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Implementing sustainability: What role do knowledge management and management accounting play? Agenda for environmentally friendly businesses

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Abstract

The present article investigates the literary corpus on knowledge management (KM), management accounting and control (MAC) systems, and sustainability implementation. The adopted method is a systematic literature review (SLR) analysis on articles listed on Scopus and Web of Science (WoS). The authors followed a rigorous research protocol that led to a final sample composed of 61 academic articles. This body of work: (i) profiles the selected articles underscoring journals productivity, geographical scope, methodological approach, and the most cited manuscripts; (ii) identifies and classifies the six main thematic clusters detailed as: corporate social responsibility, sustainability reporting, sustainable supply chain management, human resource management, green innovation, and universities as knowledge rich organizations; (iii) allows for the proposition of a conceptual framework; and (iv) helps establish existing research gaps. The present body of work carries both theoretical and practical implications, as well as limitations associated with its methodological approach and scope.

KEYWORDS
knowledge management, management accounting, management control systems, sustainability, systematic literature review

1 | INTRODUCTION

Knowledge management (KM) practices are of paramount importance for businesses seeking to tackle sustainability issues, as the pursuit of sustainable development has deeply impacted both public and private organizations (Ul-Durar et al., 2023). Indeed, climate change, pollutants, global warming, and natural resource degradation are recognized by governments, businesses, and other entities as pressing issues that must be addressed to ensure future prosperity (Mirón et al., 2023; Zhou & Zhang, 2018). To combat these challenges, businesses are

employing a variety of methods, techniques, and tools to reduce their environmental impact and respond to the growing interest of governments and consumers in environmental concerns (Mukhtar et al., 2023; Zhou & Zhang, 2018). They aim to comply with policies and regulations set by legislative institutions (Asiaei et al., 2022) and potentially obtain a green competitive advantage (Wei et al., 2023). Hence, dynamic firms seek to implement strategies and systems aimed at safeguarding nature and the environment by consciously fostering their ecological performance (Ullah et al., 2022; Wei et al., 2023; Zhou & Zhang, 2018). Nearly every sector has

implemented principles and systems aimed at improving their responsible behaviors, efficiency and eco-management due to the United Nations' sustainable development goals (SDGs) (United Nations, 2023). However, the United Nations are not the only entity taking action to fight environmental and natural resources degradation. For example, the European Union (EU) has developed the EU Green Deal, which seeks to promote companies' commitment toward greener practices (European Commission, 2023). Additionally, various authors in the academic literature highlight the increased regulatory demands and the interest of various stakeholders, such as shareholders, suppliers, workers, and consumers, in a company's environmental contributions, thus underscoring both the practical and theoretical importance of investigating sustainability issues (Shahzad et al., 2021; Tapaninaho & Heikkinen, 2022). Henceforth, companies are incentivized to mitigate their environmental impact through measures and reports whose aim is to address the modern issue of environmental degradation (Arvidsson & Dumay, 2022; Erin et al., 2022). Businesses have experimented with numerous systems; thus, establishing a holistic connection between environmental concerns and management control (Deb et al., 2023). It is increasingly recognized that businesses' operational procedures can potentially impact the environmental system adversely (Sahoo et al., 2023). Therefore, management accounting systems are increasingly necessary to consider firms' operational procedures regarding financial, managerial, and environmental performance (Deb et al., 2023). Scholarly literature underscores the need for future research to deepen our current understanding of environmental management accounting and environmental performance since the above mentioned topics carry both practical and theoretical implications (Deb et al., 2023; Liu et al., 2018; Mayndarto & Murwaningsari, 2021).

Management accounting and control (MAC) focuses on providing the necessary information for managerial decision-making while also seeking to align employee behaviors with the organization's interests (Endenich & Trapp, 2020; Malmi and Brown, 2008). Therefore, their continuous interaction with top managers and overall influence on managerial decisions underline the substantial role management accountants play in environmental performance (Endenich & Trapp, 2020). In fact, management accountants are responsible for numerous processes, including cost accounting, budgeting, reporting, and management control systems (Maas & Matêjka, 2009). Their responsibilities also encompass various strategic aspects of the business, such as environmental and social sustainability. Indeed, management control systems help integrate environmental and social sustainability into organizational strategy, supporting businesses in understanding how environmental and social changes and challenges may affect them (Bebbington & Thomson, 2013). Additionally, integrating sustainability and strategy with the help of management control systems allows organizations to incorporate stakeholder requests into planning and reporting. This enhances accountability and increases awareness among managers and employees, leading to improvements at operational, commercial, and strategic levels (Contrafatto, 2014). However, incorporating sustainability into an organization's strategy is difficult because it requires the use of and the alignment of technical, organizational, and cognitive aspects

(Battaglia et al., 2016; Gond et al., 2012). Among the cognitive aspects, KM is a crucial issue. As a matter of fact, in the context of organizations and management control, KM has become an essential driver of organizational performance (Bresciani et al., 2023). KM can be understood as collective, individual or conceptual constructions, as well as from a normative point of view (Bresciani et al., 2023). From the normative perspective, knowledge is originated and expressed through various artifacts, databases, and text (Schwarz et al., 2003). Thus, knowledge can exist in various forms, models, and reports and it is an essential resource, as scholars believe we operate in a knowledge society. Therefore, organizations must create, process, and manage knowledge effectively if they seek to withstand dynamic changes (Bresciani et al., 2023) as those posed by climate change, global warming, and environmental degradation (Endenich & Trapp, 2020). For that reason, KM is strategically essential for organizations, and due to the limited scholarly literature, there is a need to further explore the links and conceptual boundaries between KM and environmental MAC systems (Bresciani et al., 2023; Jafari-Sadeghi et al., 2022). Indeed, MAC provides the necessary knowledge and information needed to assess, evaluate, and establish potential measures aimed at enhancing a firm's environmental performance (Harrer & Owen, 2022; Johnstone, 2020). Therefore, studying how informal elements, such as KM, influence the integration of MAC and sustainability is highly relevant (Battaglia et al., 2016). Fundamentally, the aforementioned strategic importance of KM and MAC, along with the current focus on sustainability matters, underscores the academic and practical significance of conducting research in this context.

The literature analysis (Bresciani et al., 2023; Chopra et al., 2021) highlights the demand to advance new research focusing on the established topic of KM, MAC, and sustainability thus corroborating the need to systematize the currently fragmented literature strand on MAC, KM, and sustainability. Indeed, despite the aforementioned interconnectedness between MAC, KM, and sustainability, scholarly literature often addresses these issues in isolation, failing to appropriately intersect them despite their undeniable interconnectedness. In fact, scholarly literature tends to focus on MAC and notions of sustainability without adequately discussing KM aspects (Nkundabanyanga et al., 2021). Similarly, some literature concentrates on KM and environmental aspects without integrating MAC (Abbas & Sagsan, 2019). Henceforth, it is necessary to systematize the current empirical findings concerning MAC, environmental, and social sustainability and KM as suggested by Bresciani et al. (2023) and Chopra et al. (2021). Recent academic literature fails to tackle the abovementioned topics and their association and interconnectedness despite their theoretical and practical importance, thereby underscoring the need for academics to thoroughly investigate the above mentioned notions and their interplay (Bresciani et al., 2023; Chopra et al., 2021). Specifically, Battaglia et al. (2016), Bresciani et al. (2023), Chopra et al. (2021), and Nkundabanyanga et al. (2021) observe that the relationship between MAC, KM, and sustainability remains overlooked, thus stressing the necessity and importance for scholars to systematically review the current body of knowledge concerning MAC, KM, and sustainability.
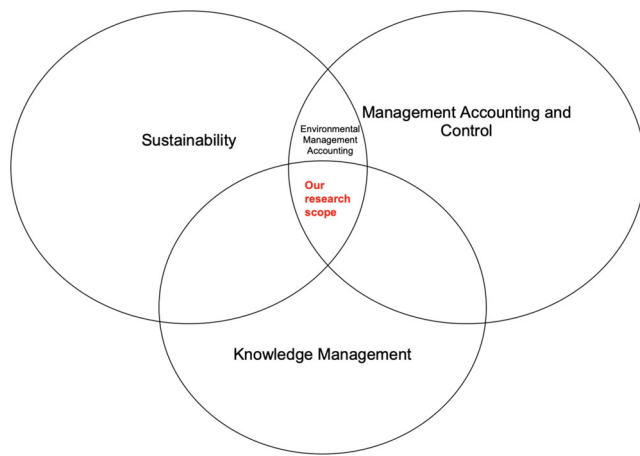
FIGURE 1 Graphical representation of the present study scope and investigation of the literature at the intersection of management accounting and control, knowledge management, and sustainability.

Certainly, better frameworks for addressing environmental concerns and performance evaluation need to be developed (Battaglia et al., 2016; Chopra et al., 2021) because they are crucial in understanding how MAC and KM affect green and social projects and activities. This should help clarify how the interplay between MAC and KM can contribute to an environmentally sustainable future. Furthermore, scholars emphasize the necessity of designing additional models and tools for evaluating KM within real-life sustainability projects (Martins et al., 2019).

Fundamentally, as previously detailed, the present body of research seeks to address the research gap concerning the lack of systematization of articles tackling KM, MAC, and sustainability, while also addressing the need for better conceptual theoretical frameworks.

