Beyond sustainability: a systematic literature review on climate change through the lens of stakeholder orientation[1]

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Abstract

Frame of the research. *The escalating interest in addressing the challenges presented by climate change has led to a significant increase in research within this domain, necessitating a systematic organization. This study provides a comprehensive summary of the expanding realm of climate change research, emphasizing the progression of scholarly exploration over the past 28 years. Additionally, it underscores the importance of examining this evolution from the perspective of stakeholder orientation. This focus is crucial given that stakeholders represent one of the primary forces compelling companies to undertake climate change initiatives.*

Purpose of the paper. *The purpose of this study was twofold. First, it sought to delineate the intellectual structure of recent climate change management literature. This involved identifying the core themes and dynamic trends that characterize the current state of research in this field. Second, the study aimed to ascertain the primary stakeholders targeted by climate change strategies. By measuring the breadth and depth of firms' sustainability efforts, it endeavoured to pinpoint and understand the key stakeholder groups that are integral to the deployment of climate change strategies.*

Methodology*. This comprehensive analysis scrutinized 495 scholarly articles published in leading business management journals from 1995 to 2023. The study aimed to dissect the intellectual framework underpinning contemporary climate change management research, utilizing the Bibliometrix tool for this purpose. To assess the breadth and depth of firms' sustainability initiatives, a detailed content analysis was performed on the amassed documents, employing the MAXQDA software for rigorous examination.*

Results*. The findings indicated that the United States, Great Britain, and Australia are leading the charge in climate change research. Key milestones in the field were reached in 2012, 2018, and 2023, marking significant progress in understanding and addressing climate change. Currently, the focal points of research are shifting towards sustainable finance and the assessment of carbon risk, reflecting the evolving priorities in addressing climate change challenges. Finally, depth and breadth metrics revealed a nuanced understanding of stakeholder orientation with climate change strategies.*

Research limitations. *The limitations of this study deserve careful consideration for future research. First, the complex nature of climate change as a global challenge transcends disciplinary boundaries, making a purely management-focused approach potentially narrow. Second, the lexicon used to outline climate change strategies is in a state of continuous evolution, and the terminology and concepts that define these*

strategies are likely to expand and change. Finally, while the study used metrics to assess the breadth and depth of companies' sustainability efforts, there is an opportunity to improve this analysis through the development of a standardized index.

Managerial implications. *Bridging the gap between climate change challenges and managerial strategies, this review equips organizations with a strategic framework to enhance their sustainability efforts in alignment with stakeholder expectations.*

Originality of the paper*. This systematic literature review is pioneering in its comprehensive examination of climate change within the management literature, offering a unique lens through which to evaluate the integration of sustainability into business strategies. By mapping thematic evolution and identifying emerging trends, the review provides new insights into aligning business practices with stakeholder expectations. Moreover, this study represents the first effort to investigate the intricate intersection between climate change and firms' stakeholder orientation, by measuring the breadth and depth of firms' sustainability efforts.*

Key words: *climate change; systematic literature review; stakeholder orientation; sustainability*

1. Introduction

Climate change is the greatest (Rainard *et al.*, 2023) and most urgent (Falk *et al.*, 2024) challenge facing humanity. The term 'climate change' was delineated from former article 1 of the United Nations Framework Convention on Climate Change as *'any change in climate attributed directly or indirectly to human activities, which alters the composition of the atmosphere worldwide and adds to the natural climate variability observed over comparable time periods*' (Bodansky, 1993). The distinction between 'climate variability' and 'climate change' becomes apparent through this definition (Ghil and Lucarini, 2020). Climate variability is the result of natural fluctuations that are unaffected by human activities. In this sense, it is contingent upon temporary and localised natural factors such as shifts in oceanic conditions and solar activity.

Meanwhile, climate change is primarily driven by anthropogenic factors. For instance, one contributing factor is the emission of greenhouse gases from companies. Consequently, it can be characterised as a complex phenomenon owing to the intricate interplay of numerous interconnected variables, each contributing to the overall impact of change.

The global debate on climate change, characterized by increasing droughts, accelerating biodiversity loss, land degradation, and the imminent collapse of food systems, has gained ever more pressing relevance, becoming a central topic in the daily conversations of leaders globally.

In response to the growing need to address the climate issue, significant interest has developed over time from the research community (Moss *et al.*, 2010). This interest has given rise to a series of perspectives through which scholars have explored the topic in depth.

