

Quo Vadis Sustainable Entrepreneurship? A Systematic Literature Review of Related Drivers and Inhibitors in SMEs

Neuza C. M. Q. F. Ferreira  and João J. M. Ferreira 

Abstract—This study develops a comprehensive overview of the literature on sustainable entrepreneurship (SE) in small and medium-sized enterprises (SMEs). The primary aim is to map the research on SE in SMEs by conducting a systematic literature review of 206 articles published in refereed academic journals from 1987 to 2022. Two bibliometric analysis methods were used: bibliographic coupling and co-citation. Because the former technique is retrospective and the latter is forward-looking by nature, these methods complement each other. The results include a list of the most influential studies, top-cited sources, and six major thematic clusters: *sustainable entrepreneurial orientation, performance, innovation and networks, sustainable business models, commitment to sustainability, and green entrepreneurship and circular economy*. The dimensions that drive and/or inhibit SE in SMEs are sustainable entrepreneurial orientation, organization, performance, networks, contexts, and sustainable practices. This study is the first to combine bibliographic coupling and co-citation to analyze academic articles on SE in SME contexts. The findings provide a deeper understanding of this field's theoretical structure and facilitate the identification of potential new lines of research.

Index Terms—Bibliometric analysis, small and medium-sized enterprise (SME), sustainable entrepreneurship (SE), systematic literature review.

I. INTRODUCTION

THE Brundtland Report [1] has played an important role in stimulating more interest in sustainable development (SD) worldwide. SD is defined as “*development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs*” [1, p. 24]. Experts are also increasingly focused on meeting the challenges

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presented in the United Nations' [2] SD Goals (SDGs), which reflect significant environmental, social, and economic issues. The SDGs have triggered an upsurge in sustainability-oriented research focused on the triple bottom line (TBL) approach (i.e., social, economic, and environmental) [3].

The concept of sustainable entrepreneurship (SE) is based on SD's TBL dimensions, but a consensus has not yet been reached on SE's definition. The most prominent researchers in this field argue that SE starts with the recognition, development, and exploitation of economic opportunities [4], [5], [6], [7], [8], [9], which are generated by market imperfections that motivate companies to develop new products, processes, or services [4], [5], [6]. This process must consider the environmental and social changes caused by innovations [10], as well as future generations' well-being [11].

According to Klewitz and Hansen [12], one of the best ways for firms to foster sustainability is through innovation (e.g., improved products and processes or organizational transformation). Multiple studies have confirmed that many firms are seeking to implement sustainable practices (e.g., [10], [12]), but how this process occurs in different types of firms (i.e., large or small and medium-sized enterprises (SMEs)) remains unclear. More research is needed to understand SMEs' role in this process, in particular because they comprise the majority of companies and business activities around the globe [13], including being responsible for a large proportion of environmental pollution [14]. In addition, compared to large firms, SMEs' organizational structure allows them to adjust more easily to changes in the market and to make faster decisions [14], [15], [16].

The existing literature includes systematic literature reviews (SLRs) of studies of SE in the broadest sense (i.e., [17], [18], [19], [20], [21], [22], [23], [24]). Some SLRs have specifically focused on stakeholders' role (i.e., [25]), start-ups' impact and assessment (i.e., [26], [27], [28]), ecopreneurship (i.e., [29]), responsible entrepreneurship (i.e., [30]), the sports sector (i.e., [31]), the environment (i.e., [32]), digital technologies (i.e., [33]), emerging economies (i.e., [34]), and SMEs' innovation practices (i.e., [12]). More detailed information about these prior SLRs can be made available as supplementary data upon request.

Previous SLRs have reported that SE research is still in an early stage (e.g., [27]) and quite diverse (e.g., [33]). This field is also characterized by fragmented and mixed approaches from

a practical and semantic perspective (e.g., [26], [27]), which hampers the development of a deeper understanding of related topics. More specifically, the only SLR focused on SE in SMEs (i.e., [12]) covered a 1987–2010 period and relied on qualitative thematic analysis centered around product, process, and organizational innovation.

The present study thus sought to fill the main gaps identified, including the need to conduct updated temporal statistical analysis and to map SE in SMEs using different bibliometric approaches (i.e., co-authorship, co-occurrence, co-citation, and/or bibliographic coupling). Another objective was to explore SE research linked to SMEs and to pay explicit attention to the TBL dimensions (e.g., [18], [24]). The current investigation further explored SMEs' capabilities, competencies, and unique advantages in terms of sustainable practices [12] and identified possible determinants (e.g., contextual factors) of SE or related initiatives in these firms [23].

The present research's approach was distinct from that of previous SLRs as it sought to develop a holistic framework of SE-related studies focused on SMEs by conducting an up-to-date bibliometric review. The results thus make three major contributions. First, the analyses defined SE-oriented thematic clusters in SME contexts, which facilitated the identification of the existing literature's main gaps and the formation of a future research agenda. Second, this investigation sought to identify SE determinants and/or initiatives specifically related to SMEs grounded in bibliometric analysis of the most recent publications because the last similar SLR's results stopped more than 10 years ago. Last, both co-citation and bibliographic coupling methods were applied. The latter focuses on citing within documents, remains retrospective, and takes a more static approach (cf. [35]). In contrast, the co-citation technique concentrates on cited publications, and it is prospective and dynamic (cf. [35], [36], [37]). Combining both methods ensures more accurate, unique information is captured [38].

The current study sought to answer the following research questions:

- 1) What methodologies have been used to analyze SE in SMEs?
- 2) What are the main thematic clusters of SE-related publications focused on SMEs?
- 3) What determinants and/or initiatives drive and/or inhibit SE in SMEs?

In addition, an integrative framework was developed based on the determinants and/or initiatives found to provide a holistic view of this topic. The bibliometric analysis covered 206 academic articles published from 1987 to 2022. The results include the most prominent SE thematic clusters for SMEs: *sustainable entrepreneurial orientation, performance, innovation and networks, sustainable business models, commitment to sustainability, and green entrepreneurship and circular economy*.

The rest of this article is structured as follows. Section II presents the research methods. Section III discusses the descriptive analysis, thematic evolution, bibliographic coupling, and co-citation, Section IV discusses research agenda results.

Finally, Section V offers the study's conclusions and limitations, as well as providing suggestions for future investigations.

II. METHODS

To address the predefined research questions, the present study conducted bibliometric analysis to ensure a more quantitative literature review. Donthu et al. [39], Pereira and Bamel [40], and Rocha and Ferreira [41] observe that SLRs use statistical methods to understand a research field's anatomy and/or structure by examining prominent authors and their associations. The findings provide scholars with a more solid basis on which to position their latest contributions and select new lines of future research. The current research followed the procedures applied by Cristo-Andrade and Ferreira [42], Gutierrez-Gutierrez and Anthony [43], and Malerba and Ferreira [44]. The present study protocol thus comprised of the following:

- 1) a formulation of research questions;
- 2) database selection;
- 3) definition of the search string;
- 4) criteria identification;
- 5) review of prior research;
- 6) integration of outcomes.

The analysis carried out identified groups of SE-related research focused on SMEs, determinants, and initiatives that drive or inhibit SE in these firms, and the most important authors and their geographical background and corresponding authorship networks. The bibliometric maps were extracted using VOSviewer (see www.vosviewer.com), Bibliometrix R-package (see www.bibliometrix.org), and SciMAT (see <https://sci2s.ugr.es/scimat/>) software. The final theoretical framework was developed using SimpleMind Pro (see www.simplemind.eu).

Scopus provided the list of sources as this database is known to be one of the “*most wide[ly] used ...] databases on different scientific fields which are frequently used for searching the literature*” [45, p. 18]. Compared to Web of Science, Scopus offers a more thorough coverage of social sciences and management publications (cf. [36], [46]).

The current study's search string contained the following terms: (“*sustainab* entrepreneur**” OR “*green entrepreneur**” OR “*eco* entrepreneur**” OR “*ecopreneur**” OR “*environ* entrepreneur**” OR “*enviropreneur**” OR “*sustainopreneur**” OR “*sustain* ventur**” OR “*sustainable development goals**” OR “*innovat* entrepreneur**” OR “*SDGs*”) AND (“*small and medium sized enterprise**” OR “*SME*” OR “*SMEs*” OR “*medium business**” OR “*small business**” OR “*small firm**” OR “*medium firm**”). To ensure homogeneity, the sample was limited to articles published in international journals, so reports, books, and conference proceedings were excluded. No time restrictions were imposed, and the search was conducted in December 2022, resulting in 497 documents.