Considering the previously discussed research gaps and limitations, the present study seeks to delve into the literature at the intersection of MAC, KM, and environmental and social sustainability (as graphically shown in Figure 1 below) to provide a detailed analysis of its key themes. Moreover, in response to Martins et al. (2019), the authors develop a conceptual framework established through the analysis of the empirical bodies of literature tackling MCA, KM, and environmental and social sustainability.

To fulfill the foregoing objectives and research gaps, the authors of the paper have developed the following research questions (RQs):

RQ1. What is the research profile of prior literature concerning MAC, KM, and environmental and social sustainability?

RQ2. What are the pressing key themes at the intersection of MAC, KM, and sustainability?

RQ3. What emerging issues are a promising agenda for future research concerning KM, MAC, and sustainability?

To answer the identified research questions, the authors of the paper have employed a systematic literature review (SLR)

methodology. The inquiry made within this SLR underlines the themes and research gaps associated with KM, MAC, and sustainability. Moreover, thanks to the extensive analysis conducted on the three foregoing notions, the authors were able to develop a theoretical conceptual framework, which provides useful inferences for both practitioners and scholars. Furthermore, this manuscript carries practical and theoretical contributions. First, the manuscript responds to RQ1 by profiling the current body of research tackling the notions of MAC, KM, and environmental and social sustainability. Second, this article responds to RQ2 by systematically identifying, reviewing, and analyzing the main themes associated with KM, MAC, and sustainability. It also sheds light on emerging trends and uncovers their conceptual contributions. Third, this manuscript addresses RQ3 by highlighting and proposing new avenues to further expand the literature on KM, MAC, and sustainability. Fourth, this manuscript develops a conceptual theoretical framework to help practitioners and scholars understand the intersection of KM and MAC and their contribution to companies' sustainability. It also addresses the request by Chopra et al. (2021) and Battaglia et al. (2016) for formulating a conceptual theoretical framework to tackle issues related to KM, MAC, and sustainability. Finally, this manuscript informs managers, CEOs, CFOs, and other managerial professionals about the impact KM systems can have on companies' management control systems, green performance, and sustainability strategies.

The review is structured as follows. First, this article delineates the scope and methodological approach employed for conducting the review. Second, it profiles the obtained sample. Third, in an attempt to unbundle the literature at the intersection of sustainability, KM, and MAC, this paper identifies the major and key themes present within the selected literature. Fourth, the study presents and develops future research avenues to guide researchers toward deepening our current understanding of KM, MAC, and sustainability intersection.

2 | SCOPE OF THE REVIEW

It is crucial for SLR to clearly establish their scope and periphery. In doing so, the authors can develop a research protocol which builds a comprehensive database of studies which focus on the notions of MAC, KM, and sustainability. Additionally, by clearly defining the scope and periphery of this literature review, the authors are able to clearly establish the inclusion and exclusion criteria. The authors deemed relevant to select peer-reviewed articles published within the selected domains up until October 2023.

Scholarly literature generally defines KM as the acquisition, assimilation, transformation, utilization, and creation of an organization's collective knowledge assets (Caloghirou et al., 2004). The availability of information and KM is closely related with firms' ability to achieve a competitive advantage (Adams & Lamont, 2003). Therefore, it is crucial for organizations to share knowledge in an attempt to progress and satisfy stakeholders needs (Tamer Cavusgil et al., 2003). Corporations exploit internal and absorb external knowledge to establish dynamic strategies (Caloghirou et al., 2004). Henceforth,

corporations encourage continuous development and analysis of their positioning and strategy by recombining existing knowledge (Yi et al., 2021). KM systems grant the opportunity to exploit data and information to better process management and performance (Bresciani et al., 2023; Yi et al., 2021). The stratification of knowledge gathered and managed through KM systems favors the combination of old and new knowledge and data, nurturing innovative approaches aimed at promoting companies' performance, not limited to the traditional measures and areas of concern of MAC (Chen et al., 2022; Di Vaio et al., 2021). In fact, KM systems can help firms allocate resources to the development of MAC whose target is promoting companies' environmental performance (Di Vaio et al., 2021; Xu et al., 2023). Consequently, KM can significantly impact MAC, influence companies' business models, enhance communication across various business units, and promote strategic alignment. It can deeply challenge a corporation's strategic approach and capabilities, as well as affect how organizations allocate and utilize resources (Di Vaio et al., 2021; Saura et al., 2023; Xu et al., 2023).

MAC has undertaken the direction of safeguarding the natural environment and its resources; thus, expanding its initial focus on cost, performance and decision making (Bresciani et al., 2023). Today's management control systems must manage the risks associated with environmental degradation by monitoring companies' environmental costs and performance (Bresciani et al., 2023; Burritt & Saka, 2006; Christ & Burritt, 2015; Schaltegger et al., 2022). Consequently, management control systems are rapidly gaining traction and attention within both practice and academia because of their contribution toward achieving a sustainable future (Bresciani et al., 2023). MAC systems must share and manage knowledge within organizations to facilitate corporations' pursuit of environmental, as well as, operational and financial performance enhancements (Deb et al., 2023; Ferreira er at, 2010; Magnacca & Giannetti, 2023). Through MAC, organizations are forced to manage and share their intel and knowledge to nurture valuable discussions surrounding their environmental performance (Hsiao et al., 2022; Magnacca & Giannetti, 2023; Qian et al., 2018). Henceforth, KM strategies and systems are closely connected with the KM notion, as MAC requires the management of information to enhance companies' environmental, financial, and operational efficiency (Bresciani et al., 2023; Camilleri, 2022; Latan et al., 2018).

After establishing the conceptual boundaries (notions of KM, MAC, and sustainability), the authors developed a research string composed of keywords to be employed within the Scopus and WoS electronic database search. The authors utilized the Scopus and WoS databases because they list the most relevant academic journals and publications. The terminology employed uses various dimensions and aspects of MAC, KM, and sustainability due to their conceptual nature. Initially, the authors conducted a preliminary search of studies listed on Google Scholar to identify a first set of keywords that could be helpful in fetching relevant results at the intersection of MAC, KM, and sustainability. Thereafter, the authors brainstormed to establish potentially missing keywords. To uphold the scholarly standard normally recognized with academic literature, only articles published on journal articles were taken into consideration since they most likely had to undergo a rigorous peer-review process (Kaliannan et al., 2023). Conversely, book chapters, essays, reports, conference proceedings were excluded. The authors address the call for research from an interdisciplinary management perspective, employing popular electronic databases. Additionally, the authors conducted backward and forward searches to ensure that all relevant publications were taken into consideration.

3 | RESEARCH FRAMEWORK AND METHOD

This manuscript employs a SLR approach thus following the methodological steps proposed by Tranfield et al. (2003).

When adopting a SLR method to conduct research, several benefits can be achieved. First, it offers a rigorous and replicable method (Engert et al., 2016; Jäger-Roschko & Petersen, 2022; Kushwah et al., 2019). Second, it facilitates a systematic synthesis and analysis of aggregate themes and knowledge (Behera et al., 2019; Chaudhary et al., 2022; Dhir et al., 2021; Sengers et al., 2019). This is especially useful when there is a need to discern the principal discoveries within a convoluted, disjointed and expanding literature (Sengers et al., 2019). Furthermore, SLR forces researchers to strategically plan the search of relevant publications (Chaudhary et al., 2022; Di Vaio et al., 2021).

The recommendations put forward by Tranfield et al. (2003) and Creswell (2021) were adhered to, emphasizing the need of meticulous preparation, implementation, and documentation in conducting SRL research. In accordance with the recommendations advanced by Bettany-Saltikov (2016), Fisch and Block (2018), Engert et al. (2016), and Mauro et al. (2018), our study adhered to a seven-stage process. The key steps involved in this study include: (i) formulation of RQs, (ii) selection of appropriate databases; (iii) identification of relevant search terms; (iv) execution of database searches; (v) elimination of duplicate and loosely related articles; (vi) application of exclusion and inclusion criteria; and (vii) data analysis (Broccardo et al., 2023).

As previously underlined, the first step (i), the formulation of research questions, is evidenced within Section 1 of this article, in which the authors identify the research gaps. As a result, the authors develop the RQs for this manuscript. The following steps of the seven-stage process are described in the following Sections 3.1–3.3.

3.1 | Database selection and search terms identification

This SLR aims to analyze and comprehensively understand the existing scholarly body of literature concerning the intersection of MAC, sustainability, and KM literature. To achieve the stated goal, the researchers utilize two main databases: Scopus and Web of Science (WoS). Additionally, the authors use the Google Scholar search engine to further supplement their data by engaging in citation chaining (Secundo et al., 2020; Waltman, 2016). The present study focuses on MAC and, therefore, excludes domains, which are not strictly related to it.

Initially, the authors established a few keywords through the exploration of previous scholarly publications to conduct a preliminary database search and identify publications that fall within the scope and aim of this study. Hence more, the authors employed the foreboding keywords to conduct an initial preliminary research on the Google Scholar engine to assess its first 10 pages of results and, consequently, update the keywords list if deemed necessary. Thereafter, the authors assessed leading accounting and management journals separately to ensure no relevant keywords were being excluded. Table 1 contains this SLR's final keywords and research string.

3.2 | Exclusion criteria and data analysis

The present section highlights the inclusion and exclusion criteria as shown in Table 2. The definition of the foregoing criteria helps researchers refine the obtained results. This SLR includes journal articles and excludes book chapters, conference proceedings, reports, surveys, and other sources, as these might not undergo a rigorous peer review process for publication (Kaliannan et al., 2023).

