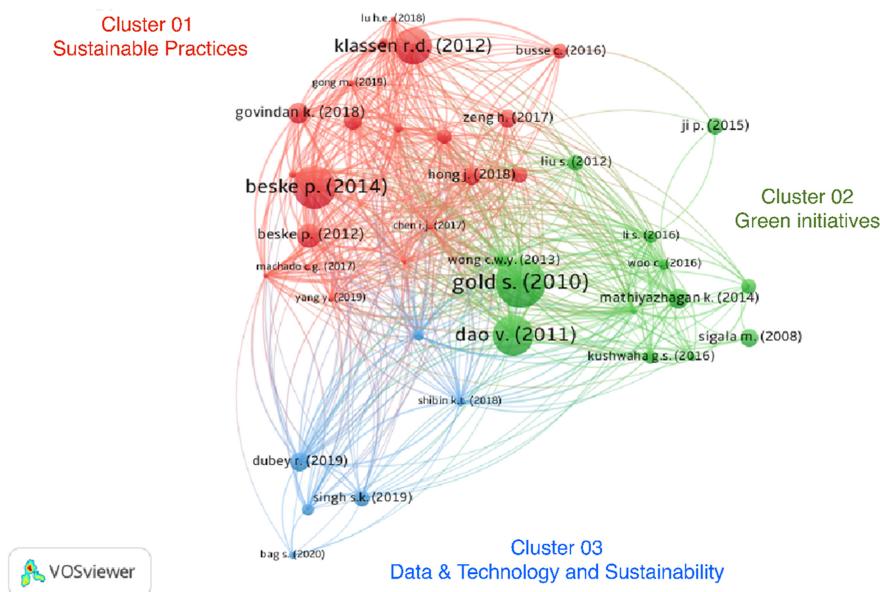


Figure 6. Bibliographic coupling of documents with the VOSviewer software (lines limited to 500 to enhance visualization)

Source(s): Authors own work, using the VOSviewer software mapping analysis

Figure 6 representing a different cluster, indicating a group of related items (red, green and blue). The NVivo 1.5 software was used to support the codification and categorization of the clusters. The results are discussed below, and used to generate a practical mapping of the SSCM field, which can be used to support future studies within the field.

The node size reflects the number of documents, whereas the proximity of the nodes indicates the degree of intellectual affinity, that is, authors located mutually close are frequently co-cited, whereas those who are more distant are less so (Nimsai *et al.*, 2020). Furthermore, this section provides an overview of the highest contributing authors among the three clusters. Table 2 listed the top 10 contributing authors in the research area of SSCM and organizational capabilities. Gold S. is the top contributing author, with 493 citations in this field, followed by Beske P (388 documents) and Dao V (363 documents). The articles by the respective authors are: “Sustainable supply chain management and inter-organizational resources: a literature review” (Gold *et al.*, 2010); “Sustainable supply chain management practices and dynamic capabilities in the food industry: a critical analysis of the literature” (Beske *et al.*, 2014); and “From green to sustainability: Information Technology and an integrated sustainability framework” (Dao *et al.*, 2011).

Additionally, Table 3 lists 10 articles produced by the bibliographic coupling linkage strength, which provides a perspective on the most connected and fundamental research approaches that support the intellectual structure of organizational capability and SSCM. Studies on relational capabilities and stakeholder pressure (Chen and Kitsis, 2017), dynamic capabilities (Beske *et al.*, 2014), and inter-organizational capabilities (Gold *et al.*, 2010) are particularly relevant for the research area.

The temporal map shows the topics that have generated recent interest in SSCM and organizational capabilities (Figure 7). After 2018, the most frequent topics have been concentrated in the blue cluster, followed by the red nodes, with these clusters including a

Authors	Total citations	Total link strength
Gold S	493	203
Beske P	388	203
Dao V	363	115
Klassen RD	314	87
Govindan K	140	126
Mathiyazhagan K	130	119
Dubey R	129	123
Hong J	119	162
Huq FA	119	152
Sigala M	119	19

Table 2.
Top 10 authors' contributions among the clusters

Source(s): Authors own work, based on the SCOPUS database and VOSviewer software

Authors	Title	Year	Total citations	Total link strength
Chen IJ, Kitsis AM	A research framework of sustainable supply chain management: The role of relational capabilities in driving performance	2017	28	290
Beske P, Land A, Seuring S	Sustainable supply chain management practices and dynamic capabilities in the food industry: A critical analysis of the literature	2014	388	203
Gold S, Seuring S, Beske P	Sustainable supply chain management and inter-organizational resources: A literature review	2010	493	203
Gruchmann T, Seuring S	Explaining logistics social responsibility from a dynamic capabilities perspective	2018	20	185
Hong J, Zhang Y, Ding M	Sustainable supply chain management practices, supply chain dynamic capabilities, and enterprise performance	2018	119	162
Famiyeh S, Kwarteng A, Asante-Darko D, Dadzie SA	Green supply chain management initiatives and operational competitive performance	2018	24	160
Peters NJ, Hofstetter JS, Hoffmann VH	Institutional entrepreneurship capabilities for interorganizational sustainable supply chain strategies	2011	54	159
Roehrich JK, Grosvold J, Hoejmose SU	Reputational risks and sustainable supply chain management: Decision making under bounded rationality	2014	87	153
Huq FA, Chowdhury IN, Klassen RD	Social management capabilities of multinational buying firms and their emerging market suppliers: An exploratory study of the clothing industry	2016	119	152
Beske P	Dynamic capabilities and sustainable supply chain management	2012	177	149

Table 3.
Top 10 link strength studies

Source(s): Authors own work, based on the SCOPUS database and VOSviewer software

technological approach (e.g. IT, big data, etc.) and sustainable practices. We conduct a more in-depth content analysis of each cluster in [Section 3.2.3](#). These results also show how recent the field is, and which trends are explored in the intellectual field.