Meyer (1995) explored the economic implications of climate change, providing insights into mitigation benefits, costs, policy choices under

uncertainty, and alternate policy response mechanisms that influence climate change policies at domestic and international levels. Renukappa, Akintoye, Egbu, and Goulding (2013) highlighted the importance of integrating climate change and carbon management into business models. Dahlmann, Branicki, and Brammer (2019) explored the role of corporate climate change goals in shaping their emissions trends, distinguishing between symbolic and substantive commitments to reduce environmental impacts. Ponte (2020) discussed how leading companies in value chains address sustainability issues as a key competitive element and source of value creation, suggesting a process of *'green capital accumulation'*. Ghadge, Wurtmann, and Seuring (2020) identified sources, consequences, and control mechanisms of climate change risks in global supply chains. Using the framework of Drucker's Business Theory, Laszlo, Cooperrider, and Fry (2020) argued that global challenges such as pandemics and climate change offer businesses the opportunity to better align with the needs of society. Littlewood, Decelis, Hillenbrand, and Holt (2018) examined the importance of business drivers, sustainability factors, and stakeholder pressure in motivating corporate commitment to climate change action. These studies offer a range of perspectives on how businesses respond to climate change, from managing carbon emissions and risks in supply chains to leveraging global challenges in transformative business models. They provide valuable insights into the evolving landscape of business and management research in the context of climate change, helping to paint a complex and detailed picture.

Considering that a *Systematic Literature Review* (SLR) is vital in academic research because it helps gather current information and analyse the state of the art in that specific issue (Kunisch *et al.*, 2018), the primary objective of this paper was to organise the managerial literature on climate change to comprehend its current state and thematic evolution and suggest directions for future studies.

Second, the integration of climate change into business practices extends beyond the operational aspects of sustainability. Numerous studies (e.g. Vieira, Stewart, Lamberts, and Beal (2020), Shackleton *et al.* (2019), Corfee-Morlot, Cochran, Hallegatte, and Teasdale (2011)) have highlighted the evolving expectations of businesses to not only address climate change proactively but also to engage stakeholders in meaningful dialogue and action. Thus, this study aimed to explore the various dimensions related to climate change, offering a significant contribution to understanding the phenomenon from a new perspective: the stakeholder perspective. In fact, given that companies are committed to addressing environmental challenges due to pressure from stakeholders (Kölbel *et al.*, 2020), we decided to understand which categories of stakeholders the research has focused on when implementing strategies on climate change.

To achieve these ambitious objectives, this study adopted a mixed methods approach, blending qualitative and quantitative methodologies.

To establish a comprehensive framework and offer a panoramic view of how climate change is addressed in the managerial literature, we utilised Bibliometrix, an advanced bibliometric analysis tool (Aria and Cuccurullo, 2017). This platform enabled us to perform precise data collection and

analysis by reviewing over 400 articles published between 1995 and 2023. This extensive temporal analysis provides insights into the evolution of managerial literature concerning climate change.

Subsequently, we explored how this perspective intersects with corporate stakeholder orientation through content analysis. In particular, all the papers under observation were questioned by the MAXQDA program to better understand the latent features of each study, namely, the relationship between the climate change call to action and the stakeholders. Then, by inheriting breadth and depth measures from the literature (Vurro and Perrini, 2011), we evaluated the direction of firms' sustainability efforts in response to stakeholder pressure on climate change. Depth measures the average volume of strategies related to climate change and is mentioned in the document with reference to the stakeholder categories recognised in the literature: shareholders, human resources, managers, competitors, customers, providers, institutional investors, non-governmental organisation (NGO), local communities, and the environment. While breadth measures the variety of climate change aspects included in a document, it is also observed through the lens of stakeholder orientation.

In essence, this research bridges the gap between climate change and management, offering organisations a roadmap for navigating the evolving landscape of environmental management.

There is a call to action to address the urgent challenges of climate change and to contribute to a more sustainable future through tailored recommendations for management professionals.

2. Review structure and methodology

The systematic literature review approach is distinguished by its structured, transparent, and replicable procedure (Centobelli *et al.*, 2020). This methodology empowers researchers to meticulously investigate specific research questions and ensure the execution of a robust and methodological research process. The review process was organised into four distinct phases, each contributing to a comprehensive analysis of the existing literature (Fink, 2019):

1. Selection of research questions and methodological approach: In the initial phase, the research questions were meticulously crafted, and suitable bibliographic databases were chosen.
2. Definition of inclusion/exclusion criteria: This phase involved the formulation of rigorous criteria for the inclusion or exclusion of pertinent literature, while maintaining review integrity.
3. Development and implementation of a methodological review protocol: A structured review protocol was created and executed to establish a standardised methodology for a systematic understanding of the phenomenon.
4. Summary of results: The results of this systematic review were succinctly summarised, offering a comprehensive and coherent overview of the findings.

To comprehensively understand the multifaceted nature of climate change and its impact on organisations and stakeholders, we identified the following research questions (RQs) (phase 1).

First, while numerous studies have explored climate change and its risks across various sectors (Ghadge *et al.*, 2020; Ng *et al.*, 2018; Nikolaou *et al.*, 2016) and organizational responses to these changes (e.g., Nema *et al.*, (2012)), a systematic approach to organizing this knowledge, particularly regarding its intellectual structure, remains absent.

Hence, we stated the following research question:

RQ1: What is the intellectual structure of recent climate change management literature?

This study aimed to uncover the foundational elements of climate change management research, emphasising the identification of predominant themes and dynamic trends shaping the field. By synthesising the existing literature, this investigation provides a comprehensive understanding of the key issues and evolving trajectories in climate change management.