3.3 | Database execution and elimination of duplicate

The keywords indicated in this manuscript Section 3.1 were converted into a research string through the utilization of "OR" and "AND" connectors along the application of * following Boolean logic. The developed string was employed to scrutinize titles, abstracts, and keywords of publications listed on WoS and Scopus databases. The authors then made sure to remove the duplicate articles across databases. Publications taken into consideration were articles published up until October 2023. Figure 2 depicts the SLR various steps in detail. Based on the previously established research aim, scope, predesign conceptual boundaries and screening criteria, the authors separately analyzed titles, abstract, and keywords to conduct the screening process and eliminate articles that failed to align with the manuscript research boundaries. The articles which passed the foregoing screening process were then assessed in their entirety through a full text analysis to ensure their content would fit within this SLR. Finally, the authors employed Google Scholar to conduct a citation chaining test to ensure that all relevant articles were included in this SLR.

In summary, a total of 2163 publications were identified using the research string presented in Table 1. Subsequently, 1400 publications,

TABLE 1 Final keywords and research string for the literature search.

Management control-related keywords	Sustainability-related keywords	Knowledge management related keywords	Search string
Management accounting	Sustainability	Knowledge management	"manage* account*" OR "manage* control*" OR "control* system" OR "organiz* control*" AND "sustainab*" OR "green*" OR "environment*" OR "ethic*" OR "social*" OR responsib*" OR "triple bottom line" AND "knowledge manag*" OR "knowledge-bas* system*" OR "knowledge creat*" OR "knowledge applicat*" OR "knowledge shar*" OR "knwoledge transfer*" OR "knowledge protect*" OR "knowledge theft*" OR "knowledge storag*" OR "enterprise knowledge manag*" OR "knowledge disseminat*" OR "knowledge evaluat*" OR "organiz* knowldge" OR "explicit* knowledge" OR "tacit* knowledge"
Management control	Green	Knowledge management systems	
Control system	Environmental	Knowledge based systems	
Organizational control	Ethical	Knowledge management strategy	
	Social	Knowledge management activities	
	Responsible	Knowledge management capabilities	
	Triple bottom line	Knowledge creation	
		Knowledge acquisition	
		Knowledge application	
		Knowledge sharing	
		Knowledge transfer	
		Knowledge protection	
		Knowledge theft	
		Knowledge storage	
		Enterprise knowledge management	
		Knowledge dissemination	
		Knowledge evaluation	
		Knowledge exchange	
		Organizational knowledge	
		Explicit knowledge	
		Tacit knowledge	

including conference proceedings, book chapters, editorials, notes, and comments, were eliminated from the analysis. Additionally, 157 duplicate articles were removed. We applied the Geissdoerfer et al. (2018) snowballing technique to minimize the inclusion of redundant and irrelevant research. After reviewing the titles and abstracts, an additional 529 articles were excluded. A comprehensive examination was then conducted on the remaining studies, with particular emphasis on their substantive aspects. Following the individual readings of the remaining 77 articles, a further reduction was implemented, resulting in the exclusion of an additional 19 papers. Finally, the authors performed citation chaining on the remaining 58 articles using

Google Scholar, which led to the inclusion of three more articles. Consequently, the final sample size consisted of 61 studies.

4 | FINDINGS

4.1 | Descriptive content analysis

The following section includes descriptive statistics of the obtained articles. The following section attempts to respond to this manuscript RQ1—What is the research profile of prior literature concerning MAC, KM, and environmental and social sustainability.

The year wise classification (Figure 3) of the publications suggests that fewer studies were published before 2019 and research on this gained traction only after 2020. As depicted in Figure 3, this literature strand is experiencing a steady rise in scientific production since the year 2019.

The data presented in Figure 4 illustrate the distribution of articles across the top 12 scientific journals (at least two publications on KM, MAC, and sustainability literature); thus, delineating the multidisciplinary nature of the research topic. However, it is possible to observe that despite discussing MAC, accounting focused scientific journals are missing. Henceforth, this could provide an interesting perspective for future research scholars.

The geographical scope of the shortlisted articles included within this SLR shows that most of the studies are centered on the United States of America and China (Figure 5), thereby revealing

TABLE 2 Exclusion and inclusion criteria.

| Inclusion criteria	Exclusion criteria
Articles centered on knowledge management, sustainability, and management control systems	Less likely peer-reviewed bodies of work such as book chapters, conference proceedings, reports, surveys, and other sources
Peer-reviewed articles published on journals	Non-English publications
Articles available in full text	Articles which do not focus on knowledge management, sustainability, and management control notions
Articles published up to October 2023	Scholarly publications outside of journal articles
Articles written in English	Duplicate articles
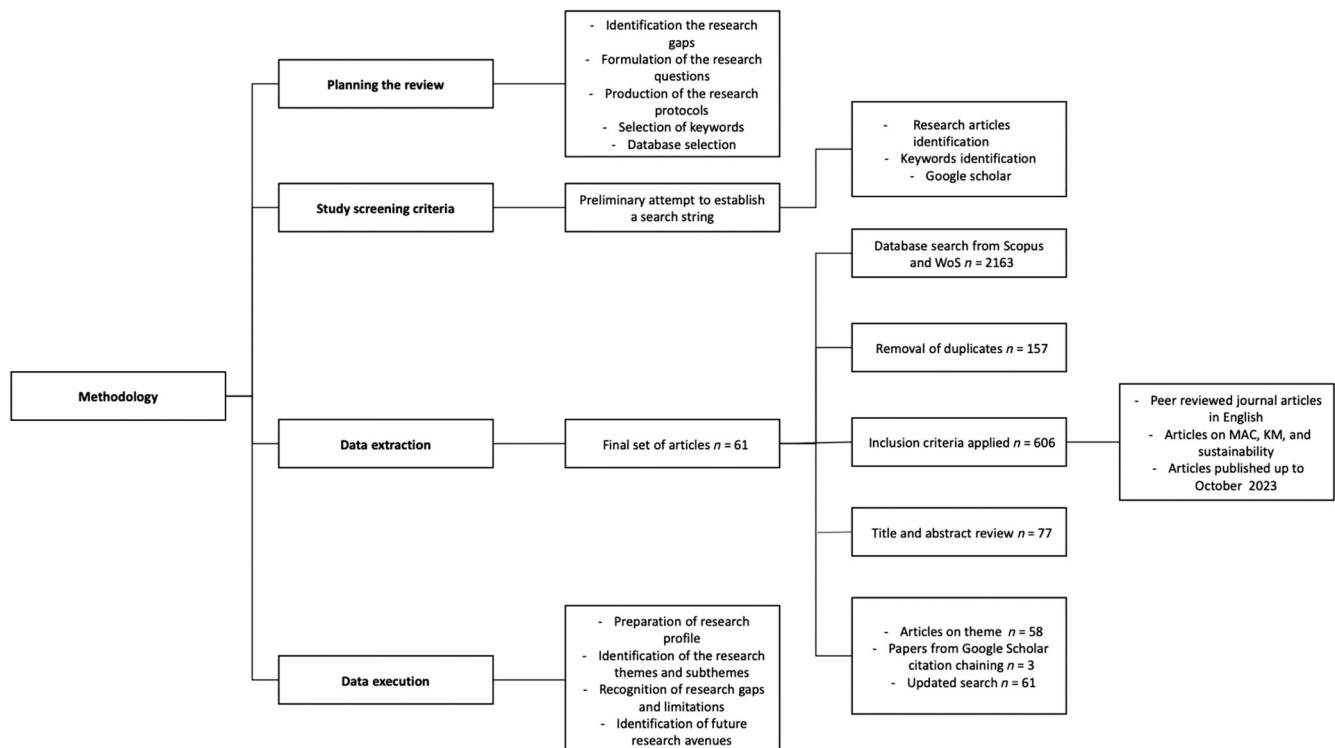
FIGURE 2 Systematic literature review employed protocol. KM, knowledge management; MAC, management accounting and control.
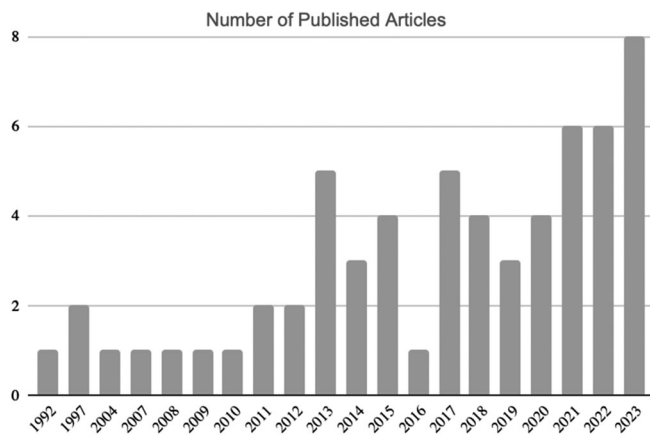
FIGURE 3   Number of articles tackling knowledge management, management accounting and control, and sustainability published over the past 21 years.

FIGURE 5   Geographic scope of the short-listed studies included in this systematic literature review database.

FIGURE 4   List of journals with two or more publications on the topic discussed within this systematic literature review.

FIGURE 6   Methodological approaches adopted by the short-listed articles.

scope to conduct research within other geographical contexts such as European countries and other emerging economies.

It is observable that most researchers tend to adopt the quantitative methodological approach (Figure 6) as their preferred method to explore the notions of KM, MAC, and sustainability, thus calling for more qualitative studies and literature reviews.