3.2.2 Descriptive literature analysis among the clusters. The main findings within the clusters generated by the bibliometric analysis of the VOSviewer software are presented in

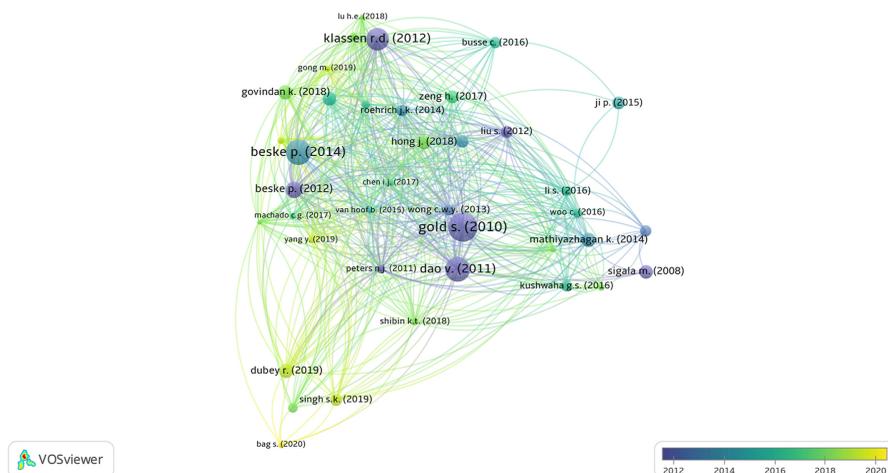


Figure 7. Temporal overlay bibliographic coupling of documents, using the VOSviewer software (lines limited to 500 to enhance visualization)

Source(s): Authors own work, using the VOSviewer software mapping analysis

this section. The bibliographic coupling binding force produced a group of studies that provide a new perspective on the most connected and fundamental research approaches that support the intellectual structure that links sustainability, SC and capabilities.

3.2.2.1 Journals and country distribution among the clusters. An analysis of scientific journals significantly contributed to the topic of this study. Figure 8 presents the journals that contribute the most in each cluster, namely: Cluster 1 (red nodes) – *International Journal of Production Economics* (five documents), *Journal of Cleaner Production* (three documents), *Supply Chain Management* (three documents); Cluster 2 – *Journal of Cleaner Production* (three documents) and *International Journal of Production Research* (three documents).

Finally, six different journals with one article each concentrated in Cluster 3. This map of journals indicates the significance of these journals for researchers in the fields of SSCM and capabilities, which are also represented from a variety of perspectives, including SCM, business strategy, production, operation management, environmental management, logistics, SCs, and technological, organizational and informational systems. The interdisciplinary aspect of the field can thus be observed (Figure 9).

The contributions from various geographic localities were analyzed. Figure 10 illustrates the country publication pattern of the bibliometric analysis. A total of 19 countries contributed among the clusters, the most influential being the following: Cluster 1 (red nodes) – Germany (five documents), followed by the United Kingdom (four documents) and China (three documents); Cluster 02 (green nodes) – the United Kingdom, India and Hong Kong (two documents each); and Cluster 3 (blue nodes) – France (two documents). In terms of continents, in Clusters 1 and 3, Europe has the highest contribution, followed by Asia; in Cluster 2, Asia is the most influential continent (Figure 11).

3.2.2.2 Research methodology among the clusters. We adopted the same classification as that used by Seuring and Müller (2008a, b), namely, (1) theoretical and conceptual studies, (2) case studies, (3) surveys, (4) modeling papers and (5) literature reviews. Figure 12 presents the classification of the articles into different research type categories. Studies with a different number of methodologies used can be observed among the clusters, for example, Cluster 1 – literature review is the most published, contributing to 35% of studies; Cluster 2 – survey is