The sample was subsequently restricted to only articles or review articles on management, business, and economics written in English, which resulted in a list of 332 documents. Finally, a content analysis was conducted of each article's title, abstract, and keywords. A further 126 articles were removed for seven

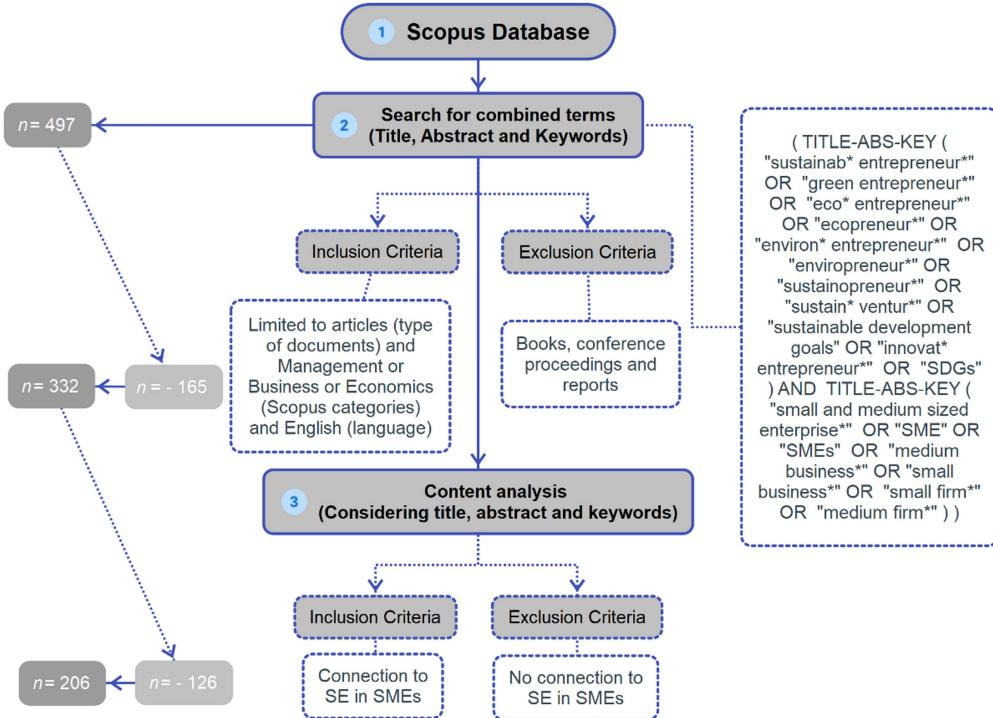


Fig. 1. Sample selection process. Note. n = number; SME = small and medium-sized enterprises; SE = sustainable entrepreneurship.

reasons. First, the contents focused on economic and ecological implications for end users or, second, on sustainability as profitable growth. Third, the authors failed to relate entrepreneurial resilience to SE. Fourth, the main focus was on tax reform and financial performance, and, fifth, SMEs were only vaguely mentioned. Sixth, sustainability was included among other indicators but was not the focus. Last, the SME acronym was unrelated to SMEs (e.g., sustainable mineral extraction). The remaining documents were included because they were specifically focused on SMEs and green entrepreneurship, sustainability, ecopreneurship, environmental performance, corporate social responsibility (CSR), SD, or SDGs. As shown in Fig. 1, the final sample included 206 documents.

The database output was further refined and standardized by creating a thesaurus file, which was uploaded to VOSviewer to merge all the different references list formats and authors and journals' names [47]. The articles' keywords were also analyzed, and their spelling was manually corrected (e.g., "sustainable development goals" and "SDGs") using both Bibliometrix R-package and SciMAT.

III. RESULTS

A. Descriptive Analysis

This SLR was thus based on 206 articles published between 1987 and 2022, with a focus on SE in SMEs. The publications feature a total of 122 sources, 588 authors, 14 086 references, and 710 keywords. Fig. 2 shows the evolution of these publications and their respective citations by year.

According to Fig. 2, the number of papers published until the end of 2015 is quite low. However, 2016 is a turning point as the number of publications in this field grew significantly (11 articles), with the highest totals reached in 2020 (37), 2021 (38), and 2022 (54). The growth rate of citations per annum is relatively moderate compared to the number of articles published in the last three years, although more recently published articles may lead to future citations, which will probably raise the number of citations each year.

The database analysis revealed that the top-5 most productive countries are Malaysia (11), followed by Indonesia (10), Italy (8), South Africa (7), and Canada (6). Regarding methodology, most studies are qualitative (43%), quantitative (41%), multi-method (11%), and conceptual (5%). Fig. 3 presents a summary of the main methodologies used to analyze SE in SMEs.

According to Fig. 3, the five most commonly used methods are interviews (24%), case studies (19%), other (e.g., cluster analysis) (14%), regression (13%), partial least squares structural equation modeling (PLS-SEM) (12%), and SEM (7%). These results answered the first research question listed in the introduction.

The statistical analysis next focused on the number of documents published in the SE field that are related to SMEs. The top five journals are *Sustainability* (39), *Business Strategy and the Environment* (9), *Journal of Cleaner Production* (6), *Corporate Social Responsibility and Environmental Management* (5), and *International Journal of Entrepreneurial Behavior and Research* (5) (see Fig. 4).

The most cited documents were found to be the following: Klewitz and Hansen [12] with 641 citations; Bocken [48] with

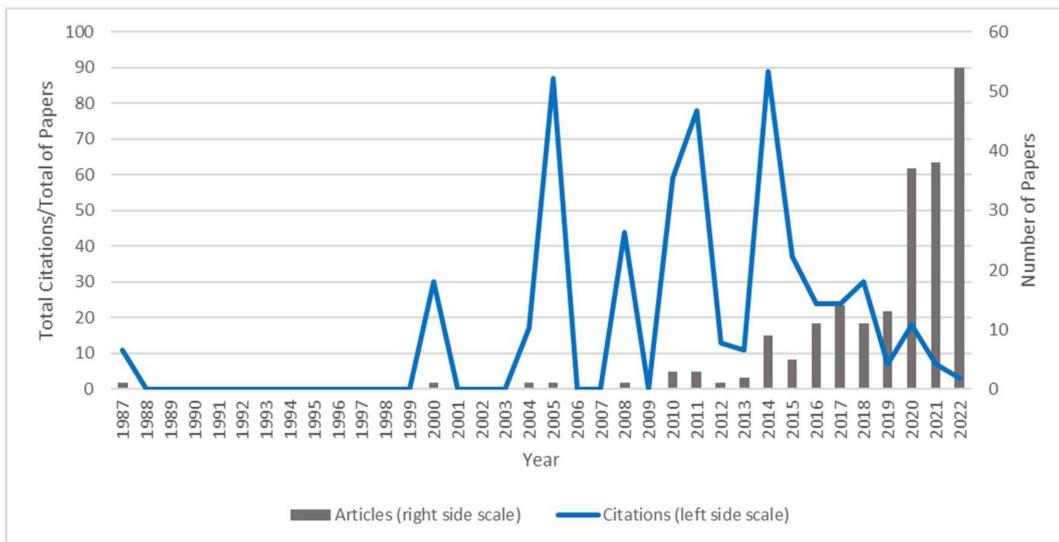


Fig. 2. Evolution of articles and citations (1987–2022).

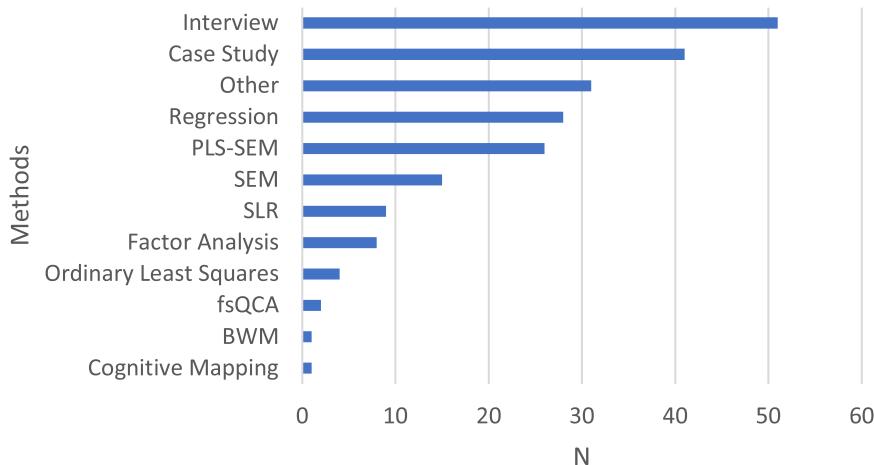


Fig. 3. Most frequently applied methods. Note. PLS-SEM = partial least squares-structural equation modelling; SLR = systematic literature review; fsQCA = fuzzy-set qualitative comparative analysis; BWM = best-worst method.

144 citations; Spence et al. [49] with 136 citations; D’Amato et al. [50] with 113 citations; and Xia et al. [51] with 101 citations (see Fig. 5).

All of the top-five studies are qualitative, and they make the following contributions.

- 1) Thematic analysis of sustainability-oriented innovations by product, process, and organizational innovation related to SMEs’ innovation practices and sustainability behaviors [12], especially highlighting these firms’ advantages and disadvantages in eco-innovation development.
- 2) Clarification of venture capital’s role in providing financial, consultancy, and network support to successful sustainable businesses [48], including underlining that investors struggle to identify companies with the potential to generate financial returns and positive environmental and social impacts simultaneously.

- 3) Analysis of SE fundamentals through a comparison of international examples of SME practices [49], suggesting that sustainable practices’ adoption depends on entrepreneurs’ values and external stimuli and that support programs must be adapted to match individual, firm, and country-specific characteristics.
- 4) Examination of circular bioeconomy business models, indicating that substitution with natural, renewable processes (e.g., renewable resources in production) and maximization of materials and energy efficiency (e.g., reduction of raw material or transport costs) are the most popular [50].
- 5) Analysis of the status of CSR in the construction sector [51], revealing that the practices with the greatest impact on the surrounding community are social procurement, social enterprise, community consulting, corporate volunteering, and indigenous reconciliation.