Second, in an evolving landscape, it is crucial to understand the key stakeholders to whom climate change strategies are directed. As companies increasingly recognise the critical role of environmental management in their operational and strategic frameworks, identifying and engaging key stakeholders has become a central concern. Sprengel and Busch (2011) provided a fundamental understanding of how stakeholder pressures influence the formulation of environmental strategies, with a particular focus on climate change. Expanding the dynamics between environmental strategies and stakeholder management, Buysse and Verbeke (2003) demonstrated that more proactive environmental strategies are associated with broader and deeper stakeholder coverage. Their empirical analysis indicated that companies with global environmental strategies tend to engage with a broader range of stakeholders, highlighting the importance of inclusiveness in stakeholder management practices. Further complicating the stakeholder landscape, Haigh and Griffiths (2009) argued for recognition of the natural environment as the primary stakeholder in the context of climate change. Research question 2 (RQ2) sought to delve deeper into this critical area by investigating the key stakeholders targeted by companies' climate change strategies:

RQ2: Towards which stakeholders are climate change strategies primarily targeted?

This question investigated the primary stakeholders to whom the climate change strategies were directed. By assessing the breadth and depth of sustainability efforts, this study seeks to identify and understand the primary stakeholders central to the implementation of climate change strategies within firms' organizational frameworks.

The first research question (RQ1) lends itself to a scientific mapping approach that enables visualisation of the structure and interrelationships within the scientific literature of a specific field.

Meanwhile, RQ2 is better suited for investigation through qualitative content analysis. For the scientific mapping analysis, the Bibliometrix tool (Aria and Cuccurullo, 2017; Linnenluecke *et al.*, 2020) was opted, which offers the capability to create visual representations of the research landscape in the chosen field.

To address the qualitative content analysis aspects of RQ2, MAXQDA software is known for its proficiency in analysing and interpreting textual data in a qualitative manner. This approach allowed us to leverage the strengths of both scientific mapping and qualitative content analysis techniques to comprehensively address the research questions and derive valuable insights.

The selection of papers to be investigated for research purposes was based on the following approaches (phase 2) on databases and journals (phase 3).

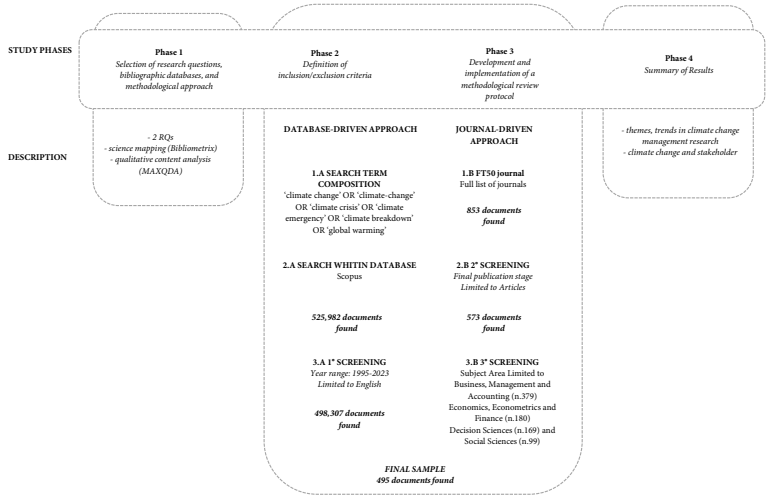
In detail, the database-driven approach was useful to identify:

- search terms criteria: 'climate change' OR 'climate-change' OR 'climate crisis' OR 'climate emergency' OR 'global warming'.
- database sources: Scopus and Ebsco host (Aguinis *et al.*, 2023)
- 1st screening criteria:
  - Timespan: 1995-2023, the authors selected 1995 as the starting point for the analysis because it was the year of the first Conference of the Parties of the UN Framework Convention on Climate Change (UNFCCC), marking the inception of the first international environmental treaty addressing global warming;
  - Language: Only English was used to prevent language bias (Stechemesser and Guenther, 2012).
- the journal-driven approach, which perfected the identification of papers with other selection criteria, such as
- source type: limited to FT50 journal,
- 2nd screening criteria:
  - publication stage: Only final papers were included, excluding articles published in the press.
  - document type: only articles were considered;
- 3rd screening criteria:
  - subject areas: Business, Management and Accounting, Economics, Econometrics and Finance, Decision Sciences and Social Sciences.

Finally, the results were synthesised (Phase 4) in alignment with the formulation and development of the research questions.

The procedure to carry out the review was structured as shown in Figure 1.

Fig. 1: The developed method in this study



Source: our elaboration

3. Results

3.1 The key themes and trends in climate change management research

Analysis of the bibliometric results began with a concise description of the main bibliometric statistics. Subsequently, the investigation delved into contextual performance before scrutinising the primary themes and trends in the field of climate change management. A literature review was conducted on 495 papers published between 1995 and 2023. The articles were written by 1197 authors, of which only 97 were single authors. Table 1 summarises the main information from the collection.