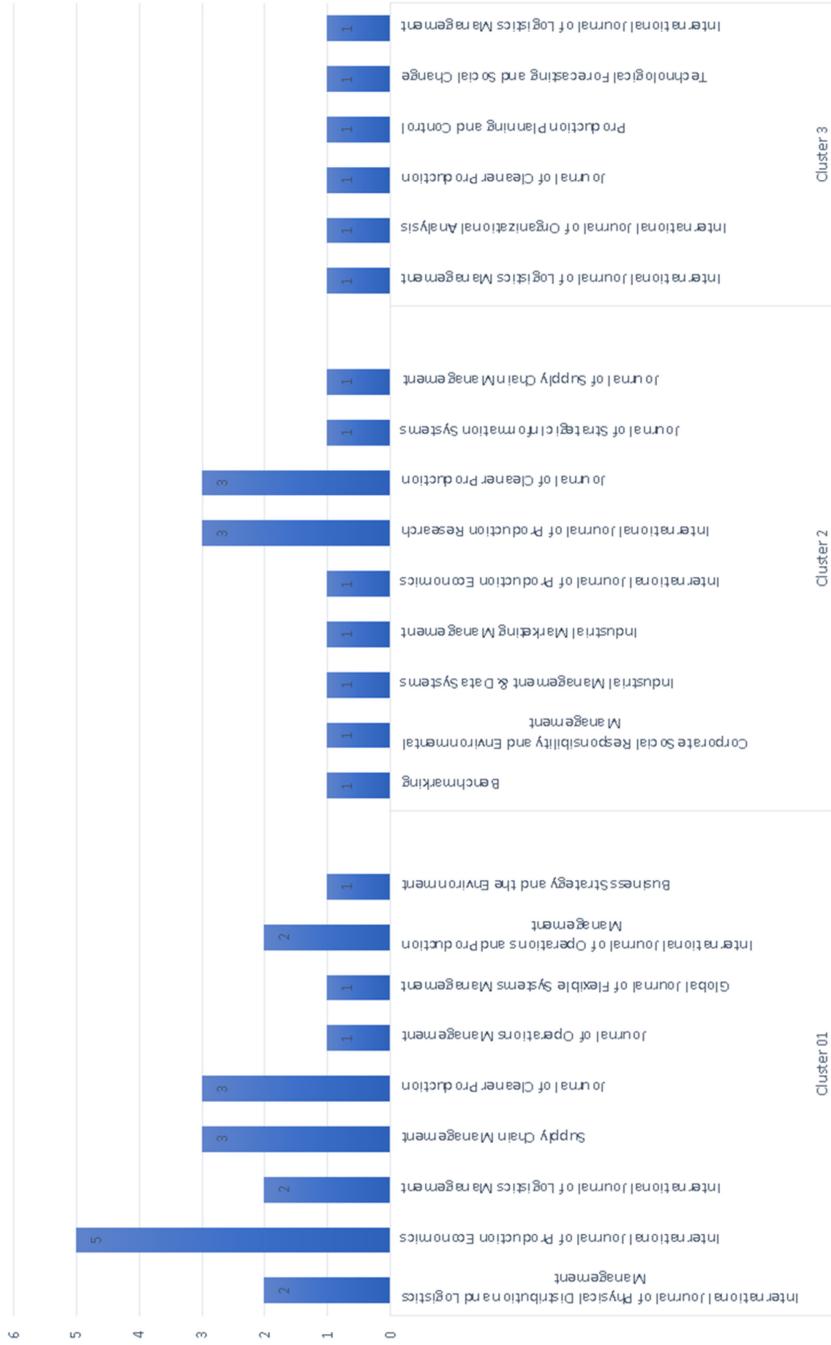
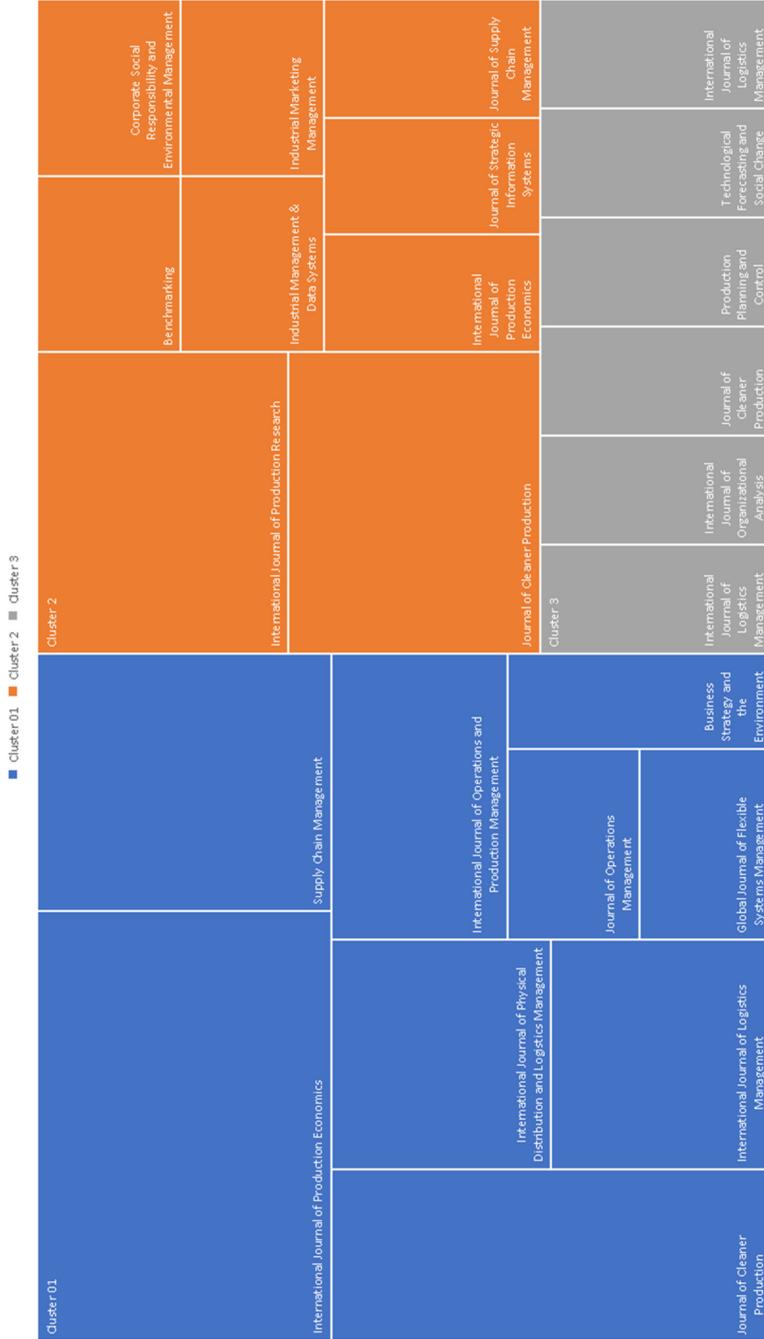