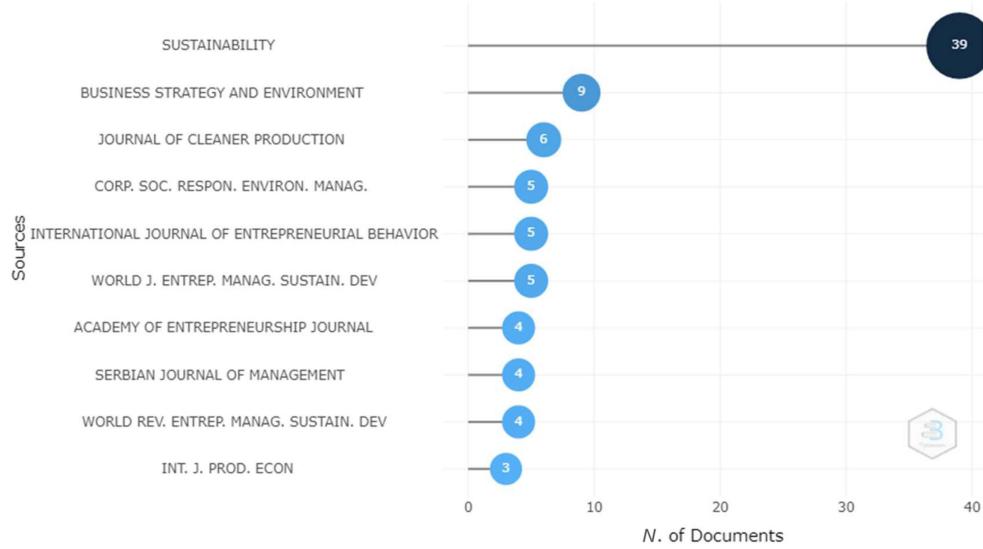


Fig. 4. Top-10 most important journals by number of publications. Note. N = number.

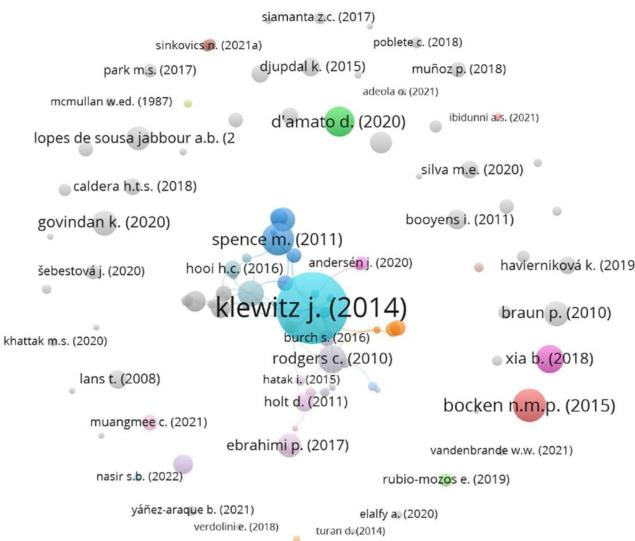


Fig. 5. Most frequently cited publications. Note. Minimum number of citations: five.

The top-five studies present the common argument that SE involves incorporating sustainable principles, such as resource efficiency, circular economy approaches, and social responsibility into the core business strategies of SMEs. By doing so, SMEs can create value not only for themselves but also for society and the environment. The authors of these top-five studies argue that SE can lead to improved financial performance, enhanced reputation, increased innovation, and resilience in the face of environmental challenges. Furthermore, they emphasize the need for collaboration and partnerships among SMEs, government agencies, nonprofit organizations, and other stakeholders to promote SE. They additionally discuss the importance of policy support, access to funding and resources, and knowledge sharing

networks to foster SE among SMEs. Overall, the authors of these studies advocate for a holistic approach to entrepreneurship that integrates economic, social, and environmental dimensions. They stress the potential of SE to contribute to SDGs, address environmental challenges, and create a more inclusive and resilient economy.

B. Thematic Evolution

Bibliometrix and SciMAT were used to analyze the publications appearing between 1987 and 2022 that focused on SE in SMEs. The results include the evolution of themes based on the authors' keywords. The number of publications per theme highlights variations over time.

Time-splitting methods most often divide periods into equal segments, but this SLR opted to split up the years according to the evolving volume of publications. The first period corresponds to 26 years (i.e., 1987–2012), the second period 7 years (i.e., 2013–2019), and the last period 3 years (i.e., 2020–2022). In addition to having the largest number of publications, the last period reveals the most recent trends.

Fig. 6 shows the most prominent topics' evolution over time, while Fig. 7 presents the keyword flows within these periods. The initial database comprised a total of 710 keywords, but repeated keywords were then identified and harmonized by both Bibliometrix and SciMAT. This procedure produced a final total of 521 consistent keywords.

In the first period (i.e., 1987–2012), the topics mostly focused on *small businesses*, *SMEs*, and *SE*. The first and second periods together included only 37 (76%) of the 49 keywords related to these themes. In the second period (i.e., 2013–2019), more varied topics emerged—*SDGs*, *green entrepreneurship*, *entrepreneurship*, *sustainability*, and *ecopreneurship*—with 321 keywords mentioned. That is, 284 new keywords were added to the previously mentioned 37.

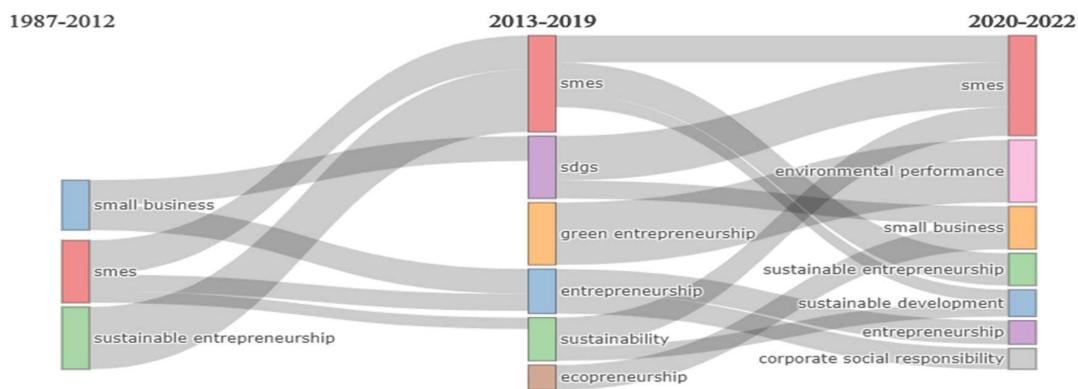


Fig. 6. Sankey diagram of sustainable entrepreneurship in small and medium-sized enterprises topics' evolution over time. Note. SMEs = small and medium-sized enterprises; SDGs = Sustainable Development Goals.

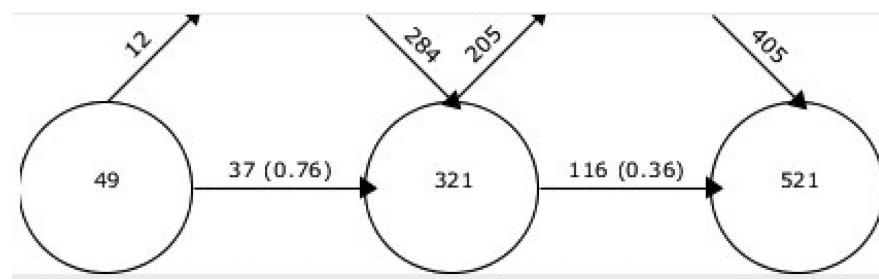


Fig. 7. Number of keywords related to sustainable entrepreneurship in small and medium-sized enterprises in three periods.

In the third period (i.e., 2020–2022), the topics related to SDGs and sustainability converged on *SMEs*. Other themes such as *SDGs* and *ecopreneurship* congregated around *small businesses*. Only 116 keywords remained (36%) of those included in the second and third phase, but 405 new keywords emerged, for a total of 521. The topics of *SMEs*, *small business*, and *SE* remained, while fresh themes emerged: *environmental performance*, *CSR*, and *SD*.

The next step was to conduct bibliographic coupling and co-citation analyses. Bibliographic coupling “occurs when two documents cite a common third document, indicating that a probability exists that both documents address a related topic[. T]he ‘coupling strength’ of two documents... [becomes greater] the more citations to other documents they share” [36, p. 904]. Co-citation, in turn, “takes place when two documents are independently cited by other documents” [36, p. 904]. As mentioned previously, bibliographic coupling is retrospective in nature, and co-citation is forward-looking, so these methods are complementary (cf. [35], [36], [37]), thereby justifying the present study’s use of both methods.

C. Bibliographic Coupling Results

The dimensions analyzed were identified via a coupling map. According to Aria and Cuccurullo [52, p. 968], this visual representation is produced by carrying out “coupling network

analysis and plot[ting] community detection results on a bi-dimensional map”. Each cluster is depicted so that its respective density and position mirror the number of studies included and their centrality and impact. All the references included in the clusters are coded as [An], with $n = 1$ to 206. The entire list of references organized by cluster can be obtained from the corresponding author upon request. The map in Fig. 8 shows that the research reviewed is structured around six themes: *sustainable entrepreneurial orientation* in the left upper quadrant, *performance and innovation and networks* in the right upper quadrant, *sustainable business models* in the right lower quadrant, and *commitment to sustainability and green entrepreneurship and circular economy* in the left lower quadrant. These results answer the second predefined research question.