Whereas Figure 7 underlines the most cited articles. First, Dumont et al. (2017) does tackle the concept of green human resource management and how organizations can nurture green behaviors and knowledge sharing among employees while also establishing rules and norms aimed at promoting the diffusion of sustainability logics. Whereas, the second most cited article (Laosirihongthong et al., 2013) tackles how MAC together with KM can be deployed to pursue practices of green supply chain management. Furthermore, the above mentioned paper helps delineate the role MAC have in evaluating the environmental and intangible performance through the organization focus on green supply chain management practices and actions (Laosirihongthong et al., 2013). Finally, the third most cited article, Kraus et al. (2020), included within this manuscript sample, discusses the influence of corporate social responsibility (CSR) on organizations environmental strategy and performance.
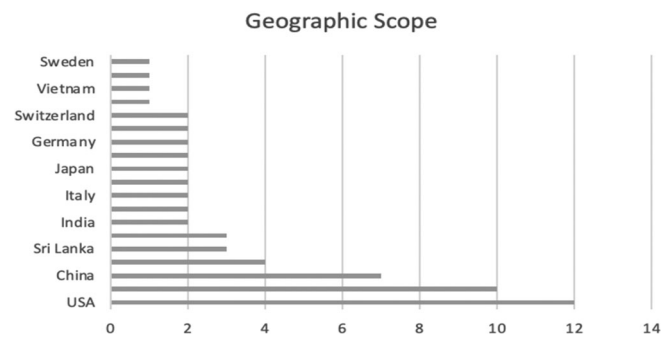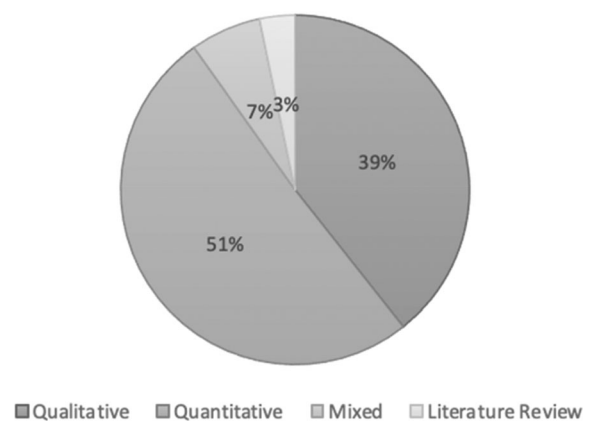

FIGURE 7   Top 10 cited articles presenting empirical evidence concerning management accounting and control, knowledge management, and sustainability.

4.2 | Emerging thematic dimensions

To identify the main thematic areas and establish the findings of the present SLR, the authors have individually evaluated all 61 studies in an attempt to establish their main commonalities and themes. The researchers employed a content analysis technique since it is deemed as one of the most appropriate methods for systematically classifying,

identifying and coding textual data into thematic dimensions (Chauhan et al., 2022; Truant et al., 2024). Indeed, the authors employed a three step methodology to establish unbiased and clear reports of the key themes discussed by the shortlisted articles. First, one author assigned open codes to all 61 shortlisted articles. Second, the authors adopted both an inductive and deductive approach to combine the previously established open codes into axial codes. Finally, the authors assessed the axial codes to classify the various thematic dimensions presented in the following sections. The notions and key themes identified, represented by (i) CSR, (ii) sustainability reporting, (iii) sustainable supply chain management (SSCM), (iv) human resource management, (v) green innovation, and (vi) university perspective, attempt to respond to this manuscript RQ2—What are the pressing key themes at the intersection of MAC, KM, and sustainability.

4.2.1 | Corporate social responsibility

The significance of CSR in business operations has gained momentum in recent years. Businesses are now expected to pursue nonfinancial indicators like environmental and social impact in addition to financial performance (Leith & Piper, 2013; Yanine et al., 2020). Businesses now understand how important KM systems are to the successful implementation and tracking of CSR projects. Hence, scholarly literature underlines the convergence of CSR, KM, and MAC notions since the above mentioned three elements do nurture the sustainability logics of organizations aimed at fostering their environmental sustainability performance (Cugueró-Escofet & Rosanas, 2020; Karmeni et al., 2018; Kraus et al., 2020; Latan et al., 2018). Indeed, from the axial codes established to analyze the shortlisted scholarly literature, CSR emerges as a central theme that tackles MAC, KM, and sustainability logics.

When it comes to tracking and assessing CSR programs and logics, MAC systems are essential. Since MAC systems encourage accountability and openness, they can also help achieve CSR goals in relation to environmental and social initiatives (Kolar et al., 2009). From this point forward, companies can demonstrate their transparency and give stakeholders valuable information about their commitment to sustainability performance and logics by putting in place procedures for monitoring and reporting CSR-related KM activities (Beaugency et al., 2015). Organizations in turn can assess how well their KM procedures are working and how they affect the objectives and logics of sustainable development by creating pertinent key performance indicators (KPIs) (Karmeni et al., 2018). Examples detailed in literature concerning KM practices within CSR are the following: external knowledge integration, which supports organizations need to collaborate con external stakeholders and professionals; knowledge retention, associated with training, and recruitment costs of acquire new human capital to include into the CSR dimension of the business and knowledge sharing effectiveness, detailed as the usage of knowledge sharing platforms (Beaugency et al., 2015; Cugueró-Escofet &
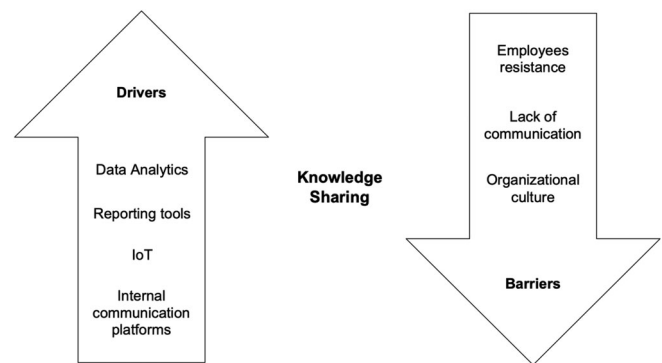

FIGURE 8 Graphical representation of knowledge sharing barriers and drivers within the management accounting and control context. IoT, Internet of Things.

Rosanas, 2020; Karmeni et al., 2018; Kraus et al., 2020; Latan et al., 2018). Figure 8 graphically summarizes potential enablers and barriers to knowledge sharing practices within MAC systems.

For example, CSR through KM and MAC involves embedding sustainability principles that are tied to the organizational culture, thus promoting the knowledge diffusion, dissemination, and training (Beaugency et al., 2015). Additionally, MAC and CSR performance encourage continuous culture of KM and adaptability thus underscoring the pivotal role of those three key notions and how they all contribute to promoting firms' nonfinancial disclosure and performance (Karmeni et al., 2018). Data analytics, reporting tools, Internet of Things (IoT) and internal communication platforms, play crucial roles as drivers of KM within MAC by enabling the acquisition, processing, dissemination, and utilization of valuable data and intel, thereby promoting statistical analysis, machine learning and the reporting of the obtained insights (Karmeni et al., 2018). Furthermore, through IoT and internal communication platforms organizations can nurture their interconnectedness and data availability thus nurturing MAC and promoting KM (Beaugency et al., 2015; Cugueró-Escofet & Rosanas, 2020; Karmeni et al., 2018; Kraus et al., 2020; Latan et al., 2018). On the other hand, the following dimensions hinder KM within MAC systems: employees' resistance can instill a fear of change, which hinders the adoption of new knowledge, practices, and systems, thereby fostering a working environment, which lacks awareness of KM, MAC, and CSR issues (Kraus et al., 2020). Second, organizational culture can hinder KM, CSR, and MAC within companies as it can establish resistance to change, knowledge sharing practices, thus dampening organizations' ability to innovate (Beaugency et al., 2015). Moreover, the foregoing notion may also stem from hierarchy and bureaucracy, which hinders organizations KM, MAC within CSR logics (Yanine et al., 2020). Finally, the obtained thematic dimension underscores the importance of communication. Indeed, the lack of it can act as a barrier to KM, MAC within CSR since firms inefficient communication and highly structured business divisions into silos dampens their capability to take advantage of knowledge, which can then inform their MAC systems (Bresciani et al., 2023).

4.2.2 | Sustainability reporting

Sustainability has become a critical aspect to businesses operations and success; hence, accurate and transparent nonfinancial reporting practices are now essential to organizations (Solana-González et al., 2021). Sustainability reporting results rely on MAC systems and KM practices since organizations have to join their "forces" to establish reporting practices that appropriately and comprehensively present their environmental and social commitment and performance (Solana-González et al., 2021).

According to Alsharari and Aljohani (2023), sustainability reporting is essential for informing stakeholders about a company's environmental, social, and governance (ESG) performance. This is due to the fact that sustainability reporting enables businesses to foster their transparency, responsibility, and trust while also communicating their dedication to sustainable practices and logics (Alsharari & Aljohani, 2023; Jordão & Novas, 2017). To do so, organizations must effectively manage and control their KM practices and MAC to ensure that relevant information and performance are captured, measured and reported (De Palma & Dobes, 2010). But in order to guarantee comprehensive and accurate information in sustainability reports, businesses must first recognize and gather pertinent information about their environmental and social sustainability initiatives. (Deb et al., 2023; Mishra et al., 2023). Furthermore, to facilitate KM, organizations can use standardized reporting frameworks and guidelines, such the Sustainability Accounting Standards Board (SASB) framework or the Global Reporting Initiative (GRI), to provide uniform and comparable nonfinancial reports (Massaro et al., 2019; Ortega-Lapiedra et al., 2019).