Figure 8. Journal distribution among the clusters

Source(s): Authors own work, based on the SCOPUS database and VOSviewer analysis

Distribution of Journals among Clusters



Source(s): Authors own work, based on the SCOPUS database and VOSviewer analysis

Figure 9. Visual density of journals among the clusters

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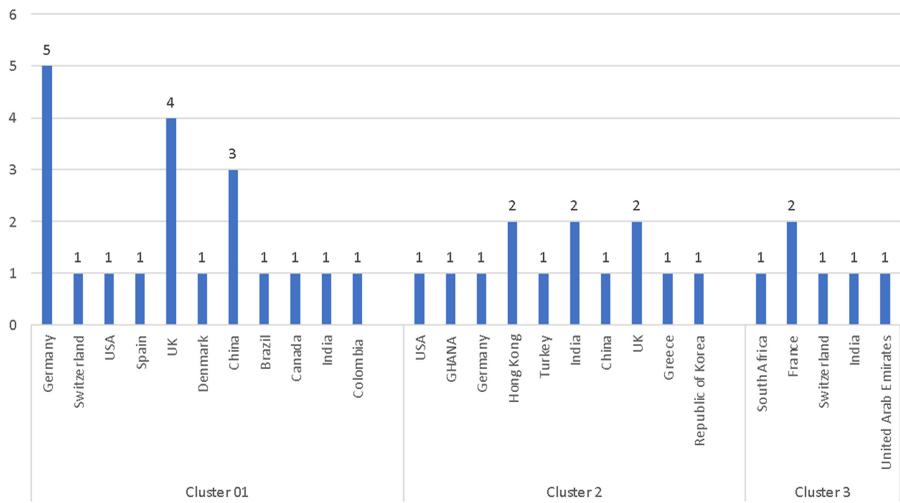


Figure 10. Countries' contributions among the clusters

Source(s): Authors own work, based on the SCOPUS database and VOSviewer analysis

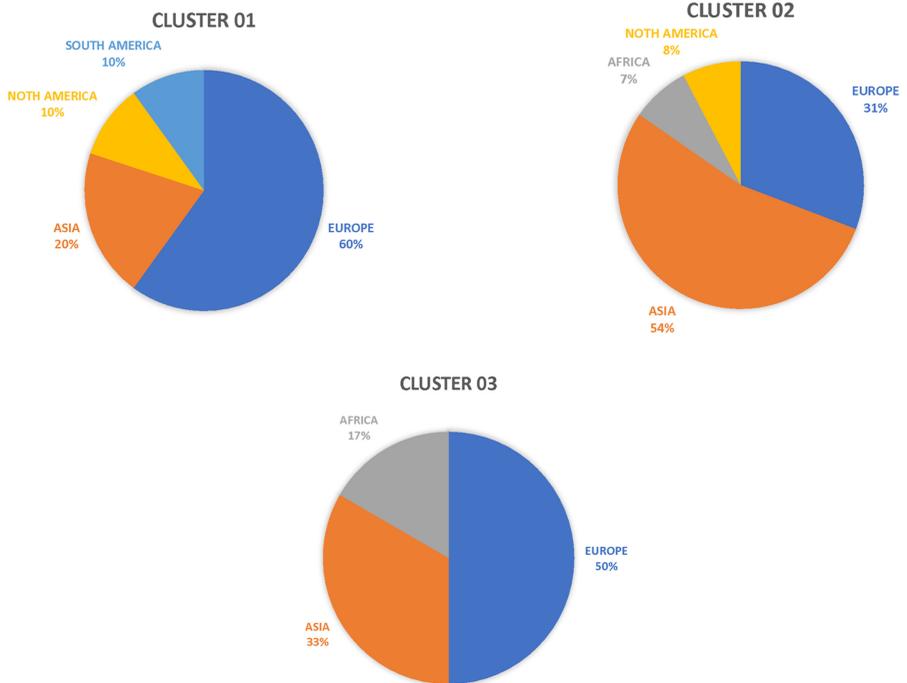


Figure 11. Continents' contributions among the clusters

Source(s): Authors own work, based on the SCOPUS database and VOSviewer analysis

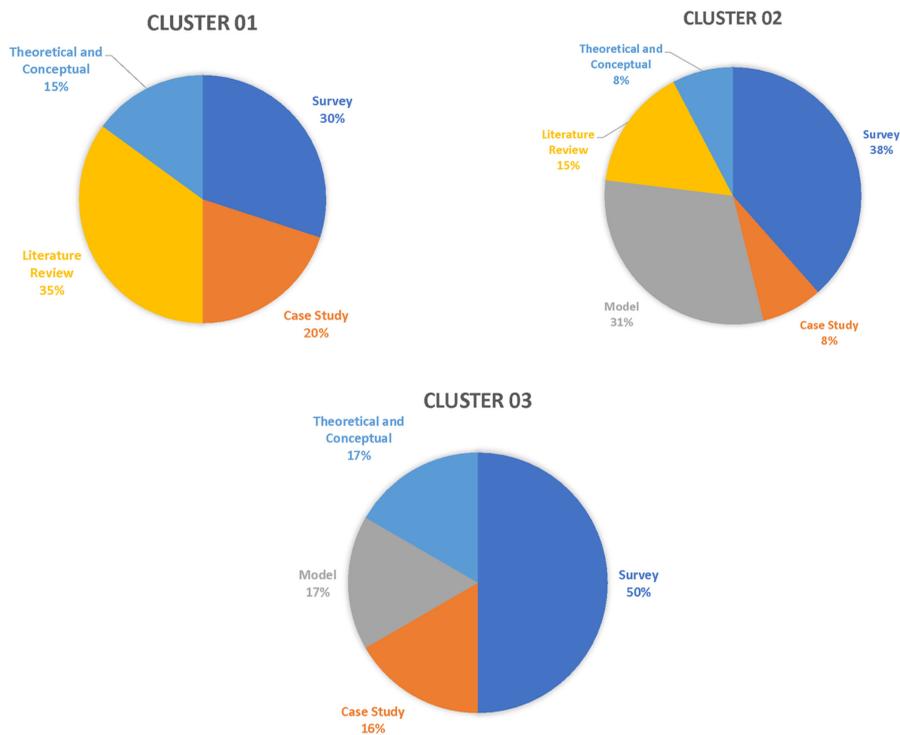


Figure 12. Research methodology among the clusters

Source(s): Authors own work, based on the SCOPUS database and VOSviewer analysis

the most used methodology (38%); and finally, Cluster 3 – surveys (50%). A few studies were conducted in combination with two or three methodologies, for example, case studies and interviews.