1) *Sustainable Entrepreneurial Orientation Cluster*: This theme is covered by 21 documents. Various studies in this cluster (e.g., [A1]–[A3]) highlight the generally accepted idea that sustainability not only encompasses economic, environmental, and social (i.e., profit, planet, and people) issues but also seeks to guarantee a better life for current and future generations.

However, many SMEs still do not fully understand sustainability. These companies are slow to adopt and implement this approach [A2] mainly due to their leaders’ entrepreneurial orientation, scarce internal and external resources, or the absence of formal structures and specialized employees. The exceptions to this pattern are usually smaller and newer firms as they tend to integrate sustainability more fully into their business objectives

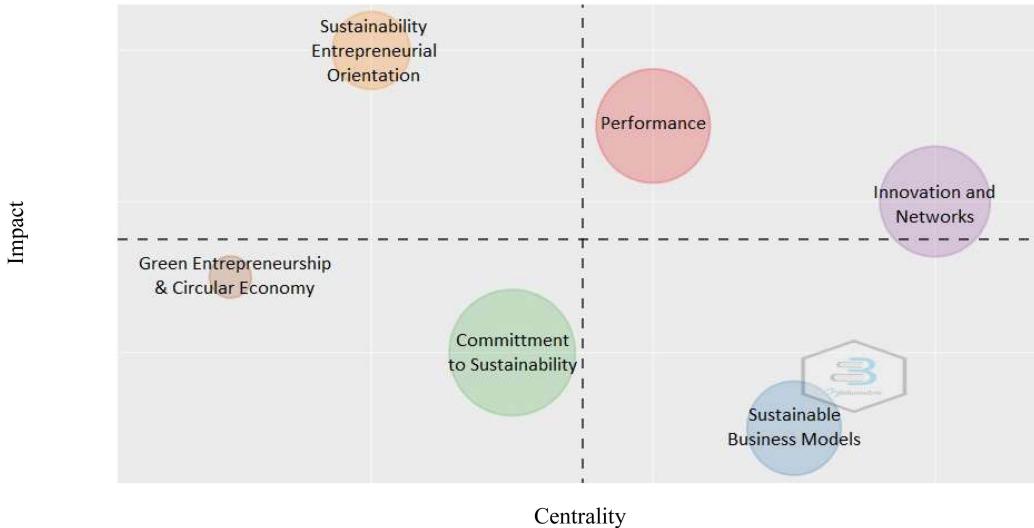


Fig. 8. Document coupling thematic map of clusters.

[A2]. Thus, a key factor influencing SMEs' sustainability is their entrepreneurial orientation. The latter is based on the ability to be innovative and adaptive, as well as making use of available resources (i.e., entrepreneurial bricolage) in order to recognize opportunities and create business solutions [A4].

Previous analyses of entrepreneurial sustainability orientation have been based on three main points of view: entrepreneur, organization, and context. SMEs' sustainability orientation strongly depends on their leaders, so some authors (e.g., [A5]) have reported that entrepreneurial characteristics are the most important component. Founders' vision and sustainability-oriented entrepreneurial intention are influenced by cognitive factors, such as personality traits [A6], [A7], values [A7], motivation to create innovative pro-environmental and social solutions [A8], [A9], self-efficacy, attitudes [A10], and opportunity awareness. The latter characteristic entails an awareness of business opportunities and a responsiveness to these openings [A11], [A12].

More specifically, entrepreneurs are guided by values and beliefs about justice that guide their business objectives (i.e., finding an economic, social, and environmental balance) [A13], [A14] and translate into ethical decision-making processes and behaviors toward employees [A2]. Ideally, entrepreneurs are proactive and innovative [A11], and they exhibit planning skills and a long-term focus [A5]. Entrepreneurial leaders also tend toward nonconformity with existing paradigms, which makes them change agents [A7]. Their self-efficacy further involves cognitive self-assessment of knowledge and skills, which favors an alignment with innovation strategies and fosters decisions to engage in sustainable entrepreneurial activities [A15].

In addition, Choongo et al. [A2], Hosseini and Ramezani [A16], Kimuli et al. [A17], and Sarma et al. [A9] found that entrepreneurs' recognition of sustainable or unsustainable opportunities depends on knowledge acquired through experience, education, or previous exposure to sustainability practices.

Other contributing factors are social networks, entrepreneurial alertness, and resilience capability (i.e., overcoming successive failures and recovering from adverse events). The resilience issue is especially important. Prior studies (e.g., [A9], [A18]) have examined how adverse conditions produced by the coronavirus disease-19 (COVID-19) pandemic have affected numerous firms. Entrepreneurs have revealed an ability to make positive adjustments in this challenging situation (e.g., adjusting operations to include remote work by employees).

Researchers have emphasized that institutional environment is a key determinant of a stronger entrepreneurial orientation and the digital capabilities needed to adapt to adverse conditions. Together, these factors affect leaders' vision, giving them the power to inspire people (i.e., employees and other stakeholders) and create an institutional environment that favors sustainability. Entrepreneurs accomplish this by implementing appropriate communication strategies, supporting the relevant company policies, or encouraging employees to commit to sustainability [A19].

From an organizational perspective, SMEs must have a proactive [A11], innovative, and risk-taking [A7] climate and internal culture, with innovation being this approach's main outcome. These firms' resource constraints are an ever-present factor in studies, which indicate that one way to overcome this problem is through social capital (e.g., networks that facilitate access to information and other resources), especially in companies' initial stages. Other investigations have focused on human resources and entrepreneurial learning in workplace environments, which are defined by entrepreneurs.

Lans, Biemans, Verstegen, and Mulder [A20] argue that entrepreneurial learning is a process that depends on external interactions, task characteristics, and internal communication, support, and guidance. This process is especially important because human resources are a critical factor that differentiates SMEs from their competitors, and staff members' well-being

and a good working environment are crucial. Social events should also be organized that not only motivate employees but also show concern for the surrounding community.

Various authors (e.g., [A19]) have confirmed that SMEs' strategic sustainability orientation can be related to external pressures, and this focus in turn has a positive influence on entrepreneurial activities. External pressure alone, however, is not enough to make these companies commit to sustainability. Other factors need to be integrated into SMEs, such as a responsible leadership culture, because decisions strongly depend on top management. According to Crnogaj et al. [A11] and Muñoz [A12], sustainable decision making should focus on implementing measures that affect people and the environment. This impact can be measured by systems that control, track, and generate reports about sustainable practices. Some researchers argue that SMEs lack these formal procedures, but other studies have provided evidence of formalized management approaches and quality standards [A7].

Cunha, Kastenholz, and Carneiro [A21] and Mendes et al. [A5] observe that sustainable entrepreneurial ecosystems are composed of multiple elements including, among others, venture capital, support organizations, human capital, markets, and these components' interrelationships. SMEs' economic context and sociocultural environment can offer sustainable business opportunities, especially when regulations, public concern, or top management's commitment provide greater impetus. These conditions are more likely to be present when governments make a global commitment to SD.

Finding opportunities for entrepreneurship in combination with SD [A7] is SMEs' greatest challenge. These companies' sustainable entrepreneurial orientation should seek to create social value [A11] by promoting a greener future and acting as a role model in the search for solutions to environmental and/or social problems, as is the case of eco-innovations. These opportunities can arise through SMEs' relationships with different partners.

Kraus et al. [A7] suggest that key actors' involvement in local communities (e.g., event organization) and in training initiatives focused on recycling or responsible consumption encourages changes in consumers' mindset. A special emphasis needs to be placed on governments' role in developing support programs (e.g., subsidies or funding) that foster SMEs' sustainable practices [A18]. One significant sustainability practice is lean thinking, that is, reducing waste or eliminating activities that bring no value to the firm involved. This practice guides companies toward financial sustainability operationalized as growth, which can be achieved through joint investment in research and development (R&D) [A3].

2) *Performance Cluster*: The performance theme is found in 44 publications, and the corresponding cluster appears in the right upper quadrant. The research included in this cluster focuses on factors influencing sustainable performance from a sustainability and financial perspective. This type of performance is closely related to SMEs' sustainability orientation [A22]–[A24]), with the primary goal of achieving good results in terms of the TBL (i.e., economic growth, social cohesion,

and environmental protection). On the one hand, this cluster's authors argue that entrepreneurial leadership and innovation—especially open innovation—positively influence SMEs' social and environmental performance and that investment in R&D improves financial performance [A25], [A26]. On the other hand, government support is seen as a positive factor that varies depending on the subsidies available to SMEs.

Various studies have concentrated on understanding how SMEs' performance is influenced by financial results, arguing that these companies can meet stakeholders' sustainability expectations if managers avoid compromising commercial goals. Other investigators assert that green entrepreneurial orientation, innovation, dynamic capabilities, knowledge management practices, government actions, and social networks have the greatest impact on performance [A27]–[A37].

To improve their performance levels, SMEs implement management systems (i.e., business intelligence, accounting information systems, or enterprise resource planning) to integrate information and evaluate sustainability-oriented strategies. These tools support more informed decision making based on multiple indicators (e.g., product quality, material and energy consumption, recycled material use, customer satisfaction, working conditions, R&D, and innovation) [A38]. SMEs implement these systems to a lesser or greater extent depending on top management support, entrepreneurial and technological orientation, external pressures, market intelligence, or knowledge management [A39], [A40]. Some management tools are well accepted (e.g., balanced scorecard [A41]). Others have been found to be overly complex or maladjusted to SMEs' reality (e.g., SDG Compass [A42] or the Economy for the Common Good [A43]), proving to be time-consuming and weakening these firms' commitment to SDGs.