Finally, in order to provide accurate and trustworthy data, organizations need to use knowledge integration tools to choose the best tools and procedures for measurement (Deb et al., 2023; Moilanen, 2007) through digital tools such as data analytics and IoT sensors (Chen et al., 2009).

This cluster does details articles that underscore empirical evidence suggesting some potential examples. First, MAC systems are useful in promoting companies' tracking of their ESG measures so that these entities can effectively and accurately communicate to external stakeholders their performance metrics in relation to ESG (Solana-González et al., 2021). The foregoing details are essential for a company's sustainability reporting as it demonstrates its commitment. Second, organizations emphasize KM practices (such as data collection, standardized reporting, internal reporting, materiality assessments, and appropriate and standardized accountability and transparency frameworks) to promote the communication of sustainability initiatives (Deb et al., 2023). This shared knowledge serves as a foundation for accurate reporting on environmental and social commitments. Third, MAC systems can be configured to align KM and ensure companies' sustainability reporting meets the consistency and comparability demanded from the GRI and their nonfinancial reporting (Massaro et al., 2019). For instance, companies may implement MAC systems that incorporate sustainability specific systems and functionalities whose design is to capture, track, and report key sustainability indicators that fall within the GRI standards (Massaro et al., 2019).

4.2.3 | Sustainable supply chain management

In a world which is extremely interconnected, managing supply chains in a way that complies with regulations and takes care of social and environmental concern presents a complex set of challenges (Laosirihongthong et al., 2013). These constraints create an ideal environment for adopting a strategic approach to SSCM (Ozdemir et al., 2022; Sahoo et al., 2022; Zhen et al., 2012). The integration of KM practices, which enables companies to effectively regulate and monitor sustainable activities across the whole supply chain, is a crucial component of the SSCM (Khanra et al., 2021; Sahoo et al., 2022). Organizations can gather, arrange, utilize, and manage knowledge in a way that fosters the spread of sustainable projects by utilizing the right MAC systems and KM (Ali et al., 2023; Sahoo et al., 2022). Fundamentally, the scholarly literature underscore the role of the following KM practices: cross-functional collaboration across various businesses to ensure that organizations align their sustainability objectives and initiatives; suppliers training concerning the adopted programs and workshops to nurture their sustainability principles and performance; and knowledge sharing platforms to nurture the information of stakeholders across the entire supply chain through guidelines, standards, and others (Liu et al., 2022; Mishra et al., 2023; Radtke et al., 2023). Indeed, organizations can set up communication channels and data sharing devices that feed into the management accounting system by using the right KM systems (Ali et al., 2023; Beaugency et al., 2015; Lim et al., 2017). Organizations can cooperate to improve their control systems' contribution toward a sustainable future by exchanging performance and information (Radtke et al., 2023). Finally, scholars highlight the role digital tools have in supporting and nurturing KM efforts for SSCM (Liu et al., 2022; Mishra et al., 2023; Radtke et al., 2023). However, it is noteworthy to mention that scholars have raised concerns regarding data privacy and security especially for cross organizational collaboration and global supply chains (Deb et al., 2023) and the use of digital tools (Yin & Li, 2022).

For example, companies engaging in SSCM can engage in MAC and KM systems, which promote the establishment of communication channels and employ data-sharing devices allow them to nurture their SSCM (Lim et al., 2017). Moreover, SSCM forces organizations to monitor sustainable activities, which are outside the boundaries of their firm thus forcing management and controllers to engage and actively pursue appropriate KM techniques, which allow them to gather information from external actors and entities. Additionally, in doing so, organizations foster the spread of sustainable projects among their entire supply chain hence promoting non-financial performance and virtuous endeavors (Sahoo et al., 2022).

4.2.4 | Human resource management

Since nonfinancial performance has grown significantly in relevance for firms operating within diverse industries, businesses understand how critical it is to draw in, train, and keep workers who share their commitment toward sustainability principles (Dumont et al., 2017; Karmeni et al., 2018; Wei et al., 2023). Sustainable human resource management (SHRM) tackles how firms can leverage MAC and KM practices to nurture sustainable behaviors, logics, and outcomes from organizations human resources (Ortega-Lapiedra et al., 2019). Fundamentally, the following are some examples of KM practices which impact SHRM: learning and development programs, described as structured experiences whose purpose is to nurture structured learning and development; knowledge sharing tools, such as digital platforms that foster collaborative endeavors and knowledge repositories; and communities of practice which nurture knowledge sharing and promote the collaboration among actors such as employees (Ortega-Lapiedra et al., 2019).

dos Santos et al. (2023) state that in order to foster a sustainable culture and mindset, managers and CEOs should incorporate sustainability logics and principles into their decision-making procedures, communications, and ethics. In doing so, organizations are also able to address the businesses and they can create and execute incentive programs (through MAC) that identify and reward staff members for their dedication to sustainable practices through performance evaluation systems (Ali et al., 2023). Among the instruments and processes available to firms to foster SHRM are financial incentives, nonfinancial rewards, promotion chances, and employee programs with a sustainable focus (Ortega-Lapiedra et al., 2019). In order to assess employees' contributions to sustainability, companies can create and execute balanced scorecards, KPIs, and performance reviews (Ali et al., 2023; Dumont et al., 2017; Ortega-Lapiedra et al., 2019; Yanine et al., 2020). For example, through MAC companies can recognize the growing importance of nonfinancial performance and nurture sustainable behaviors among its workforce (Dumont et al., 2017; Wei et al., 2023). Embracing SHRM, KM, and MAC allows companies to strength the integration of HR processes within their training thus promoting the attraction and retention of employees committed to sustainability (Ortega-Lapiedra et al., 2019). Finally, in line with the suggestions made by Ali et al. (2023), Dumont et al. (2017), and Yanine et al. (2020), organizations can implement balanced scorecards, KPI, and performance reviews to assess employees' contributions to sustainability. The foregoing holistic approach aligns with the company's commitment to nurturing a sustainable workforce and is reflective of their commitment to non-financial performance through MAC and KM techniques.

4.2.5 | Green innovation

The process of creating environmentally friendly goods, services, and procedures, known as "green innovation," has become a vital tool for businesses looking to lessen their environmental effect (Sales, 2019; Zandi et al., 2019). Businesses may create sustainable solutions and logics, comprehend consumer demands and stakeholder expectations, and more with KM, both internally and externally (Deb et al., 2023; Zandi et al., 2019). From this point forward, efficient KM guarantees that assets, know-how, abilities, MAC, and perceptions are gathered and used to support businesses' green innovation (Abbas & Sagsan, 2019; Sales, 2019; Zandi et al., 2019). Additionally, in order to foster innovations and logics focused on sustainability, organizations must promote a culture of knowledge exchange among managers and employees (Bresciani et al., 2023; Karmeni et al., 2018). The promotion of green innovation and business culture on sustainable management accounting systems is thought to benefit from open communication, effective leadership, knowledge-sharing platforms (Awan, Arnold et al., 2021; Awan, Nauman et al., 2021; Radtke et al., 2023), collaborations, and suitable incentive systems (Bresciani et al., 2023; Deb et al., 2023). For example, collaborating with NGOs and academic institutions gives businesses access to specialized information that helps them stay at the forefront of sustainability innovation, research, and development, guaranteeing that they have the knowledge necessary to change and advance MAC. (Sales, 2019; Terán-Bustamante et al., 2021; Zandi et al., 2019).

For example, through effective KM, organizations can harness internal and external knowledge, which can then be managed through MAC to nurture internal and external knowledge concerning the firm's ability to innovate. In doing so, managers are able to find suitable solutions, understand consumer demands, and meet stakeholders' expectations (Zandi et al., 2019). Henceforth, efficient KM and MAC systems ensure that the company's capital, resources and skills are appropriately directed toward green innovation initiatives (Abbas & Sagsan, 2019). Another example is that, through MAC and KM organizations can establish open communication, effective leadership governance models, and platforms aimed at sharing knowledge that can contribute to the diffusion and success of new sustainability projects and innovations (Zandi et al., 2019).

4.2.6 | Universities perspectives

KM, MAC, and sustainability logics within the university setting are considered crucial for educational institutions to be successful and viable in the long run (Terán-Bustamante et al., 2021).

Universities are regarded as knowledge-intensive institutions since KM entails efficiently gathering, applying, and disseminating enormous volumes of knowledge (de la Torre & Berbegal-Mirabent, 2022). The academic research, instruction, best practices, and administrative processes that occur in academic institutions make this clear (Terán-Bustamante et al., 2021). Universities can take advantage of their intellectual capital through KM systems, which promote innovation and ongoing development. Universities can now share important information, allowing companies (via joint ventures) and upcoming scholars, students, and researchers to gain from the pooled experience and understanding of sustainable behaviors,

practices, and models (Padilla Bejarano et al., 2023; Terán-Bustamante et al., 2021).