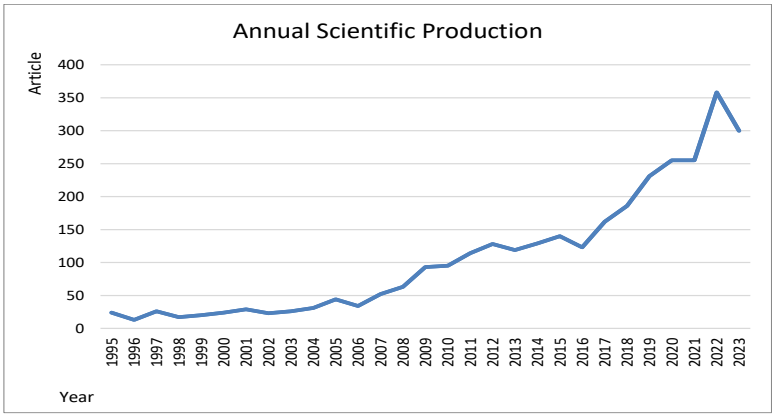
Tab. 1: Main information about the data collection

MAIN INFORMATION	
Timespan	1995-2023
Sources (journals, books, etc)	115
Documents	495
Annual growth rate %	16.5
Document average age	6.01
Average citations per doc	50.09
DOCUMENT CONTENTS	
Keywords plus (ID)	1103
Author's keywords (DE)	1648
AUTHORS	
Authors	1197
Authors of single-authored docs	95
AUTHORS COLLABORATION	
Single-authored docs	97
Co-authors per doc	2.69
International co-authorships %	30.57

Source: our elaboration

Regarding contextual performance in terms of growth trends related to climate change in management, it was evident that the current relevance of this topic has had a substantial impact on scientific output. There has been exponential growth in scholarly production from 1995 to 2023. The most notable years of increased publication activity were 2012 and 2018, with the highest peak occurring in 2023.

Fig. 2: Annual scientific production



Source: our elaboration

Based on the affiliation information collected from each author in the database, it was possible to identify the regions that contributed to the field from 1995 to 2023. The top 20 of the 59 affiliated countries are listed in Table 2. These countries represent 87% of global scientific production. The top three countries were the USA, with 254 papers published, the UK, with 136 papers, and Australia, with 75 papers.

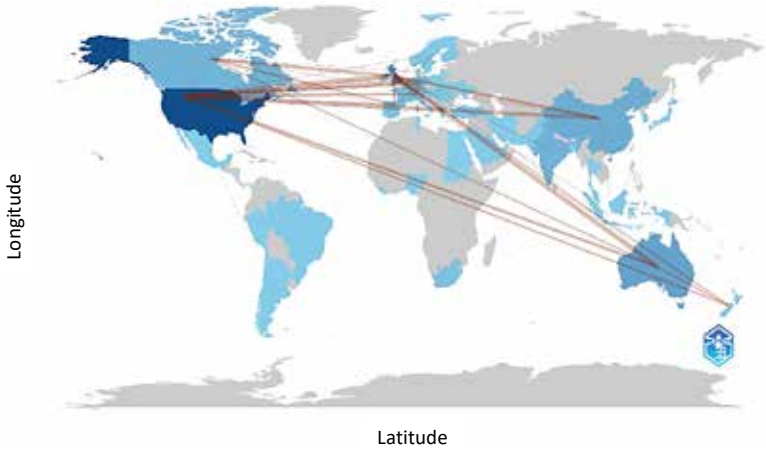
Tab. 2: Number of documents published by country

#	Region	Freq	#	Region	Freq
1	USA	254	11	ITALY	22
2	UK	136	12	SOUTH AFRICA	22
3	AUSTRALIA	75	13	SPAIN	17
4	CHINA	69	14	SOUTH KOREA	15
5	CANADA	46	15	MALAYSIA	14
6	INDIA	45	16	IRELAND	12
7	GERMANY	40	17	BRAZIL	11
8	SWITZERLAND	33	18	NEW ZEALAND	11
9	FRANCE	26	19	BELGIUM	10
10	NETHERLANDS	23	20	FINLAND	10

Source: our elaboration

As the contributions from the USA, UK, and Australia were the highest, theoretically, it was expected that collaboration among researchers in these countries would be the highest. This expectation is confirmed in Figure 3.

Fig. 3: Country collaboration map



Source: our elaboration

Table 3 presents an overview of the most frequently used keywords across the four categories: keywords plus, authors' keywords, words within titles, and words found in abstracts. Keywords plus refer to words or phrases commonly found in the titles of references cited within an article, but not within the article's title. This differentiates them from the authors' keywords, words in titles, and words in abstracts, which are selected by the authors of the respective papers. In bibliometric analysis, Bibliometrix creators regard keyword plus as significant because the authors' keywords are not always explicit enough to convey the core content of an article.