The dissemination of results to diverse stakeholders is just as important as the above systems' implementation for SMEs' sustainable practices. The Global Reporting Initiative [A44], [A45] has been identified as a tool offering standardized sustainability reporting guidelines that reduce information asymmetry. However, this initiative's dissemination is still limited, especially among small firms outside industries with a high environmental impact [A46].

Certifications (e.g., ISO 14001) [A47] are the most common means of acknowledging firm performance, improving corporate image, transmitting credibility to stakeholders, and emphasizing contributions to a clean environment. Certifications are thus a unique resource that allows SMEs to focus their internal activities on innovations related to more efficient practices (e.g., energy consumption reduction, waste management, or novel methods), which have a positive impact on efficiency and profits [A48]. Although certifications are extremely important, they are regularly associated with high costs and complex and time-consuming processes (e.g., changes to practices to meet requirements, employee training, or audits). Investing in this process also has little effect on achieving competitive advantages [A49], [A50].

SMEs constantly struggle with constrained resources, restricted access to financing for green projects, and trouble

achieving sustainable finances [A51]–[A54]. These companies' performance can, however, be improved by applying the environmental, social, and governance (ESG) approach, which incorporates financial and nonfinancial factors into business decisions. Some financial products are suitable for green and/or sustainable projects that contribute to community and environmental practices, but many SMEs are unaware of these sources of funding. These firms have no knowledge of how to access this financing [A55], which means their owners need to be more proactive and seek training in SD, ESG, and sustainable finance.

Venture capitalists' role is especially crucial to ensuring successful sustainable businesses [A56], [A57]. The greater SMEs' financial resources become, the more they can invest in sustainable initiatives (e.g., renewable energies) [A58] and lower their risk. Venture capitalists, nevertheless, have difficulty identifying which companies have the potential to generate financial returns and positive environmental and social impacts simultaneously. Overall, the main barriers to investments are the lack of suitable investors; strong, established industries; and investors' short-term mindset. Financiers are motivated to invest by their belief that sustainability is good business and by their search for new approaches, which means SMEs need to develop risk management models that attract investors. The limited implementation of this type of model is usually due to business size [A59].

In addition to venture capitalists, other actors can support sustainable businesses: governments, incubators or accelerators, and the general public [A56]. Governments can support SMEs directly or indirectly through policies that attract more investment. Incubators in turn provide basic services, funds, and access to business networks. Finally, the public plays a major role in new collective forms of financing such as crowdfunding. Some authors in the performance cluster also refer to the importance of more inclusive formal financing [A60] and fintech (i.e., financial firms that use technology to improve their commercial activities), which promote financial inclusion and the adoption of SDGs. These sources of funding are particularly important for SMEs operating in underdeveloped sectors that are strongly associated with social funds and charitable programs [A61], [A62].

SMEs' performance depends heavily on their human capital (i.e., staff members' skills, experience, and knowledge), so managers must ensure their current and future employees have a good quality of life [A63]. SMEs operating in high-tech sectors thus benefit from better financial performance than firms in other sectors due to the former's highly specialized human capital and appropriate allocation of skilled personnel to innovative entrepreneurial activities [A64], [A65]. Most SMEs have yet to develop a knowledge management system [A31], so their performance depends on using technologies to gain access to large amounts of up-to-date data on market trends and consumer needs (i.e., a market learning orientation).

Another significant factor for performance is digital strategies that allow SMEs to use appropriate technology to reduce waste and manage their resources better. These tactics also help

companies to be prepared to deal with adverse conditions (e.g., COVID-19) and to use technology to find business opportunities and generate good results. Digital business strategies are often the only way that SMEs can achieve competitiveness and, in the long term, sustainable development.

3) Innovation and Networks Cluster: The other theme in the right upper quadrant is innovation and networks, with 39 documents. Most researchers in this cluster argue that SMEs need to design strategies using innovative technologies and methods to protect the environment and social cohesion [A66], [A67]. To this end, SMEs should develop a high level of digital readiness based on an ideal combination of technological and managerial skills that favor a technology-intensive environment and sustainable business operations [A68]–[A72]. Entrepreneurs must become more aware of the importance of digital transformations based on digitainability, which combines the positive aspects of digitalization and sustainability [A71], and innovation—especially disruptive forms.

These transformations create favorable conditions for new sustainable business models, SME competitiveness, and Industry 4.0, namely, the use of disruptive technologies and methods focused on improving processes' efficiency and productivity along the value chain [A71], [A73]–[A76]. For digital transformation to take place, SMEs need to have dynamic digital capabilities that drive business innovation processes through the integration of technologies (e.g., the Internet of things, artificial intelligence, Big Data, cloud computing, or blockchains). This strategy has a positive impact on organizational performance and digital innovation [A77]–[A81].

Due to their constraints, most SMEs engage in reactive behaviors triggered by external pressures related to social and environmental concerns, which usually result in incremental innovations [A82]. Eco-innovation is the most obvious way that SMEs can move their activities toward sustainability. This type of innovation is manifested through organizational (e.g., reorganized routines and structures), product (e.g., eco-design), or process (e.g., pollution control or clean production) improvements [A82]. The resulting performance can be measured through spending on innovation and R&D, patents, new product sales data, or other firm innovation data [A83].

Entrepreneurial ecosystems comprise institutional arrangements to legitimize, regulate, and encourage entrepreneurship; gain access to resources (e.g., knowledge) and financing; and strengthen workers' networking competence [A84]. At a policy level, governments must reduce bureaucracy and increase their support of public and private initiatives focused on entrepreneurs with innovative ideas for new small firms as the latter have higher innovation and performance rates [A85]–[A89]. SMEs can collaborate with radical innovators to create highly inventive processes, and these companies' selection of partners is extremely important to raising innovation rates across regions [A90], [A91].

Cooperation between different actors (e.g., industries, universities, citizens, and firms) provides an ideal model that integrates specialists from different areas, institutions, and development funds entities [A92]. This approach converts research and

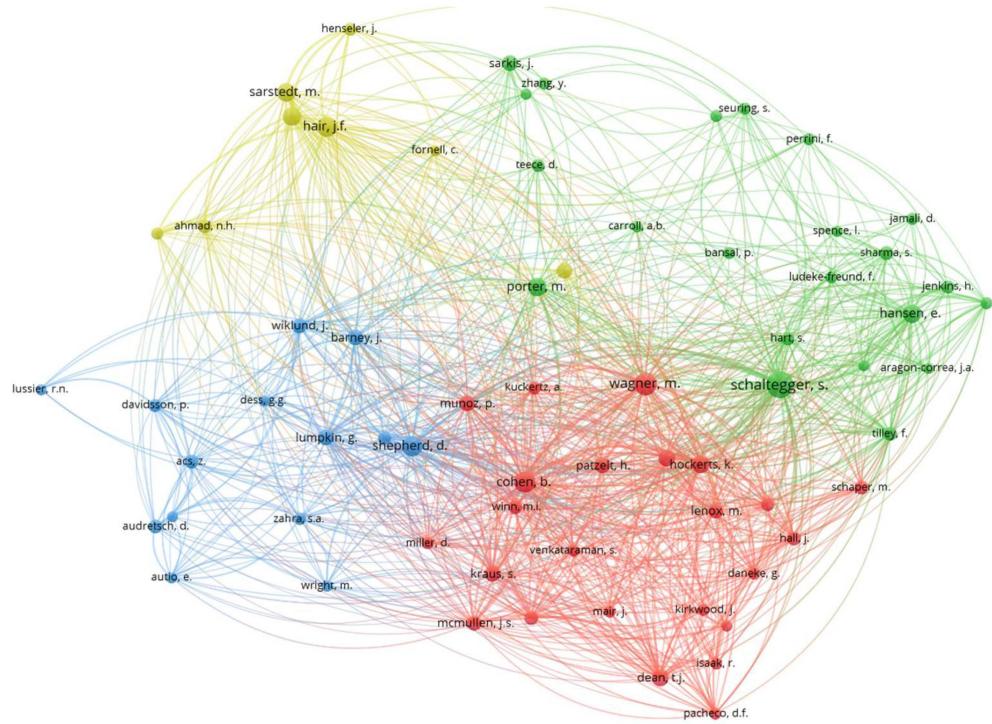


Fig. 9. Co-citation by author. Note. Minimum number of citations: 20.

creativity into innovative products, services, and solutions [A93]. Alliances and collaborative networks (i.e., multiple networks, cluster cooperations, and triple helix partnerships) are important to SMEs' success. Cooperation with other entities increases these companies' competitiveness, facilitates their transition to sustainability, stimulates innovation, expands their innovative capacity, and fosters SD [A69], [A85], [A94]–[A97].

Dynamic collaborations thus need to be stimulated between entrepreneurs and specialists embedded in local economic environments—often facilitated by incubators and technology parks [A84], [A92], [A98]. Partnerships can foster the development of different types of innovation (e.g., open and social) [A99], [A100], corporate sustainability, regional specialization, and new skills. In addition, cooperation promotes job creation, knowledge transfer, and top business practices, as well as ensuring resources' availability for projects [A86], [A101], [A102].

Some reasons for forming networks are extensive expertise, relationships with key external stakeholders, and support for business ideas and local economic development [A84], [A98], [A103]. However, networks can present difficulties, such as partners' conflicting goals, a short-term mindset, and unrealistic expectations. Regardless, researchers unanimously agree that cluster collaboration allows partners to share risks [A104].