One key dimension of the literature that tackles MAC, KM, and sustainability focuses on the role MAC systems have within universities and how they can support them in effectively manage their knowledge and pursue sustainability performance and objectives. Indeed, in order to attain the intended results, MAC compels universities to create goals, monitor performance (which tracks and measures KPIs across many departments and activities), and participate in decision-making processes (de la Torre et al., 2022). As a result, universities can effectively allocate resources, support sustainability logics, and encourage acceptable nonfinancial reporting practices thus nurturing their performance in relation to nonfinancial results thus promoting their environmental and social sustainability (Padilla Bejarano et al., 2023; Terán-Bustamante et al., 2021).

For example, through MAC, universities are able to employ MAC systems, effectively allocate resources, and support their sustainability logics hence promoting environmental and social sustainability through their knowledge intensive capital (Padilla Bejarano et al., 2023). Indeed, through strategic goals setting and performance monitoring, universities can align their operational processes with their goals from a nonfinancial results and sustainable practice point of view (Terán-Bustamante et al., 2021).

4.2.7 | Key results

The findings shed light on the *role of MAC in managing knowledge for sustainability*. The role of MAC systems in developing pertinent KPIs can be further clarified (Chen et al., 2015; Cugueró-Escofet & Rosanas, 2020; Karmeni et al., 2018). These KPIs should represent societal expectations and offer a clear framework for integrating sustainability and nonfinancial reporting into business strategies and decision-making logics. In fact, transparency and accountability in management control systems promote sustainability (Kolar et al., 2009). Organizations can show transparency and educate stakeholders by documenting and disclosing KM activities connected to *CSR* (Beaugency et al., 2015). In addition to fostering trust, this helps organizations stay mindful of societal norms. Additionally, in order to improve sustainable practices, staff collaboration and information sharing are encouraged by performance assessment methods and procedures (Costa & Forte, 2022; Ströbele & Wentges, 2018; Jager-Roschko & Peterson, 2022).

As Yanine et al. (2020) point out, the process of knowledge integration does in fact enable organizations to select the right tools and techniques for performance assessment. Furthermore, it is critical to collect and disseminate data about sustainability through the use of new technologies such as IoT sensors and data analytics (Chen et al., 2009). This eliminates organizational silos and helps to improve data consistency (Schnellenbach-held and Steiner, 2014; Thomson et al., 2009; Witherspoon et al., 2013). Furthermore, it is evident that centralized KM systems offer an efficient means of accessing past data, which aids businesses in their continuous assessment and

tracking of their advancement toward sustainability goals (Bresciani et al., 2023; Brivot, 2011; Deb et al., 2023; De Palma & Dobes, 2010; Euske et al., 2011; Massaro et al., 2022).

The way in which *SSCM uses KM concepts* to assist businesses in supervising and tracking sustainable supply chain activities is another pertinent piece of evidence. Control systems and KM assist organizations in gathering, organizing, utilizing, and managing knowledge to support sustainable endeavors (Sahoo et al., 2022). In order to support the management accounting process, KM systems offer channels for communication and data exchange (Greenwood & Kamoche, 2013). According to Beaugency et al. (2015), this aids businesses in reviewing, defining, and identifying SSCM goals as well as inefficiencies in carbon emissions, waste production and management, and supplier performance.

By sharing performance and information (Radtke et al., 2023; Witherspoon et al., 2013; Zhen et al., 2012), employing best practices, successful initiatives, and documented experiences to innovate and enhance supply chain sustainability impact monitoring and evaluation (Deb et al., 2023; Greenwood & Kamoche, 2013), organizations can improve the sustainability and operational efficiency of their control systems. Supply chain management and competitiveness can be increased by fostering KM, which will also encourage and enhance managerial accounting systems and practices (Liu et al., 2022). In fact, businesses need to implement sustainable practices that are completely integrated into the supply chain management control system in order to keep a competitive advantage, going beyond knowledge acquisition (Sahoo et al., 2022). To increase supply chain sustainability and competitiveness, they must disseminate knowledge to a variety of actors and create an environment where key stakeholders may put that knowledge into practice (Ilyas et al., 2020).

Moreover, academic scholarship that specializes in SSCM have voiced worries about data security and privacy, especially when it comes to cross-organizational collaboration and global supply chains (Deb et al., 2023). In order for employees and supply chain partners to effectively contribute to the SSCM, businesses may need to ensure that they possess the necessary competencies and skills to recognize the value added by KMs (Sahoo et al., 2022). Additionally, by establishing protocols and risk indicators, MAC systems can support this sense (Duan et al., 2024).

At the nexus of KM, sustainability, and MAC, *human resources* play a critical role (Kamoche et al., 2014; Karmeni et al., 2018; Zhen et al., 2012). The integration of sustainability concepts into decision-making processes, communications, and ethical standards is a possibility for leaders within an organization (dos Santos et al., 2023; Yang et al., 2016). Conversely, employee engagement and involvement have emerged as critical factors in cultivating a sustainable culture (Ali et al., 2023; Bresciani et al., 2023; Dumont et al., 2017; Kamoche et al., 2014; Solana-González et al., 2021; Tafkov et al., 2022). Organizations must be able to set up reward programs like performance assessment systems that recognize and reward sustainable actions and results if they hope to improve behavior from both leaders and workers (Kamoche et al., 2014). Ortega-Lapiedra et al. (2019) assert that the MAC must adhere to the company's sustainability policy,

provide explicit direction on performance objectives, foster the creation of environmentally friendly innovations, and foster a corporate culture that encourages employee collaboration and knowledge sharing (Ali et al., 2023; Dumont et al., 2017; Karmeni et al., 2018). It is evident that human resource management is another area of growing importance. Employee incentives, according to Ortega-Lapiedra et al. (2019), include a broad range of benefits offered to employees that include cash bonuses, noncash benefits, chances for professional advancement, and initiatives that honor, and value individuals who choose a sustainable lifestyle (Ali et al., 2023). Furthermore, performance goals and sustainability goals may be effectively aligned through the use of MAC systems and technology. As a result, companies must create and implement KPIs, balanced scorecards, and performance reviews that are centerd on evaluating employees' contributions to sustainability (Ali et al., 2023; Dumont et al., 2017; Ortega-Lapiedra et al., 2019; Yanine et al., 2020).

In order to ensure the success of sustainability goals, it is clear that sharing and disseminating sustainable practices and research through KM aids in managing how they are integrated into MAC, strategic planning, and operational procedures (Karagiorgos et al., 2022). But, the necessity for organizations to have linkages to *universities* becomes apparent (de la Torre & Berbegal-Mirabent, 2022; Padilla Bejarano et al., 2023; Terán-Bustamante et al., 2021). In fact, the latter come up with novel solutions for environmental problems, which advances knowledge and fosters greater collaboration (Padilla Bejarano et al., 2023). It became clear that in order to support sustainable practices, it is necessary to create an environment that encourages information sharing, remove obstacles, and use technology-enabled platforms to support employee cooperation and knowledge sharing (Costa & Forte, 2022; Mishra et al., 2023; Radtke et al., 2023; Terán-Bustamante et al., 2021).

In light of this, it is critical to work toward knowledge integration with the use of technology to enhance departmental collaboration, avoid duplication of effort, and foster a unified strategy for sustainability (Alsharari & Aljohani, 2023). Companies should be forced to consider which MAC tools and technologies they may utilize in accordance with their sustainability goals by this integration, which should necessitate a centralized KM system (Ali et al., 2023; Dumont et al., 2017; Ortega-Lapiedra et al., 2019; Yanine et al., 2020).

Green innovation creates new and intriguing problems for sustainability management. Organizations must, in particular, construct MAC systems to foster cooperation and boost green innovation while mitigating risks (Sales, 2019; Zandi et al., 2019). Indeed, the process of knowledge generation and the advancement of MAC and environmentally sustainable innovation is greatly aided by the involvement of suppliers, consumers, nongovernmental organizations, and academics in order to create innovation, or better green innovation (Sales, 2019; Terán-Bustamante et al., 2021; Zandi et al., 2019). In fact, the process of forming partnerships with suppliers may make it easier to use sustainable materials and production techniques; additionally, understanding customer preferences may result in the development of

ecologically friendly products that satisfy market demands (Tandon et al., 2021; Bresciani et al., 2023; Kraus et al., 2020; Rehman et al., 2021). In order to give businesses the chance to acquire experience and knowledge in particular fields and to stay at the forefront of research and development to establish appropriate MAC systems focused on sustainability, it is challenging to establish and maintain collaboration with NGOs and academic institutions (Padilla Bejarano et al., 2023; Terán-Bustamante et al., 2021; Zandi et al., 2019).

5 | FRAMEWORK DEVELOPMENT

Based on the thematic analysis previously discussed, the authors develop a conceptual theoretical framework (Figure 9), which seeks to underline the interplay between KM, MAC, and sustainability notions (Chopra et al., 2021). First, the developed framework highlights the dimensions of KM, and it underlines the connection between KM and the environmental control dimension of MAC systems. Second, the conceptual theoretical framework highlights the role knowledge intensive stakeholders such as universities have in promoting MAC systems and sustainability attitudes and how they engage in KM and MAC in an attempt to promote sustainability logics within their own organizations while also nurturing external actors and stakeholders' knowledge and performance. Third, the developed framework positions the effect KM has on the MAC notion by connecting the identified practices with the various dimensions traditionally associated with MAC.