Nevertheless, the keywords selected by the authors also hold value. As expected in an analysis centred on climate change, words such as 'climate change' and 'climate' were prominently featured in all four types of words examined. The concepts of 'management' and 'environmental management' were also recurrent across all dimensions studied.

Interestingly, the most frequently recurring words in each of the four categories were related to sustainability management strategies. Keywords plus, for instance, alluded to the more societal aspect of sustainability, as evidenced by the frequency and intensity of words associated with this aspect, such as 'human', 'humans', 'decision making', 'fame', 'adult', 'male', and 'workplace'. On the other hand, authors' keywords were primarily linked to the environmental facet of sustainability, with terms like 'safety climate', 'adaptation', 'energy efficiency', 'environmental management', 'LCA' (Life Cycle Assessment), and 'circular economy'.

The words used in titles appeared to be more attention-grabbing and were often associated with corporate-level content, thus reflecting the governance of sustainability. Examples included the use of the word 'performance' (absent in the other categories), as well as 'industry', 'corporate', 'company', and 'firm'. Finally, the keywords most frequently adopted by the authors in abstracts seemed to strike a balance among all three dimensions of sustainability.

Tab. 3: Most frequently used keywords

Keywords+	Freq.	Authors' Keywords	Freq.	Titles	Freq.	Abstract	Freq.
climate change	1001	climate change	379	climate	729	climate	5443
article	370	sustainability	139	management	593	management	4171
sustainable development	300	safety climate	94	change	298	study	3240
human	287	sustainable development	84	performance	269	companies	2859
environmental management	286	innovation	73	study	266	change	2548
global warming	223	adaptation	58	carbon	265	environmental	2403
risk assessment	199	corporate social responsibility	58	environmental	258	energy	2002
decision making	198	management	51	safety	249	research	1998
emission control	184	energy efficiency	44	energy	220	results	1915
humans	183	environmental management	44	industry	217	safety	1889
sustainability	179	life cycle assessment	42	corporate	214	firms	1834
environmental impact	175	risk management	40	development	166	performance	1800
carbon dioxide	168	organizational climate	38	analysis	165	carbon	1725
carbon	162	environmental performance	37	sustainable	160	paper	1605
female	152	global warming	37	companies	158	data	1541
China	146	environment	36	green	157	analysis	1352
greenhouse gases	146	carbon footprint	35	risk	156	development	1343
adult	142	knowledge management	35	assessment	153	model	1332
male	142	circular economy	34	organizational	150	emissions	1283
energy efficiency	138	China	32	role	147	water	1273
united states	135	greenhouse gas emissions	32	innovation	144	impact	1215
carbon emission	131	supply chain management	32	supply	144	business	1163
workplace	131	safety culture	31	sustainability	143	company	1161
industry	130	carbon emissions	30	firms	135	organizational	1124
greenhouse gas	126	leadership	29	impact	133	risk	1115

Source: our elaboration

The matrix in Figure 4 presents a thematic map generated from the keywords and papers. This figure is significant to the analysis because it visually represents how the concept of climate change aligns with emerging or waning themes in the field of management.

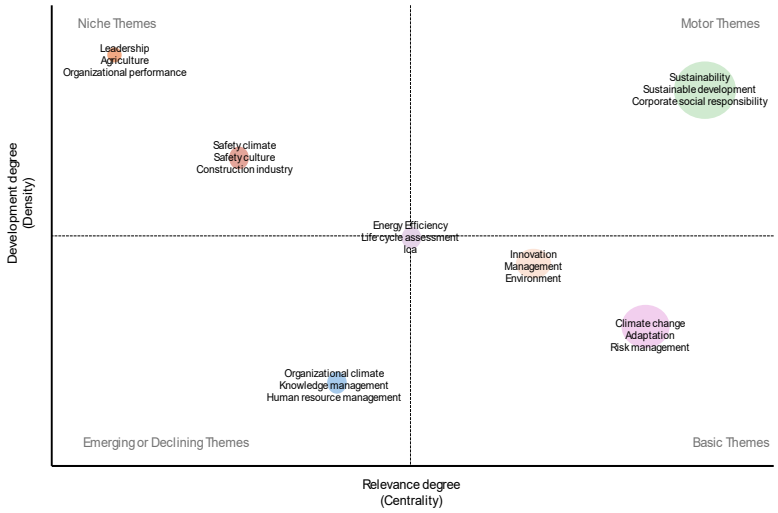
The matrix revealed the presence of seven distinct theme clusters: safety, organizational, sustainability, energy efficiency, leadership, innovation, and climate change. These themes were subsequently arranged based on two key variables: centrality, which reflects their level of relevance, and density, which signifies their degree of development.

In the upper part of the matrix, on the left side, the highly developed (niches) themes were presented. Here were listed the keywords linked to 'leadership', 'agriculture', and 'organizational performance'. On the

right side, 'sustainability', 'sustainable development', and 'corporate social responsibility' were the keywords presented as motor themes. Down on the right side, there were keywords presented as basic themes, namely 'climate change', 'adoption', and 'risk management'. On the bottom left side, emerging or declining themes were displayed: 'organizational climate', 'knowledge management', and 'human resource management'.