3.2.3 Clusters content analysis. 3.2.3.1 Cluster 1: stakeholder pressure and capabilities to implement sustainable practices. Cluster 1 is the largest cluster of analysis and is represented by the group of red lines and red nodes in Figure 6. It includes a group of 20 articles published between 2012 and 2019, which has a predominant focus on the capabilities of implementing sustainable practices in SSCM. The research line within the cluster can be divided into three different approaches: sustainable practices, stakeholders and capabilities.

First, we find studies in this cluster that correspond to the capabilities of organizations and SSCM to implement sustainable practices, that is, the capacity of organizational learning in the implementation of sustainable practices, intra and inter-organizational collaboration, training, knowledge acquisition and stakeholder engagement (Oelze *et al.*, 2016); the implementation of circular economy (Zeng *et al.*, 2017); social logistics with responsible practices (Gruchmann and Seuring, 2018); and governance of relations (network) for the implementation of sustainability in SSCM (Lu *et al.*, 2018).

Second, and often supported by the Stakeholder Theory (Freeman and McVea, 2005), in which the principle idea is that internal and external groups influence organizational practices, especially when it comes to sustainable industry (e.g. consumers, employees, investors, communities, government, environment, etc.). Stakeholder pressure is often triggered and drives companies to adapt their resources and internal capabilities to

implement sustainability in the SC (Gong *et al.*, 2019; Govindan, 2018; Huq *et al.*, 2016). Based on this context, the company's focus on controlling and monitoring supply companies was studied in the SC (e.g. in the lower tier) to satisfy the pressures imposed by stakeholders (Meinlschmidt *et al.*, 2018). Furthermore, a few studies identify those sustainability initiatives that offer companies the opportunity to proactively interact with regulators, such as the ability to monitor, collaborate, and innovate within the SC. Certification is one of these, which ensures the transparency and control that is demanded by stakeholders (Huq *et al.*, 2016), in addition to providing a continuous learning process (Oelze *et al.*, 2016) and ensuring the mitigation of social risks (Klassen and Vereecke, 2012). Nevertheless, the transformation of stakeholder pressure into sustainable practices within the SC can also be influenced by the relational capacity within SSCM (Chen and Kitsis, 2017), as well as the ability to transmit environmental information, including consumer awareness and stakeholder engagement (Gong *et al.*, 2019).

Third, this study's approach is based on and supported by the RBV (Hart, 1995) and DC theories (Teece *et al.*, 1997). This relates to the competitiveness of an organization being derived from specific organizational resources and capabilities. Therefore, the relations of practical SSCM and DC are studied in response to the dynamics of the market and the rapid changes, and imposed by consumers' demands (Beske *et al.*, 2014; Govindan, 2018), more specifically, within organizational processes, such as social logistics responsibility (Gruchmann and Seuring, 2018) and also DC that is related to business practices and performance (Hong *et al.*, 2018).

Capabilities can also result from a cumulative process of organizational learning, creating "unique resources" and less tangible ones, based on knowledge and relationships, such as organizational learning capacity, which acts as a catalyst within SSCM (Yang *et al.*, 2019), and also traceability for sustainability as a distinct meta-capability for SSCM (Garcia-Torres *et al.*, 2019). In this context, some works support the vision of resources as being: inter- and intra-organizational relationships (Yang *et al.*, 2019), collaboration (Beske *et al.*, 2014; van Hoof and Thiell, 2015), coordination (Govindan, 2018), governance and traceability (Garcia-Torres *et al.*, 2019).

It is also possible to find other theories that, although not dominant, are undoubtedly complementary. For example, Govindan (2018) integrates three theories: the *Institutional Theory*, *DC Theory*, and *Stakeholder Theory* and van Hoof and Thiell (2015) find support in the *Social Responsibility Theory*, *Network Theory*, *Neo-Institutional Theory* and *RBV Theory*.

Regarding the sustainability dimension, those works were identified that incorporated the three approaches of the triple bottom line (TBL): social, environmental and economic (Beske and Seuring, 2014; Busse *et al.*, 2016; Chen and Kitsis, 2017; Garcia-Torres *et al.*, 2019; Govindan, 2018). The economic dimension is present in the studies to some degree, as studies related to the management field were selected. The environmental dimension is also present, in the form of the ability to transmit information and the responses related to consumer concerns (Gong *et al.*, 2019), cleaner production and sustainable supply initiative (van Hoof and Thiell, 2015), as well as the practices to promote the circular economy (Zeng *et al.*, 2017). Despite not being the dominant dimension within the cluster, the social dimension is present, as is the environmental dimension (Oelze *et al.*, 2016; K. Roehrich *et al.*, 2014), and in an isolated manner in the context involving certification and transparency as forms of control and to warn stakeholders. Furthermore, the ability to monitor, collaborate, and innovate within the SC increases the management capacity in the social dimension (Huq *et al.*, 2016) and enables the mitigation of social risks, as well as the development of new opportunities and an increase in performance (Klassen and Vereecke, 2012).

In view of the cluster analysis, we understand that the strong influence of the pressures and demands by stakeholders and the construction of a commitment throughout SSCM are drivers for the development of sustainability. As stakeholders play a key role in SSCM and

GSCM, understanding the efficiency of the information environment and stakeholder engagement can also be explored. Each stakeholder has a unique sensitivity to receive and react to activities in the social and environmental dimensions (Gong *et al.*, 2019). Moreover, future studies can advance the understanding of intra- and inter-organizational factors relevant to the implementation of sustainable supplier development (Busse *et al.*, 2016). Another significant topic is the ability to exercise transparency and monitoring between the SC links, the supplier and buyer relationship being an example, using tools such as certifications (Huq *et al.*, 2016). The company goes through a path of evolution within the process of sustainable systems, which are initially subject to control, until reaching maturity for the sustainable integration of specific operations (Machado *et al.*, 2017).