The conceptual theoretical framework established in Figure 9 highlights various dimensions of the notion of KM (acquisition, assimilation, transformation, utilization, and creation) and it underlines their connection with the environmental control dimension of organizations' MAC systems (Battaglia et al., 2016). Knowledge acquisition involves gathering knowledge from internal and external stakeholders, knowledge assimilation details how organizations focus on using the foregoing acquired knowledge then knowledge transformation allows companies to use said knowledge and feed it to MAC to support sustainability logics (knowledge utilization) (Bresciani et al., 2023).

The foregoing framework also details various dimensions of control, which are intended as follows: sustainability control, defined as the integration of environmental, social and economic considerations into a business strategy, management practices and decision making processes (Alsharari & Aljohani, 2023; Endenich & Trapp, 2020); cultural control, intended as the organizational culture, which shapes its strategic objectives and norms (Battaglia et al., 2016); administrative control, which involves the enforcement of policies, procedures and regulations (Battaglia et al., 2016; Chen et al., 2009); and process control detailing the operational procedures and processes whose purpose is to ensure businesses meet their operational objectives (dos Santos et al., 2023).

Finally, organizations can create new knowledge from novel insights and innovative approaches and then direct said insights toward to knowledge utilization step. The foregoing paragraph

FIGURE 9 Conceptual theoretical framework relating management accounting and control (MAC), knowledge management, and sustainability. CSR, corporate social responsibility.
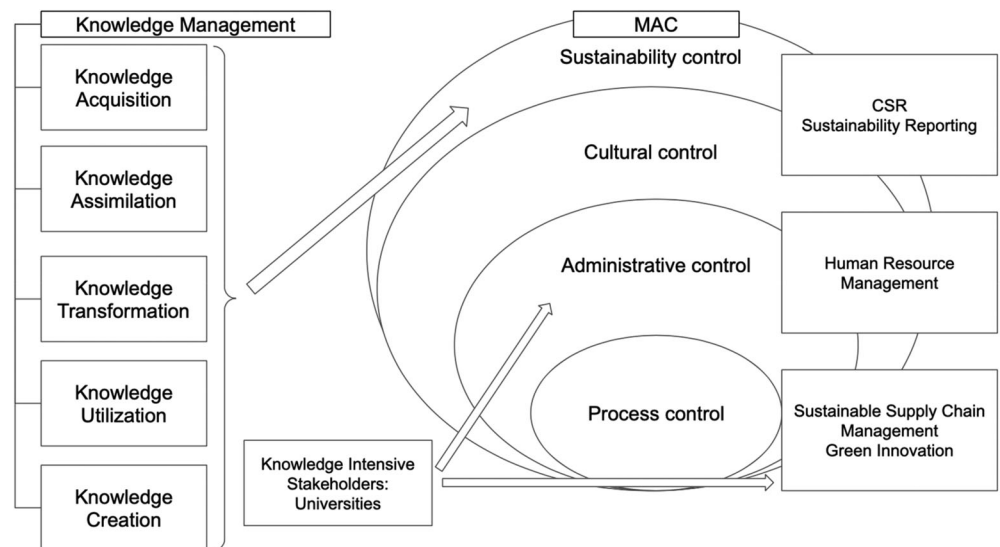
underscores the importance of KM to support companies MAC and promote their environmental and social sustainability. Indeed, in Section 4 of this manuscript, throughout the identified thematic dimensions, it is quite visible how KM takes various dimensions and forms, henceforth, we chose to indicate all its dimensions within our proposed framework. This is meant to further reinforce how KM concepts are tightly connected with MAC, and particularly, with sustainability logics and performance evaluation.

Thereafter, the developed theoretical framework underlines the connection between the environmental control dimension of MAC and companies' sustainability reporting and CSR practices; thus, further reinforcing the centrality of MAC systems and tools to effectively communicate change and implement it to nurture CSR. Nonetheless, the conceptual theoretical framework delineates how multiple dimensions of MAC are impacted by KM and how that interplay between the two abovementioned notions affects various aspects of sustainability logics. First, the developed framework underlines the connection between KM, cultural and administrative controls and their impact on sustainability logics associated with human resource management. For instance, MAC serves as a strategic tool for companies to acknowledge the escalating significance of nonfinancial performance and foster sustainable behaviors among employees (Dumont et al., 2017; Wei et al., 2023). The adoption of SHRM, KM, and MAC enables organizations to enhance the integration of processes, particularly in training, thereby facilitating the attraction and retention of a workforce dedicated to sustainability (Ortega-Lapiedra et al., 2019). Following recommendations by Ali et al. (2023), Dumont et al. (2017), and Yanine et al. (2020), companies can deploy comprehensive methods such as balanced scorecards, KPIs, and performance reviews to evaluate employees' contributions to sustainability. This inclusive approach aligns seamlessly with the company's commitment to cultivating a sustainable workforce, showcasing its dedication to nonfinancial performance through the application of MAC and KM methodologies Second, the framework highlights the connection between KM, process controls and sustainability logics associated

with SSCM and processes green innovation (Awan, Arnold et al., 2021; Awan, Nauman et al., 2021). For instance, by effectively managing both internal and external knowledge, organizations can tap into a wealth of insights. This knowledge can then be systematically organized and utilized to nurture an understanding of the firm's innovation capabilities, facilitated through effective management processes. This approach empowers managers to identify suitable solutions, comprehend consumer demands, and fulfill stakeholder expectations, as highlighted in the study by Zandi et al. (2019). Consequently, the synergy of efficient KM and adept management processes ensures that the company's capital, resources, and skills are channeled effectively toward initiatives in green innovation, a sentiment echoed by Abbas and Sagsan (2019). Finally, the established framework connects the notions of KM, environmental and cultural controls and sustainability logics associated with organizations CSR and sustainability reporting. Environmental and cultural norms weave the narrative of nonfinancial reporting and organizations CSR activities and logics. The foregoing synergy does manifest as organizations leverage KM to empower environmental MAC thus nurturing sustainability through cultural norms.

5.1 | Avenues for future research

Thereafter, the authors responded to this manuscript RQ3—by providing prospective scholars with future research themes that highlight research gaps of the existing literature concerning KM, MAC, and sustainability. In reviewing the existing literature concerning the abovementioned notions, the authors of this article were able to manually identify and extract research lacunae by separately reading the articles that allowed the development and proposition of future research avenues. Table 3 below contains the authors' proposed research questions, emerged by the literature review, and hypothesis whose aim is to bolster academics to explore this domain and continue contributing to both its theoretical and practical understanding to further our

TABLE 3 Research gaps and proposed research questions.

Researchable issues	Research gaps	Potential research questions
Environmental management accounting (EMA)	There is a need to identify and discuss how the latest information and knowledge management technologies can enhance companies' environmental performance evaluation	RQ: How do information technologies affect companies KM and EMA?
		RQ: What are the effects of information technologies on companies' management control and knowledge management systems?
		RQ: How do green dynamic capabilities affect companies KM and EMA?
		RQ: How does tacit knowledge affect EMA performance evaluation concerning the sustainability dimension?
Knowledge hiding	There is a need to better comprehend how knowledge hiding affects companies' management control and performance evaluation concerning firms' environmental impact	RQ: What are the effects of knowledge hiding on companies' sustainability performance?
		RQ: How does knowledge hiding impact companies' sustainability performance?
		RQ: Does knowledge hiding from managerial personnel carry high degrees of risk concerning a company's sustainability performance?
		RQ: How can companies prevent knowledge hiding and support their MAC?
		RQ: How does top management support impact companies' management accounting and environmental KM?
		RQ: To what extent do top management attitudes affect companies' sustainability management accounting systems?
Environmental performance	There is a growing need to understand to which extent norms and legislation promote KM and sustainability management control systems	RQ: Are governmental standards, norms and goals the catalysts for companies' sustainability performance rationale?
		RQ: To what extent do companies pursue sustainability performance valuation to the detriment of other financial and operational performance?
		RQ: How does KM promote companies' compliance with governmental norms, goals, and legislations?
		RQ: Are corporations operating in sensitive sectors engaging with KM and MAC because of institutional pressure?
		RQ; What key stakeholders impact companies' environmental performance and KM?
		RQ: What effects do institutional stakeholders have in companies KM and MAC systems?
Environmental knowledge sharing	There is a need to better comprehend the factors influencing knowledge sharing for environmental management control systems	RQ: What systems, tools and frameworks promote knowledge sharing to enhance environmental knowledge management systems?
		RQ: How does internal and external knowledge sharing affect companies' environmental management control systems?
		RQ: How do top management attitudes affect companies' knowledge sharing?
	There is a need to better comprehend the knowledge sharing attitudes of employees	RQ: How does the company environment affect employees' willingness to engage in knowledge sharing?
		RQ: What factors influence employees knowledge sharing concerning firms' environmental performance?