Certain keywords were positioned along the left diagonal of the matrix, particularly those associated with safety and innovation themes, albeit with varying degrees of density and centrality. Of particular significance was the theme centred around the terms 'energy efficiency' and 'LCA', which stood out as a highly central focus.

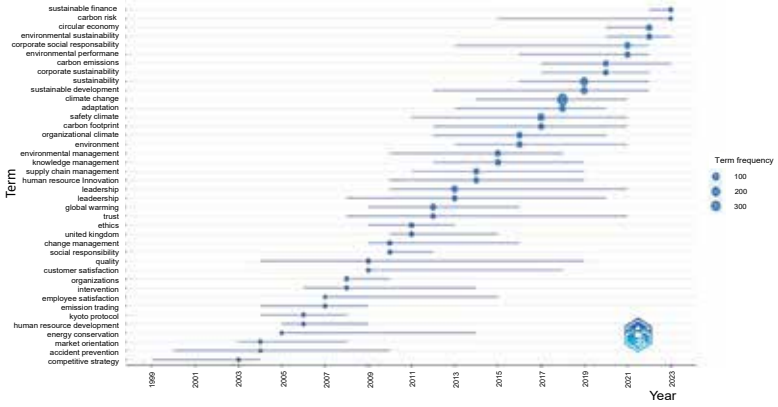
Fig. 4: Thematic map of the keywords plus of the papers



Source: our elaboration

Figure 5 precisely illustrates the temporal evolution of trends in climate change studies. It is evident that the discourse on climate change has shifted over time. Around the turn of the millennium, terms such as 'competitive strategy', 'accident prevention', and 'market orientation' were prevalent. Subsequently, between 2010 and 2015, the terms most frequently used by authors were 'social responsibility', 'change management', and 'leadership'. Subsequently, the trend transitioned to themes related to 'adaptation', 'sustainable development', and 'environmental performance'. Meanwhile, topics of utmost relevance associated with the years 2021-2023 were linked to 'carbon risk' and 'sustainable finance'.

Fig. 5: Keywords trend topic



Source: our elaboration

3.2 The stakeholders and climate change strategies

A methodological framework was meticulously crafted to identify the primary stakeholders targeted by the climate change strategies. The initial steps involved the identification of overarching categories capable of capturing the spectrum of strategies associated with climate change, culminating in the delineation of four macro classes: *mitigation strategies, adaptation strategies, corporate and organizational strategies, and political and regulatory strategies.*

Mitigation strategies are characterised by specific criteria directed at elucidating interventions designed to curtail greenhouse gas emissions and alleviate the impacts of climate change (Cadez *et al.*,2019). Conversely, *adaptation strategies* shed light on measures intended to enhance organisational resilience against current and anticipated impacts of climate change (Ortiz-de-Mandojana and Bansal, 2016). The category of *corporate and organizational strategies* is defined through a comprehensive analysis of the initiatives and internal policies adopted by firms to integrate sustainability and address climate change concerns. Finally, *political and regulatory strategies* involve identifying pertinent government policies, laws, and regulations pertaining to sustainability and climate change.

Following the identification of these macro-classes, specific keywords were meticulously defined for each strategy category, serving as critical indicators during subsequent content analysis. For example, keywords associated with mitigation strategies may encompass terms such as 'carbon reduction' and 'renewable energy'.

A compilation of these keywords formed the basis for developing the vocabulary presented in Table 4.

Furthermore, to enhance methodological rigor, a comprehensive examination of widely cited sources pertaining to climate change was undertaken. Noteworthy websites, such as the Paleontological Research Institution[2], the State of the Climate del National Oceanic and Atmospheric

[2] PRI. the Paleontological Research Institution. https://www.priweb.org/.

Administration[3], the World Bank Group Climate Change Knowledge[4], and the NASA Climate Portal[5], were meticulously reviewed.

At this stage, content analysis was conducted to examine the language, lexicon, and expressions most often used in the literature to connect stakeholders with climate change strategies. The volume of content analysis data is generally large and qualitative data analysis software can simplify the analysis process. In this study, we used MAXQDA 2020 software, which offers valuable data management and analysis support to the researcher (Oliveira *et al.*, 2013).

The software made it possible to query the text content of the research papers and explore the data, as well as analyse the interrelationships between the words in the vocabularies constructed to define climate change strategies and stakeholder categories. Thus, all papers were first coded according to the stakeholder categories identified widely in the literature: shareholders, human resources, managers, competitors, customers, providers, institutional investors, ONG, local communities, and the environment. Individual codifications were then investigated based on vocabularies for climate change strategies. This process allowed us to understand the researchers' orientation in terms of climate change strategies toward all stakeholder categories.