3.2.3.2 Cluster 2 – green initiatives. The second cluster focuses on Green Innovation and the capabilities of companies within the GSCM. This cluster comprises 13 articles published between 2008 and 2018 and is represented by the green lines and nodes in Figure 6. Within the cluster, we can first identify the research flow originating from the approach to SC and managerial capacity – this being a key capacity to ensure sustainability and environmental management (Sigala, 2008). The other significant research flow relates to the ability to collaborate and coordinate inter-organizational resources within SCM to achieve competitive advantages (Gold *et al.*, 2010), which includes the presence of studies focused on the integration of resources and communication practices, including the transfer of information using information technology (IT) (Dao *et al.*, 2011) as well as the ability to share information internally with both the supplier and the consumer to deliver environmental integration (Wong, 2013).

Another flow of work relates to the approach to Green initiatives, using new technologies in SC and production processes, as well as the development of new systems of quality (Wang and Chan, 2013)—for example, communication and integration capabilities between organizations and stakeholders. More specifically, we found initiatives such as green marketing (Kushwaha and Sharma, 2016; Wang and Chan, 2013) and green initiatives within the sphere of manufacturing, purchasing and logistics (Wang and Chan, 2013). Companies' ability to implement green marketing for product, promotion, planning, processes, people and projects (Liu *et al.*, 2012) deserves attention. Green marketing is a form of communication with stakeholders, and in effect, is a performance assessment (e.g. branding, market share, customer satisfaction and loyalty) (Kazancoglu *et al.*, 2018). Green marketing can be useful for generating greater business opportunities (Wang and Chan, 2013), thus positively affecting company performance (Kushwaha and Sharma, 2016).

Furthermore, another research approach is related to performance, and how performance can be measured in different ways, from the financial, operational, marketing and environmental aspects. However, the trade-off between economic and environmental performance (Kushwaha and Sharma, 2016; Wang and Chan, 2013) remains a significant aspect that is addressed in the academic field, leading to such research questions as: “Does it pay to be green?” (Li *et al.*, 2016), and what is the perception of performance for different companies within the SC? This performance research flow is strongly related to the concern of scholars to measure performance; for example, to identify the parameters of performance evaluation within the GSCM (Kazancoglu *et al.*, 2018), and to discover the impact of the company's performance within the different dimensions of sustainability (economic, social and environmental) (Woo *et al.*, 2016). Furthermore, in the work of Woo *et al.* (2016), the authors found that those suppliers of the Korean construction industry that have a greater capacity to share information tended to improve their environmental collaboration, thus contributing to the reduction of green costs and the achievement of competitive advantages.

Additionally, the capability to cooperate with multiple stakeholders (Ji *et al.*, 2015) was also studied, as well as companies' capability to identify pressures levered for the implementation of strategies within GSCM (Mathiyazhagan *et al.*, 2014). Despite the

predominant focus on the orientation toward the environmental dimension or green management practices, a few studies attempt to demonstrate that sustainable performance is more than just simply reducing consumption or environmental parameters, as there exists a balance between the three dimensions of the TBL (Dao *et al.*, 2011; Gold *et al.*, 2010; Liu *et al.*, 2012).

In the theoretical field, unlike Cluster 1, few works have a defined theoretical framework and there is little evidence for predominant theories. The main theories found are *Stakeholder Theory* (Li *et al.*, 2016), *Social Capital Theory*, *Information Theory* (Woo *et al.*, 2016), *RBV* (Dao *et al.*, 2011), *DC* (Wong, 2013) and *Natural RBV* (Liu *et al.*, 2012; Woo *et al.*, 2016).

Another significant aspect that deserves mention is green initiatives, such as green marketing in countries or industries that impose restrictions and limitations on infrastructure and resources, such as the food industry. This area warrants future research and could provide valuable insights into understanding various related aspects, such as traceability to sustainability and its practical application (Garcia-Torres *et al.*, 2019). Similarly, the development of integration and relationship among multiple stakeholders, market assessment, and promotion of collaboration and cooperation within the green SC (Kazancoglu *et al.*, 2018) may also contribute to this understanding.

3.2.3.3 Cluster 3 – data technology and sustainability. The third cluster comprises six studies between 2011 and 2020 and is represented by blue lines and nodes in Figure 6. Of these six studies, five are between 2017 and 2020, which shows a working group with recent publications. Innovation and IT dominate this cluster. These studies are supported by the following theories: *Institutional Theory*, *Knowledge RBV* (Shibin *et al.*, 2018), *RBV* (Bag and Pretorius, 2020; Shibin *et al.*, 2018; Jeble *et al.*, 2018), *Contingent RBV* (Jeble *et al.*, 2018), *DC* (Dubey *et al.*, 2019; Singh and El-Kassar, 2019) and *Institutional Entrepreneurship* (Peters *et al.*, 2011).

Companies within the same SSC react differently to information. However, owing to information asymmetry in SC, transparency and integration often remain unsolved (Dubey *et al.*, 2019). Although the data itself are present in the system, the extraction of useful information from large datasets requires different and specific techniques (Dubey *et al.*, 2019). Companies' data technology capacity was previously associated with data collection and processing and storage, whereas presently, the challenge is to perform fast and reliable analysis of a large volume of data and employ technological tools. In this sense, big data and predictive analytics are company-specific capabilities that are related in sustainable systems, which offer competitive advantages and benefits within SSCM (Dubey *et al.*, 2019; Jeble *et al.*, 2018). In this regard, corporate commitment can influence the assimilation of big data, and consequently, improve sustainable performance (Singh and El-Kassar, 2019).