4) Sustainable Business Models Cluster: The sustainable business models theme is covered by 31 studies. The studies in this cluster examined SME business models that focus on creating value and benefits for stakeholders based on long-term sustainability principles (i.e., the TBL: economic growth, social cohesion, and environmental protection). To develop sustainable business strategies, these firms should first analyze their

resources and dynamic capabilities [A105]–[A107]. With the information obtained, managers can then implement green marketing and eco-labelling practices to meet customers' expectations in terms of SMEs' role in the planet's future and people-friendly products and/or services. The goal is to promote a strong green image to achieve sustainable competitive advantage [A108].

Various authors in this cluster assert that the TBL model is missing a smart technological component and that a digital performance dimension must be added to this model for SMEs to achieve smart, sustainable growth [A109]. Other researchers argue that business models need to be more people-centered since these firms' interpersonal relationships are a fundamental component of a strategic sustainability orientation [A110], [A111]. Some scholars further contend that achieving sustainability requires a differentiation strategy (i.e., as opposed to cost leadership) [A112] and a responsible business model based on fair work and socioeconomic change [A113]–[A115].

The extant literature on sustainability tends to focus more on individual leadership competencies without considering all micro (i.e., individual), meso (i.e., firm), and macro (i.e., environmental) factors. Instead of using a top-down approach, sustainability business models have to be holistic, combining internal and external factors [A116] and dynamic and synergistic interactions at different levels [A117], [A118]. The main factors that influence these dynamic exchanges include top leadership's commitment to sustainability, resource and performance metrics, employees' skill acquisition, knowledge sharing, and efficient communication with different stakeholders. Additional determinants are clear, transparent mandates; a commitment to sustainability shared by collaborators; team members'

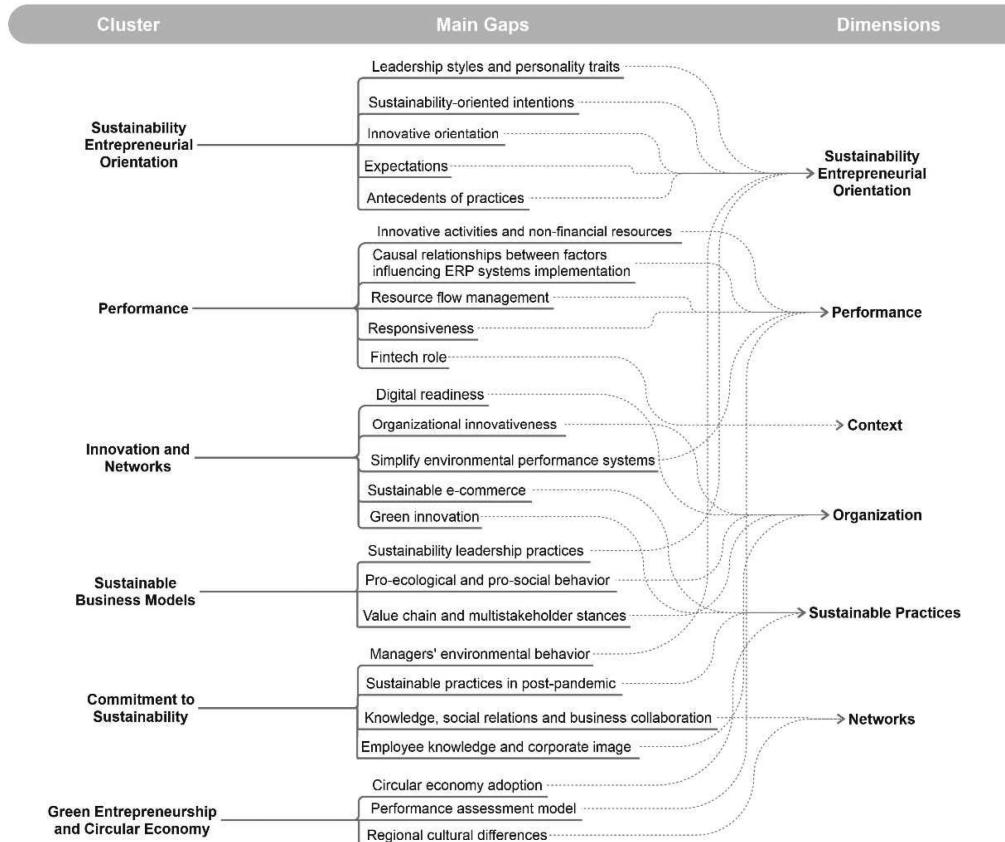


Fig. 10. SME SE themes by cluster. Note. ERP = enterprise resource planning.

empowerment; technological advances to solve specific problems; and governments working with markets versus regulating them [A117], [A119]–[A121].

Factors that challenge SMEs' sustainable business models are a lack of capital and financial resources (e.g., few private investors' support) and of knowledge about sustainability and SDGs. Other determining variables are legislation and government regulations (e.g., a mismatch between public policies and compliance with SDGs), capitalist economic pressures, an intensive consumer culture, inappropriate business models, and technologies' incompatibility with existing infrastructure [A106], [A111], [A116], [A122]–[A126]. Given these challenges, many SMEs deal with obstacles at various levels by applying sustainable livelihood business models, namely, operating on a scale reduced to match the available resources. This strategy implies making choices in line with both a commitment to sustainability and financial objectives [A127].

Some authors in this cluster (e.g., [A111], [A129], [A130]) argue that SMEs' sustainability can only be achieved by adopting new economic models, such as the blue, circular, and sharing economy paradigms. Circular economy facilitates the replacement of regular processes with natural, renewable ones (e.g., employing reusable resources in production) and maximizing materials and energy efficiency (e.g., reducing raw materials or transportation costs) [A124]. Business models based on the sharing economy help SMEs overcome their lack of resources,

find new business opportunities, and, ultimately, survive [A128], [A131]. Crucial factors in this context are cooperation with key partners (i.e., public and private entities), cocreation, and redistribution, which foster innovative solutions—especially those based on coproduction [A128], [A132], [A133]. Overall, information must flow between SMEs and citizens to enable the development of innovative products and services [A134], [A135].

5) *Commitment to Sustainability Cluster*: The commitment to sustainability theme is addressed by 51 documents. This cluster focuses on initiatives that reflect SMEs' commitment to sustainability principles (i.e., economic growth, social cohesion, and environmental protection) and SDGs. Various researchers observe that small firms tend to be less dedicated to sustainability due to their scarce resources and limited perception of sustainability's importance. The main drivers of SMEs' implementation of sustainability strategies include, among others, firms' internal motivations, perceived benefits in terms of product innovation and operational efficiency, and the ability to achieve differentiation and stand out from the competition [A136]–[A141]. SMEs' sustainability commitment varies according to whether they have a sustainability-oriented culture at two fundamental levels: leadership and organization.

These companies' leaders are extremely important because they guide the firm, project a sense of ethical and environmental responsibility, and serve as role models [A141]–[A147]. These

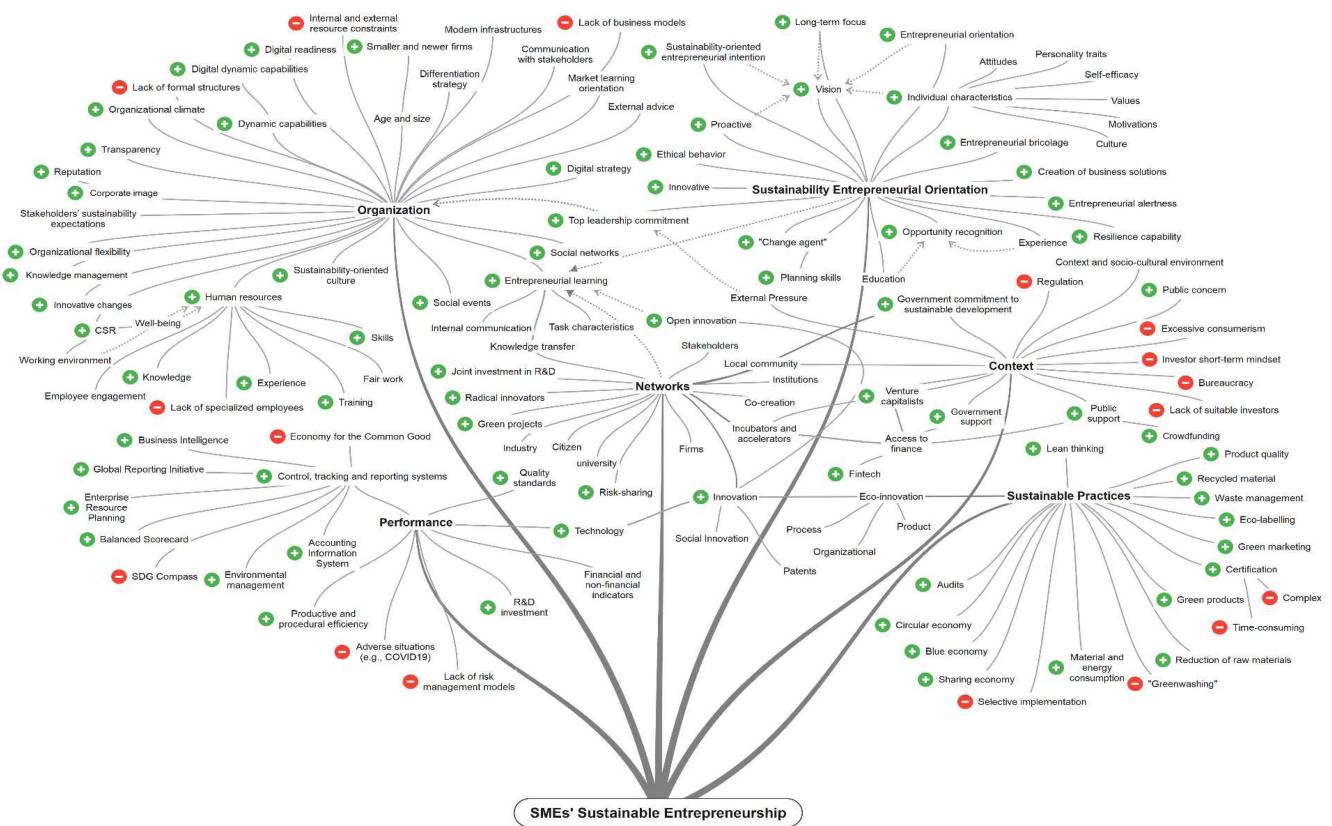


Fig. 11. Determinants and/or initiatives that drive and/or inhibit SE in SMEs. Note. CSR = corporate social responsibility; SDG = sustainable development goal; R&D = research and development; COVID-19 = coronavirus disease-19; SMEs = small and medium-sized enterprises.