Tab. 4: The vocabulary of climate change strategies

CLIMATE CHANGE STRATEGIES	KEYWORDS
Mitigation Strategies	afforestation, biomass energy, carbon capture, carbon storage, carbon offset, carbon pricing, carbon reduction, clean energy, climate-friendly practices, decarbonisation, emission reduction, energy efficiency, energy conservation, geothermal energy, green building practices, green technology, hydropower, land use, low-carbon, nuclear energy, recycling, reforestation, renewable energy, renewable energy adoption, social innovation, solar energy, solid waste, sustainable agriculture, sustainable transportation, transportation, waste management, wind power
Adaptation Strategies	adaptive agriculture, biodiversity preservation, climate management, climate resilience, climate risk management, climate-informed urban planning, climate-proofing, climate-resilient infrastructure, climate-responsive infrastructure, coastal management, coastal protection, conserve natural systems, crop and livestock diversity for agriculture, disaster preparedness, disaster risk, disaster risk preparedness, disaster risk reduction, disease management, diversify, drought management, ecosystem-based adaptation, flood control, health management, heat resilience, make land use changes, modify management, modify operations, policy changes, relocate, renew natural systems, resilient communities, retreat, water resource management
Corporate and Organisational Strategies	carbon footprint reduction, carbon footprint , circular economy, corporate social responsibility, eco-friendly business, environmental management, environmental management systems, environmental responsibility, green procurement policies, green supply chain, iso, stakeholder engagement, supply chain sustainability, sustainability disclosure, sustainability performance, sustainability practices, sustainability reporting, sustainable operations, sustainable procurement, sustainable product design, sustainable product design sustainable product manufacturing
Policy and Regulatory Strategies	cap-and-trade, carbon market regulations, carbon taxation, clean energy incentives, climate action plans, climate adaptation policies, climate regulations, climate resilience policies, emission reduction, emission reduction regulations, emission reduction targets and regulations, emission targets, energy efficiency regulations, environmental legislation, incentives for renewable energy and energy efficiency, international agreements and treaties, international climate agreements, international treaties, Paris agreement, renewable energy policies

Source: our elaboration

[3] NOAA. National Oceanic and Atmospheric Administration - State Climate. https://www.ncdc.noaa.gov/sotc/.

[4] https://climateknowledgeportal.worldbank.org/

[5] NASA. Global Climate Portal (NASA). https://climate.nasa.gov/evidence/.

Thus, the results obtained from this analysis were used to operationalise the depth and breadth variables (Vurro and Perrini, 2011a). Depth corresponds to the average volume of climate change aspects (keywords) mentioned in the document. It is given by the sum of the climate change aspects related to each stakeholder multiplied by an index that corresponds to the ratio between the total number of aspects cited for the stakeholder in all documents and the total number of climate change aspects cited with respect to all stakeholders. A weighting index was inserted to reduce the subjectivity in the choice of aspects considered in the content analysis.

Breadth corresponds to a variety of aspects related to climate change included in the document. This variable is calculated as the ratio between the total number of climate change aspects found in a single document relating to each stakeholder and the total number of climate change aspects researched in all the documents collected relating to that specific stakeholder.

The two measures, breadth and depth, were calculated for each strategy identified in Table 4, and for each of the previously indicated categories of stakeholders. Table 5 presents the results of this analysis.

Tab. 5: Breadth and depth of sustainability efforts

STRATEGIES	Adaptation		Mitigation		Corporate and Organisational		Policy and Regulatory	
MEASURES	Depth	Breadth	Depth	Breadth	Depth	Breadth	Depth	Breadth
STAKEHOLDERS								
Shareholder	0.08	1.00	1.91	6.86	2.70	8.50		
Human resources	0.03	1.00	1.31	3.55	2.02	5.45		
Manager	0.04	1.00	2.78	3.94	2.95	6.09		
Competitor	0.02	2.00	0.13	1.38	0.26	2.75		
Customer	0.49	1.33	26.73	9.86	17.86	13.18		
Provider			1.01	3.83	0.42	4.75		
Institutional investors	0.34	2.00	11.40	9.07	9.14	10.90		
Ong					0.01	2.50		
Local community	1.63	2.33	22.99	9.00	15.44	13.30		
Environment	6.81	1.86	341.69	27.17	459.08	67.38	8.39	16.00

Source: our elaboration

Table 5 outlines the depth and breadth of climate change strategies across different stakeholder categories, measured through adaptation, mitigation, corporate and organisational strategies, and policy and regulatory strategies.

What clearly emerged was that the environment was the primary focus: the highest depth and breadth scores were consistently observed in the 'environment' stakeholder category across all strategies, especially for mitigation and corporate and organisational strategies. This indicates a significant emphasis on environmental impact within climate change strategies, showcasing firms' focus on reducing their ecological footprint and directly addressing environmental sustainability.

However, there was a notable variability in how different stakeholders engage across strategies.

For instance, 'customers' and 'local community' received substantial attention in mitigation strategies that focused on engaging with external stakeholders directly affected by a firm's operations and climate change policies.