TABLE 3 (Continued)

Researchable issues	Research gaps	Potential research questions
		RQ: How do employees' attitudes affect companies' environmental management control systems efficacy and efficiency?
		RQ: What models, frameworks, and tools help promote employee's knowledge sharing to promote a company's sustainability performance?
		RQ: How do employees attitudes affect companies' sustainability decision making?
Environmental knowledge absorption	There is a scholarly need to comprehend how knowledge absorption affect EMA	RQ: How does knowledge absorption affect firms' environmental ambitions and performance evaluation?
		RQ: What effects does knowledge absorption have on companies' business models and strategy?
		RQ: How does knowledge absorption affect companies' green innovation?
		RQ: How does knowledge ownership impact KM and EMA?
		RQ: What systems and tools can be employed to promote knowledge receptivity?
		RQ: What managerial and professional skills improve CEO and CFO knowledge receptivity?
Internal and external knowledge management	A research gap remains concerning the role of internal and external knowledge management within management control systems	RQ: What impact does internal knowledge management have on firms' environmental performance, decision making, and strategy?
		RQ: What impact does external knowledge management have on firms' environmental performance, decision making and strategy?
		RQ: Can a manager's positive attitudes toward sustainability mediate companies internal and external KM ability?
		RQ: What factors influence internal KM within the management accounting context?
		RQ: What factors influence external KM within the management accounting context? RQ: How do internal and external knowledge affect sustainability management control systems?
Economic and environmental rationales	There is a growing need to comprehend how economic and environmental rationales might affect organizations' management control systems and their willingness to engage in knowledge sharing practices	RQ: How do economic and environmental conflicting rationales affect companies' management control and KM systems?
		RQ: How do economic and environmental contrasting elements hinder management control systems effectiveness?
		RQ: What effects do economic and environmental rationales have on firms' KM systems?
		RQ: To what extent do economic motives hinder companies' environmental KM?
		RQ: Can economic ambitions nurture knowledge retention?
		RQ: Can economic rationales promote knowledge hiding?
Climate perception	Scholars need to further investigate how climate and environmental degradation affect employees, managers and companies' willingness to engage in knowledge sharing and environmental management control	RQ: What role does climate perception play in promoting KM and environmental management control systems?

TABLE 3 (Continued)

Researchable issues	Research gaps	Potential research questions
		RQ: Are companies operating within virtuous countries more likely to engage in KM and EMA?
		RQ: Are corporations operating in highly polluted areas more likely to engage in KM and EMA?
		RQ: What stakeholders have the greatest influence on companies' perception of climate and natural resources degradation?
		RQ: Does management training mediate the climate and environmental degradation perception to promote KM and EMA?

Abbreviation: KM, knowledge management.

current insight into the topics at play. Therefore, Table 3 responds to this manuscript RQ3—What emerging issues are a promising agenda for future research concerning KM, MAC, and sustainability.

6 | CONCLUDING REMARKS

The aim and scope of the manuscript is to delve into the literature strand tackling the MAC, KM, and environmental and social sustainability notions (as graphically depicted in Figure 1) to systematically analyze its content, detail its descriptive statistics and construct a theoretical conceptual framework to inform future bodies of research (Bresciani et al., 2023; Chopra et al., 2021; Martins et al., 2019). Despite the interconnectedness between MAC, KM, and environmental and social sustainability, scholarly literature often addresses the foregoing issues in isolation (Abbas & Sagsan, 2019; Nkundabanyanga et al., 2021). Henceforth, it is necessary to systematize the academic discourse surrounding the interplay between MCA, KM, and sustainability (Battaglia et al., 2016; Bresciani et al., 2023; Chopra et al., 2021). Additionally, this body of literature seeks to address the need for frameworks that tackle environmental and performance evaluation aspects, due to their centrality in understanding how KM and MAC impact green projects (Chopra et al., 2021). Henceforth, the current body of literature is guided by the following three research questions:

RQ1. What is the research profile of prior literature concerning MAC, KM, and environmental and social sustainability?

RQ2. What are the pressing key themes at the intersection of MAC, KM, and sustainability?

RQ3. What emerging issues are a promising agenda for future research concerning KM, MAC, and sustainability?

This SLR of academic articles provides a thorough understanding of KM, MAC, and sustainability. Indeed, the present manuscript tries to address the research gaps previously discussed in Section 1 of this manuscript. Particularly, this manuscript addresses the need to further reinforce the connections between KM, MAC, and sustainability (Bresciani et al., 2023), and it develops a framework to clarify these connections (Chopra et al., 2021). The authors employed a rigorous and established methodological approach, a SLR, to gather journal articles from Scopus, WoS, and Google Scholar. Through the SLR approach, the authors aim to address three research questions. In particular, the researchers identified and established the main descriptive details concerning previously published research (RQ1) and its themes concerning KM, MAC, and sustainability logics using a content analysis technique (RQ2) (detailed in Section 4 of this manuscript). Additionally, this body of research constructs and details a promising agenda for future research concerning KM, MAC, and environmental and social sustainability (RQ3). Specifically, the present SLR underscores various research directions whose purpose is to further clarify notions such as knowledge hiding, climate perception, internal and external KM and environmental management accounting systems, tools and techniques. Indeed, the proposed research agenda detailed within Table 3 underscore the necessity for both qualitative and quantitative research studies.

Relevant theoretical and practical contributions are discussed in the following sections. Finally, a research agenda for future developments and the limitations of the research are presented.

6.1 | Theoretical contributions

This SLR is not just limited to summarizes and schematizes the academic literature concerning the relationship between the notions of KM, MAC, and environmental and social sustainability initiatives. It aims to foster the diffusion of empirical academic research among organizations, managers, and policymakers. Indeed, the present body of literature helps underscore the theoretical ramifications associated with the existing comprehension of the relationship between KM,

MAC, and sustainability. Additionally, this manuscript contributes to the future development of the research strand focusing on KM, MAC, and sustainability by providing a detailed profile of the selected journal articles. Specifically, in doing so, we were able to identify new directions and areas that require additional investigation, while also underscoring the need for additional conceptual theoretical framework, thereby responding to the call to action made by Bresciani et al. (2023), Deb et al. (2023), Jafari-Sadeghi et al. (2022), Liu et al. (2018) and Mayndarto and Murwaningsari (2021).

This body of work identifies the themes and patterns pertaining to the concepts of KM, MAC, and sustainability, thereby it carries theoretical contributions associated with its systematization of the academic discourse concerning the abovementioned notions and logics. Specifically, the authors have methodically reviewed the scholarly literature contained within Scopus, WoS, and Google Scholar (employed for citation chaining), which led to the identification and condensation of the KM, MAC, and sustainability research narrative.

Moreover, this manuscript contributes to theory by underscoring the need for MAC to develop knowledge and information necessary to plan, assess, and establish potential measures to monitor and assess organizations' environmental and social performance (Bresciani et al., 2023; Harrer & Owen, 2022; Johnstone, 2020). Specifically, this body of research carries theoretical implications by underscoring the vital role of organizations in adequately managing their KM and how MAC systems help evaluate and improve green, social, and ethical projects (Chopra et al., 2021; Martins et al., 2019). Additionally, the authors contribute to scholarly literature by addressing the research gaps identified and detailed within Section 1 of this manuscript, thus advancing our understanding of the scholarly literature on KM, MAC, and sustainability (Bresciani et al., 2023; Chopra et al., 2021). Indeed, this manuscript synthesizes the current empirical research focusing on various dimensions of KM, MAC, and sustainability such as CSR, sustainability reporting, SSCM, human resource management, green innovation, and university views. Finally, this body of research contributes to our theoretical understanding of KM, MAC, and sustainability by proposing an insightful and comprehensive research agenda. Its purpose is to guide future research efforts, thereby leading to a deeper and broader comprehension of the logics and notions of KM, MAC, and sustainability.

6.2 | Practical- and policy makers-contributions

This SLR carries several practical implications. First, by highlighting the important environmental and management accounting aspects and themes that are touched or affected by KM, it helps establish the connections that exist between KM, MAC, and sustainability (Bresciani et al., 2023). Henceforth, from a policy perspective, the present body of work could support the development of guidelines and regulations that encourage organizations to integrate KM logics into their MAC to support a sustainable and fair development.

Second, this publication should assist managers and practitioners in creating a balanced strategy and organizational culture that

supports KM systems and attitudes (Bresciani et al., 2023). Therefore, from a policy perspective, the nature of KM to support strategy creation and organizational culture should promote the development of norms and programs whose purpose is to promote international collaboration and knowledge sharing programs between various organizations and geographical contexts.

Third, this paper demonstrates to academic institutions and government agencies how partnerships, KM initiatives, and incubators can influence businesses' performance evaluation systems and sustainability logics by using relevant KPIs. Legislative bodies and organizations that support eco-friendly actions and behaviors should be particularly interested in this. Fourth, this SLR has practical ramifications for all parties involved in supply chain management, as one of the themes identified emphasizes the need for knowledge-sharing initiatives among all parties to advance sustainability that support SSCM (Ali et al., 2023; Taiwon & Suparta, 2011). Consequently, the abovementioned implication should support policy makers development of regulations and directives whose goal is to further connect and support supply chain engagement among the various stakeholders involved in an organization value chain. Furthermore, this manuscript underscores the importance for policy makers to establish and develop funds associated with KM diffusion and management accounting initiatives to support sustainability initiatives and foster their success.

Finally, this article highlights the significance of universities as knowledge-intensive establishments that ought to pursue knowledge-sharing endeavors aimed at advancing environmental management and conservation practices. Therefore, policymakers should promote the development of educational reforms and programs that emphasize the importance of sustainability concepts, encouraging the growth of future practitioners and academics who seek to connect the principles of KM and MAC.

6.3 | Limitations

Despite its practical and theoretical contributions, this manuscript carries a few limitations that must be acknowledged. First, the authors analyzed data obtained from online databases such as Scopus, WoS, and Google Scholar. Consequently, articles listed on other platforms and online databases were omitted. Second, this research is limited by its predefined inclusion and exclusion criteria, which restrict its database composition. Finally, the authors selected journal articles as the primary sources of information and knowledge, thereby excluding empirical findings presented and discussed in book chapters, conference proceedings, and notes.

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