Furthermore, key resources for capacity development within the technological and big data environment have been studied. Examples include the capacity for continuous learning and *organizational learning* (Jeble *et al.*, 2018). Organizational learning (Dubey *et al.*, 2019; Peters *et al.*, 2011; Jeble *et al.*, 2018) enables organizations to explore, store, share and apply knowledge (Peters *et al.*, 2011). Other significant resources include stakeholder integration (Bag and Pretorius, 2020); aspects related to technologies and innovation, such as the ability to develop the circular economy by employing 4.0 technology with big data analytics being powered by artificial intelligence (Bag and Pretorius, 2020) and innovation using *frugal technologies* (Shibin *et al.*, 2018), which establishes the connection between SSC and frugal innovations in emerging economies. The adoption of frugal technologies can be challenging owing to the existence of resource and infrastructure constraints for technological development and innovation, as well as the presence of international barriers and regulations.

Within the dimension of sustainability, the works are distributed in the search for a balance among the three dimensions (social, economic, and environmental) (Shibin *et al.*, 2018;

Jeble *et al.*, 2018). Examples of work on social and environmental sustainability include Bag and Pretorius (2020), Dubey *et al.* (2019), and Singh and El-Kassar (2019), where the latter focuses on Green aspects.

Organizational learning is, thus, viewed as a significant source of competitive advantage in a dynamic and competitive environment (Teece *et al.*, 1997). Considering that the changes imposed are increasingly rapid and dynamic, the factor of transferring and receiving information with big data is an essential capacity in the modern competitive scenario (Dubey *et al.*, 2019). Nevertheless, it should be recognized that certain countries – especially, developing countries – face resource and technological infrastructure information constraints. Finally, it is worth highlighting the significance of studies on key resources in the context of proactive strategies of sustainable inter-organizational SCs (Peters *et al.*, 2011).

4. Discussion and conclusion

The main challenge of this study was to map and identify the academic position of field research and the pattern of evolution of the emerging domain of sustainability and capabilities within SCM. Within the focus of the main objective, we attempt to clarify the issues raised during a window of 15 years of research on the subject. To this end, a combination of techniques was used, namely, a systematic literature review and bibliometric coupling, which enabled us to achieve the methodological rigor required to explore this field (Tranfield *et al.*, 2003).

To map and explore the field of sustainability and capabilities within SCM, a systematic literature review was performed in four distinct stages (Seuring and Gold, 2012; Seuring and Müller, 2008b): (1) selection of the material by structured search in the SCOPUS database; (2) subsequent description of this material (number of publications per period, journals, main authors and methodology employed); (3) category selection (clusterization), using VOSviewer® (v 1.6 15) software and (4) evaluation of the material described. Bibliographic coupling was the methodology employed for the categorization and content analysis of the material, using the VOSviewer® (v 1.6 15) software, which resulted in the production of bibliometric maps that enabled the identification of both the clusters and the relationships among the academic field (van Eck and Waltman, 2010; Freire and Veríssimo, 2021).

Recently, a few researchers have presented systematic reviews related to SCM, including Jia and Jiang (2018), Nimsai *et al.* (2020), Dubey *et al.* (2017), and Choudhary and Sangwan (2022). However, these literature reviews focused on definitions, pressure, green practice, sourcing and performance, as well as sustainability in SCM, rather than exploring the interaction of two different domains through bibliometric analysis. Bari *et al.* (2022) conducted a literature review using the DC theory and corporate sustainability; however, our work contributes to mapping the intellectual knowledge and the results help to understand how SSCM strategies can be integrated with organizational capabilities. Additionally, our research brings to debate the distinction between a specific sustainable organizational capability and a traditional capability (Buzzao and Rizzi, 2021).

Our research differs from previous work in several ways. First, instead of conducting the literature review on just a sole concept or one theory, we opted to concentrate on SSCM strategies by specifically analyzing organizational capabilities through the use of a systematic literature review and bibliometric analysis. Second, our review presents a visual mapping of the intellectual knowledge compiled, which includes a visual identification of the academic field and new pathways. Finally, this study brought together two significant concepts for the industry as well as for academics, namely sustainability and capabilities within SCM.

It was possible to produce a descriptive analysis of the literature and map the academic knowledge about SSCM and organizational capabilities by performing an analysis using the

systematic literature review of the SCOPUS database, and also by performing bibliometric coupling using VOSviewer and NVivo. The results obtained were considered relevant for finding the most pertinent information for the academic field and enabled us to answer the research questions.

The *descriptive analysis of the literature* (RQ1 and RQ2) questions were answered by analyzing the volume of the publication, the most influential journals, the main authors and also the research methodology employed. Regarding the descriptive results, we found a potential field for further academic research, as we identified a growing number of publications in peer-reviewed journals (Figure 2), which demonstrate that the research in these two domains of sustainability and capabilities within SCM has significantly progressed, resulting in a significant number of researchers and publications in scientific journals. Additionally, we identified and focused on the journal with the maximum number of publications (Figure 3). Regarding the authors, our results show the most influential researchers, with a wide range of academics conducting research in this field (Figure 4). Furthermore, we identify the most dominant research methodologies in the reviewed literature (Figure 5).

In response to the *bibliometric analysis of the literature* (RQ3) question, we identified the three lines (clusters) of research and the evolution within the academic field of capabilities and SSCM. Furthermore, we conducted a descriptive and content analysis among the clusters generated by VOSviewer, which enabled us to determine the trends and contributions to SSCM theories through organizational capability.