individuals' values must be aligned with an open-minded, long-term vision of sustainability in order to create enduring results [A137], [A148]–[A152]. At the organization level, SMEs have to provide the conditions for employees to implement innovative measures contributing to sustainability. If firms set no specific strategic sustainability goals, this ideal will not become an organizational priority [A153]–[A156].

Multiple factors can influence stakeholders' adjustment of their expectations and SMEs' ability to adopt sustainable practices [A151], [A157]–[A160]. Firms tend to implement procedures with environmental benefits, and most companies are more concerned about social issues than financial ones [A156], [A161]–[A165]. SMEs' engagement in sustainability and pro-environmental behaviors thus depends on their organizational flexibility and on their relationships with individuals, local communities, and societies [A136], [A141], [A166]–[A171]. That is, these firms should seek to meet people's needs (e.g., employ and empower local people) [A172].

Initiatives can influence sustainable practices, for example, through information and knowledge sharing (i.e., cooperative relationships). Other influential projects are internal education programs and the presentation of success stories to educate and motivate employees (i.e., human capital development). SMEs' sustainability strategies are also stimulated by external advice, community projects, government funding (i.e., sustainable finance), and innovative changes [A157], [A166], [A173]—[A175].

Another important factor is external pressures from customers and other stakeholders to comply with environmental regulations, obtain appropriate certificates, and apply green methods and responsible practices [A136], [A143], [A146], [A155], [A166], [A176], [A177]. Although SMEs frequently engage in reactive behavior [A136], [A150], [A178], they are more motivated to change to sustainable practices when pressured to do so. These firms then become more eager to seek certifications that endorse their sustainable procedures.

Various negative factors can also influence SMEs' ability to adopt sustainable practices. For instance, these companies' decisions are affected by bureaucracy, limited financial and human resources, restricted knowledge about business-oriented environmental legislation, and resistance to environmental entrepreneurship [A179]–[A182]. SMEs are also sensitive to uncertainty about ecological measures' commercial benefits, which causes these firms to select strategies that reduce costs [A141], [A146], [A183] or improve their reputation [A146], [A155], [A159]. These determinants become even more significant in adverse situations (e.g., COVID-19) [A184], [A185].

Another barrier is the challenge of measuring environmental initiatives' impact on businesses' performance [A141] to demonstrate to investors how well sustainability strategies generate social value [A180]. Large firms are important role models that can discourage SMEs from engaging in sustainable practices due to corporations' contradictory actions and words and their manipulation of public opinion (i.e., greenwashing) [A159],

[A172]. Finally, a gap exists between SDGs' relevance on a global scale and their transfer to a national scale [A159], [A172], [A186], which hinders SMEs' engagement in sustainable initiatives in diverse business sectors.

6) Green Entrepreneurship and Circular Economy Cluster: This theme is the smallest as it involves only 20 publications. This cluster focuses on the environmental aspects of sustainability, namely, SMEs' green entrepreneurship and circular economy practices (i.e., SE). Researchers have analyzed circular economy's impact on these companies' sustainable performance [A187]–[A189]. Some scholars argue that circularity in production processes enables firms to reduce their production costs [A190]. Other studies have found that government support and customer pressure facilitate the adoption of circular economy practices and related technologies [A188], which improves innovation and performance.

In addition, financial success is also significantly influenced by optimizing waste management and using renewable energy and recycled materials [A189]. The search for better financial performance is thus a decisive factor in SMEs' adoption of circular economy practices, especially in the manufacturing, retail, and industry sectors. This process is complemented by investment in R&D [A191].

Various terms are related to green entrepreneurship (i.e., entrepreneurship, eco-entrepreneurship, and green-green business), which all refer to "*entrepreneurship through an environmental lens*" [A192, p. 47]. Green entrepreneurship pushes SMEs to identify technologies and methods that reduce existing business practices' negative effects and promote productive and efficient procedures with minimal impacts on natural resources via eco-innovation and green products [A193], [A194]. These inventions allow SMEs to grow, meet stakeholders' expectations (e.g., employees, suppliers, and investors), and strengthen their competitiveness in ever-changing markets [A195], [A196]. Eco-innovation thus facilitates the development of new products that meet customers' needs and create business value along with positive social impacts.

SMEs are distinguished by informal management, and they strongly depend on their owners' leadership and ethical motivations [A197]. Decision making is based on the founders' values [A198]. External and internal factors that influence green entrepreneurship comprise government support, unstable legislation, bureaucracy, up-to-date infrastructure, sustainability-oriented entrepreneurial culture, talent management, and technology. Other determinants are companies' use of environmental management systems, competitiveness, and innovative operating procedures as these variables foster effective functioning and growth [A192], [A198]–[A200].

Green entrepreneurs' greatest challenges are balancing the trade-offs between economic, environmental, and social aspects and developing a financially viable business while prioritizing environmental and social ideals [A197], [A201]. SMEs also must match clients with entrepreneurial projects compatible with the green market and concurrently raise consumers' awareness of green products' distinct advantages in terms of price, quality, and environmental impact [A201]–[A203].

Green entrepreneurship is associated with heavy investments, but this strategy ultimately has a positive impact on SMEs' financial performance [A204]. Green innovation implies large outlays that increase these companies' already substantial financial burden. This tactic is, however, an opportunity to improve performance as it converts inadequate resources into advantages by redesigning products or processes to increase efficiency [A205].

In addition, green innovation can also improve firms' image and reputation, thereby attracting consumers who are more sensitive to environmental issues. SMEs' green image is also strengthened if, besides using eco-friendly products, these companies acquire environmental certification, develop affiliations with environmental organizations, and conduct public relations campaigns with green themes. Company image is further enhanced when employees perceive a green organizational identity and develop green core competencies [A202], [A206].

D. Co-citation

The next step was to identify the most cocited authors by grouping the 68 authors with a minimum of 20 citations into four clusters (see Fig. 9). S. Schaltegger is the most prominent researcher with 110 citations, followed by M. Wagner with 76, B. Cohen with 71, J. Hair with 64, D. Shepherd with 63, and M. Porter with 57.

Fig. 9 shows Schaltegger and Porter together in the green cluster. This group comprises scholars who contribute to the strategic management field, specifically addressing topics related to business strategy, environmental management, and sustainable business models. Wagner and Cohen, in turn, stand out in the red cluster, which is related to the literature on sustainability orientation, innovativeness and entrepreneurial intentions, corporate sustainability, and market imperfections and opportunities. Hair dominates the blue cluster, which is composed of authors who use quantitative research methods, namely, PLS-SEM and multivariate analysis. The blue cluster is led by Shepherd and is related to SE and small business performance, firm resources, sustainable competitive advantages, and strategic decision making.

IV. RESEARCH AGENDA

This SLR also examined the main research gaps in previous SE-related studies focused on SMEs. An integrative data analysis was conducted that focused on SE in SMEs and the most significant issues in this field. The results delineate the lines for future research presented by cluster in Table I. The largest gap found in all the clusters is the scarcity of studies analyzing causal relationships between determinants and sustainable practices' implementation. This lacuna is also mentioned in the extant literature (e.g., [A5], [A40], [A152], [A181], [A192]).

Fig. 10 presents the themes identified based on the key ideas in each cluster and related research gaps. The main features that inhibit and/or drive SE in SMEs are as follows: sustainable entrepreneurial orientation, organization, performance, networks, contexts, and sustainable practices.

TABLE I
FUTURE LINES OF RESEARCH BY CLUSTER

Cluster	Main Gap
Sustainable Entrepreneurial Orientation	Insufficient information regarding leadership styles' (<i>i.e.</i> , transformational, distributed, and ethical) role in the relationship between personality traits and sustainability-oriented entrepreneurial intentions.
	Lack of findings on how leadership styles, cultural differences, or research and development (R&D) readiness drive small and medium-sized enterprises (SMEs) to adopt sustainable entrepreneurial practices.
	Need for studies of innovative orientation's influence on business growth expectations regarding process, product, marketing, and organizational innovation.
	More research required to understand the antecedents of practices adopted by owners and/or managers (<i>e.g.</i> , training programs) to ensure a sustainable entrepreneurial orientation.
	Few analytical and comparative studies of entrepreneurs and investors' expectations related to environmental, social, and economic business dimensions.
Performance	Lack of information on innovative entrepreneurial activities and non-financial resources' effect on the relationship between financing and SDGs.
	Insufficient empirical research on how digital and virtual technologies supporting resource flow management along the supply chain affect SME performance.
	Little known about causal relationships between factors influencing the implementation of enterprise resource planning (ERP) systems (<i>e.g.</i> , financial support, top management support, and external pressures) to strengthen SMEs' sustainability.
	More qualitative studies needed of fintech experts' role in SDG implementation by SMEs.
	Additional investigations required to clarify management commitment's mediation of the relationship between green entrepreneurial orientation and sustainable performance.
Innovation and Networks	More empirical research needed on how SMEs can optimize their responsiveness to stakeholders' expectations regarding sustainability without compromising revenues.
	Additional empirical research required on the connections between digital readiness, knowledge transfer, and business performance
	Comparative studies needed of organizational innovativeness in different types of SMEs (<i>e.g.</i> , start-up, well-established, and high-tech)
	Need for simplified versions of complex environmental performance methods and systems that can be adapted to fit SMEs' realities
	More information required on barriers to sustainable e-commerce, with attention paid to internal (<i>e.g.</i> , management support or financial position) and external (<i>e.g.</i> , pressures from different stakeholders) factors
Sustainable Business Models	Little empirical research focused on understanding entrepreneurial propensities that motivate Generations Y and Z to adopt green innovation based on sustainable practices
	Insufficient information available on sustainability leadership practices in emerging and developed countries
	More studies needed of the factors that induce firms to engage in pro-ecological and pro-social behaviors
	Theoretical models required that integrate diverse ways to implement SDGs in SMEs, including value chain and multistakeholder approaches
	Exploratory research needed of SME managers' environmental behavior in different sectors of activity and/or nations
Commitment to Sustainability	Additional studies required of how SME owners perceive sustainability practices after the recent pandemic and whether these individuals' commitment to sustainability has changed
	More empirical research needed on the role of knowledge, social relationships, and business collaboration in the link between family firms and green business practices
	Insufficient information available on how competitive advantages related to incentives, employee knowledge, and corporate image affect SMEs' sustainable behavior
	Additional investigations required to identify the main obstacles to adopting a circular economy and evaluating innovative business models on multiple levels
	Performance assessment models needed that include measures of green entrepreneurial activities (<i>e.g.</i> , energy-saving or eco-friendly materials)
Green Entrepreneurship and Circular Economy	Insufficient information available on regional cultural differences' impact on ecopreneurship and SMEs' environmental practices

According to Fig. 10, practitioners and policymakers can use these insights to develop leadership commitment to sustainability within SMEs. This includes facilitating collaboration, raising awareness, and advocating for supportive policies. Embracing innovation and technology is also crucial for driving sustainable entrepreneurship in SMEs. By implementing these strategies, practitioners can empower SMEs to integrate sustainability into their operations and contribute to a more sustainable future.

After the above dimensions and gaps were defined, a final theoretical framework was developed (see Fig. 11). SimpleMind Pro software (see www.simplemind.eu) was used to structure the determinants and/or initiatives that drive and/or inhibit SE in SMEs. Each theme includes various factors that have a positive (*i.e.*, plus sign) or negative (*i.e.*, minus sign) impact on SE.

All the dimensions are important and incorporate various factors. More specifically, the following determinants facilitate SE

in SMEs: top leadership's commitment to sustainability, proactive mindsets and long-term visions, opportunity recognition, sustainability-oriented culture, and eco-innovation. In contrast, the factors that hinder SE in SMEs are internal and external resource constraints, few or no specialized employees, bureaucracy, unsuitable investors, and the selective implementation of sustainable practices. The variables included in the final theoretical framework address the third predefined research question.

V. CONCLUSION

Over the past three decades, SE in SMEs has increasingly attracted academicians and entrepreneurs' interest. This SLR confirmed an evolution toward more publications on this topic per year from 1987 to 2022, with an especially large volume in the 2020–2022 period. This growing area of research has partly been stimulated by SMEs' unique contexts, which influence their commitment to SE (cf. [14], [15], [16]) in the economic, environmental, and social dimensions.

The present study conducted bibliometric analyses of SE-related research focused on SMEs. By combining co-citation and bibliographic coupling, this SLR produced significant insights regarding the most prominent scholars in the field and identified new avenues future studies can follow. Of the previous SLRs on SE, only one focused on SMEs, leaving five major gaps that this research sought to fill.

The first lacuna was bridged by carrying out an updated temporal analysis, while the second involved mapping SE in SMEs using different bibliometric approaches, namely, co-citation and bibliographic coupling. The third gap was filled by exploring SE in SME-related studies, with explicit attention paid to the TBL dimensions (i.e., social, economic, and environmental). The fourth was addressed by exploring SMEs' capabilities, competencies, and unique advantages regarding sustainable practices, and the last gap was filled by identifying possible determinants or initiatives affecting SE in SMEs. In addition, the connections between thematic groups were examined to provide a better understanding of the links between factors influencing SE in SMEs and a starting point for researchers and practitioners planning investigations in this field.

The citation and co-citation analyses' results show that the most influential studies include Bocken [49], D'Amato et al. [50], Klewitz and Hansen [12], Spence et al. [51], and Xia et al. [52]. In addition, the top-five authors with the highest amount of co-citation are, by order of decreasing volume, S. Schaltegger, M. Wagner, B. Cohen, J. Hair, D. Shepherd, and M. Porter. The methodologies used by most researchers are qualitative techniques—mostly case studies and interviews—and quantitative methods—primarily regression, PLS-SEM, and SEM. These findings answered the first research question: What methodologies have been used to analyze SE in SMEs?

The bibliometric coupling analysis summarized the connections between the most fundamental studies of SE in SMEs. The results reveal six major clusters based on coupling strength: *sustainable entrepreneurial orientation, performance, innovation and networks, sustainable business models, commitment to sustainability, and green entrepreneurship and circular economy*.

These findings addressed the second research question: What are the main thematic clusters of SE-related publications focused on SMEs? The main gaps were then identified in the literature, and suggestions for future research were then formulated for all the clusters.

The main dimensions that inhibit and/or drive SE in SMEs were identified as part of the cluster analysis, namely, sustainable entrepreneurial orientation, organization, performance, networks, contexts, and sustainable practices. These dimensions' factors were then defined to answer the third research question: What determinants and/or initiatives drive and/or inhibit SE in SMEs? Among others, the following factors facilitate SE in SMEs: top leadership's commitment to sustainability, proactive mindsets and long-term visions, opportunity recognition, sustainability-oriented culture, and eco-innovation. Some of the variables that hinder SE in SMEs are internal and external resource constraints, few or no specialized employees, bureaucracy, unsuitable investors, and selective implementations of sustainable practices.

While we delve deeper into the drivers and inhibitors of SE in SMEs, we aim to bridge the gap between research and practice by generating insights that can inform and guide practitioners and policymakers in their pursuit of sustainable business practices. First, these players should prioritize developing and nurturing leadership commitment to sustainability within SMEs, by promoting a clear vision for SE and ensuring that leaders are actively involved in driving sustainability. Second, they should play an active role in providing SMEs with access to funding opportunities, grants, and incentives that specifically target sustainable initiatives. Third, they can offer guidance and expertise through training programs, workshops, and networking events to help SMEs acquire the necessary knowledge and skills for implementing sustainable practices. Fourth, practitioners and policymakers should encourage collaboration and knowledge-sharing among SMEs, industry associations, and other relevant stakeholders. By fostering collaboration, they can create a supportive environment where SMEs can learn from each other and jointly address sustainability challenges. Fifth, they can actively advocate for supportive policies and regulations, and educate stakeholders about the benefits of SE in SMEs. By advocating for a favorable regulatory environment, they can overcome barriers and create incentives for SMEs to adopt sustainable initiatives. By effectively communicating the value proposition of SE, practitioners can create a positive perception and generate support from customers, suppliers, investors, and the wider community. Finally, they should encourage SMEs to embrace innovation and leverage technology to drive SE. This can involve exploring new business models, adopting sustainable technologies, and promoting eco-innovation. By embracing innovation and technology, SMEs can improve their efficiency, reduce environmental impacts, and create new market opportunities. Overall, by implementing these strategies, practitioners can empower SMEs to integrate sustainability into their core business operations and contribute to a more sustainable future.

This SLR maps the evolution of research on SE in SME contexts, but the study was subject to specific limitations. Only one database (i.e., Scopus) was searched, so all the relevant

issues and areas may not have been covered. In addition, reports, conference proceedings, and books were excluded from the analyses to ensure a homogeneous sample, and the research field categories were limited to business, management, and economics. Further investigations are needed to examine other categories in order to complement the above results.

In future SLRs, scholars could add more recently published articles and other publications to the literature reviewed, such as conference proceedings, reports, and/or books. Future studies could further explore the relationship between authors/journals and the different methods applied. Studies should also concentrate on deepening the six areas of research identified by this SLR: *sustainable entrepreneurial orientation, performance, innovation and networks, sustainable business models, commitment to sustainability, and green entrepreneurship and circular economy*. Any further findings on these topics will be welcome additions to the existing knowledge about SE in SME contexts.

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