Once the clusters were identified, we further analyzed the literature and determined the trend and contributions of different scholars. The mapping results show that the field is divided into three clusters: (1) the first cluster (red nodes), comprising works that address the capacity of companies to implement sustainable practices within the SSCM; (2) the second cluster (green nodes), of companies where the green approach within SCM is present, with emphasis on the ability of organizations to adapt and implement green initiatives, such as green marketing, which is associated with the ability to transmit and receive information within the GSCM; and (3) the third and final cluster (blue nodes), comprising recent works, in which the following topics are presented: the capability to involve IT and innovation, the role of big data, predictive capabilities and key resource development, such as the learning organization.

Our results indicated that the majority of studies emerged from Europe and Asia and our findings are aligned with those of past studies (Govindan and Hasanagic, 2018; Nimsai *et al.*, 2020). Additionally, we found researchers in other continents, such as Africa, North America and South America, who should be encouraged to conduct further research to identify best practices and share the knowledge acquired. We also found evidence of the rapid growth of SSCM and capabilities studies after 2018, with a focus in Clusters 1 and 3, concentrating on technology, big data, organizational relationships and sustainable practices. These findings reflect the relatively greater concerns toward SSC practices, organizations' technological capabilities, and capability practices and relationships (e.g. cooperation, collaboration and coordination).

Regarding the leading journals in the field, our findings are aligned with those of previous studies (Ansari and Kant, 2017a, b; Nimsai *et al.*, 2020; Seuring and Müller, 2008a, b), where knowledge growth in this area is led by the *Journal of Cleaner Production*, *International Journal of Production Economics*, *Supply Chain Management* and *International Journal of Production Research*. However, we were unable to find a diversity of academic journals that contribute to the academic field of sustainability and capabilities within SCM.

The two most influential authors in terms of the topics of sustainable practice, DC and inter-organizational resources are Gold S and Beske P, whose names appear in both lists in terms of document citations and linked articles. In comparison to previous research studies,

this research demonstrates a visual trend of the intellectual knowledge in the literature on SSCM and organizational capabilities (Amui *et al.*, 2017; Bari *et al.*, 2022; Buzzao and Rizzi, 2021).

Some of the analyses adopted in our research were similar to those of previous studies, such as annual scientific production, journals' and authors' contribution, top-cited documents, geographical distribution of documents and research methodology (Dohale *et al.*, 2021; Mahadevan and Joshi, 2022; Nimsai *et al.*, 2020).

4.1 Theoretical contribution

The results of our research enabled us to respond to our research question: “*What is the position, lines of research, and evolution within the academic field that studies capability and the SSCM?*” Thus, we can contribute to a greater, clearer and more uniform understanding of the field of sustainability and capabilities within SCM, and also to promoting a research agenda for exploring the complementarities arising from a combination of perspectives. Furthermore, a growing academic interest in studies related to the topic is evident.

Additionally, this study produced valuable findings regarding the field of SSCM and organizational capability. It delivers results, while also contributing a descriptive and content analysis, and thus, represents a significant contribution to many significant theories in the field of SCM, such as DC (Teece *et al.*, 1997) and RBV (Hart, 1995). Our study contributes to the debate as to whether it is possible to distinguish specific sustainable organizational capabilities from traditional capabilities (Buzzao and Rizzi, 2021). Furthermore, the results can help academics and practitioners alike understand how SSC strategies can be integrated with organizational capabilities.

4.2 Research implication

Several studies have been conducted in the field of SSCM; however, this work uses a singular approach with two academic fields: a systematic literature review and a bibliometric analysis. This methodology enables us to identify the main topics required to implement SSCM through the theoretical approach of organizational capability.

Additionally, our study makes several unique contributions to the field of SCM. First, we performed two descriptive analyses of the literature, with one identifying the articles by bibliographic research in the SCOPUS database, and the other analyzing the material compiled in the clusters generated by bibliometric analysis (VOSviewer). Second, it provides a mapping and detailed comparison by means of the cluster bibliometric coupling analysis. Third, this systematic review provides a unique content analysis and identifies the trends of the SSCM and organizational capabilities literature, identifying the intellectual affinity and upcoming topics of research focus. Fourth, this study lists both the highly author-cited documents and highly influential studies within the three clusters, which represents the intellectual map approach to the study of SSCM and resource capabilities. Finally, we synthesized the knowledge obtained and presented three important clusters, each representing the lien of academic thought in the field of sustainability and capabilities within SCM. In sum, our findings can guide other researchers as they develop methods and guidelines for use in future research on SCM.

4.3 Managerial implications

This work will likely help researchers and practitioners alike by exposing the pattern and evolution of the literature. By presenting the intellectual structure of the field of sustainability and capabilities within SCM, our results can suggest the direction of future studies and the theoretical construction within the field. The mapping of connections and identification

oriented to the content enabled the discovery of paths that show possibilities for future development and academic contribution, in addition to discovering central topics within research and its subsequent application.

Furthermore, this study facilitates the ability of researchers and practitioners to understand intellectual knowledge, as well as the different paths taken and the evolution of SSCM literature and organizational capabilities. Additionally, it will help and encourage researchers, managers and policymakers to conceive new approaches to engage in the adoption of SSCM.

4.4 Limitations

This study has a few limitations, which may be opportunities for further research. The first limitation is regarding the use of a single database, SCOPUS; future studies may opt to use other bibliographic sources. Another limitation is that other keywords could have been combined to refine the search field. Future studies are advised to address the understanding of more specific issues in sustainability and include more specific keywords. Although our study examined 90 articles from several significant journals, there is a possibility that a few relevant articles were left out. Additionally, we recognize that the search for data in the literature was restricted to management journals, and the chosen questions and methods of synthesis analysis adopted are not exhaustive. Future studies may employ mixed, qualitative or quantitative methods, and develop a specific approach related to findings within the field. Finally, there is still a lack of a consolidated theoretical paradigm for the topic of sustainability and capabilities within SCM, and future studies may opt to explore this limitation.

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