The depth and breadth scores in the corporate and organisational strategies category were high for several stakeholders, including shareholders, human resources, and managers. This suggests that internal stakeholders are crucial to the implementation of climate change strategies within firms, emphasising the role of internal policies and organisational culture in driving sustainability efforts.

Mitigation strategies had the highest depth and breadth scores across most stakeholders, indicating that firms invest heavily in efforts to reduce climate impact. This was especially true for the 'environment' category, where mitigation strategies were most pronounced, highlighting a direct response to climate change through reducing emissions and other environmental impacts.

The policy and regulatory strategies category was notably empty for most stakeholders, except for 'environment', which suggests that while firms are focusing on direct action through mitigation and adaptation, there may be less emphasis on engaging with or influencing policy and regulatory frameworks. The high scores for 'environment' in this category could imply a recognition of the importance of compliance with environmental regulations or a strategic focus on influencing environmental policy.

Finally, an analysis of the depth and breadth measures across various climate change strategies and stakeholders revealed a complex landscape of stakeholder engagement in firms' sustainability efforts. The emphasis on the environment across strategies underscores the prioritisation of direct environmental impacts in climate change initiatives. Meanwhile, the significant scores for internal and external stakeholders in certain strategies highlighted the multifaceted approach firms take to address climate change, incorporating both internal policy changes and external stakeholder engagement. This analysis suggests that successful climate change strategies require a comprehensive approach that considers a broad spectrum of stakeholders and employs various strategies to address the challenges posed by climate change.

4. Discussion and conclusion

This systematic literature review (SLR) represents a groundbreaking effort to systematically consolidate and analyse how climate change is being integrated within the domain of business and management. By adhering to a rigorous, structured, and transparent methodology, this review not only delineates the intellectual landscape of recent climate change management literature but also provides an exhaustive overview of the field's evolution and the intricate ways in which firms engage with climate change through stakeholder orientation.

Our analysis sheds light on a vibrant and expanding corpus of literature that underscores the escalating acknowledgement of climate change as a pivotal concern within the business and management spheres.

The investigation into the intellectual structure of this literature (RQ1) uncovered a diverse array of themes and trends, highlighting the complexity of the field and the multifaceted approaches organisations adopt in response to climate change. Scientific mapping has provided valuable insights into the foundational elements of climate change management research, illuminating the key issues and evolving trajectories that have shaped this critical area of study. However, the implications of the findings vary. For one, they suggest that the business and management research community is increasingly treating climate change not merely as an environmental or peripheral issue but as a central strategic concern (Ghadge *et al.*, 2020; Moshood *et al.*, 2021). Moreover, the various themes and trends identified through our SLR signal a growing consensus on the necessity of innovative, multi-stakeholder approaches to climate change strategies. These strategies aim to minimise the negative impacts and leverage opportunities for sustainable growth and competitive advantage.

Furthermore, this review highlighted the importance of an interdisciplinary approach (Schipper *et al.*, 2021) to researching climate change within the business and management context. The intricate interplay between climate change challenges and business strategies calls for a collaborative effort spanning various disciplines, including environmental science, sociology, economics, and organisational behaviour, to name a few.

In addressing the second research question (RQ2), our analysis identified the primary stakeholders targeted by climate change strategies, emphasising the significance of a broad and deep engagement with sustainability efforts. This focus underscores the vital role that stakeholders play in driving firms towards more sustainable practices, reflecting a growing awareness of the need for a collaborative approach to address the multifarious challenges posed by climate change.

The use of advanced analytical tools, such as Bibliometrix for scientific mapping and MAXQDA for content analysis, has enabled rigorous examination of the literature, facilitating a nuanced understanding of the research landscape. This approach not only enhances the robustness of our findings but also contributes to the development of a strategic compass for future research and practice in the field.

A holistic review of 495 papers from top journals published between 1995 and 2023 provided a strategic compass for navigating the evolution of climate change themes within the business and management domains.

As the first to systematically investigate the intersection between climate change and a firm's stakeholder orientation, the SLR serves as a foundational resource for scholars and practitioners. This calls for a continued and deepened focus on sustainability efforts and urges firms to adopt a proactive and inclusive approach to stakeholder engagement in the face of climate change. In conclusion, this SLR not only maps the current state of climate change research within the business and management field but also sets the stage for future investigations. This highlights the need for ongoing research to adapt and evolve in response to the changing dynamics of climate change, urging a more nuanced and comprehensive approach to understanding and addressing the implications for firms

and their stakeholders. As the field continues to grow and evolve, this study represents a critical step forward in integrating climate change considerations into business and management practices (Loureiro *et al.*, 2020).

4.1 Recommendation

These findings underscore the increasing recognition of climate change as a pivotal issue in the business and management communities, with a diverse range of themes and trends emerging from the literature. The analysis identified key stakeholders in climate change strategies and emphasised the importance of broad and deep engagement with sustainability efforts. However, the results showed that there is still scope for interventions for researchers.

The findings of the first research question reveal a varied landscape of climate change research in management, highlighting themes such as sustainability, energy efficiency, and leadership as central and well-developed. Emerging themes such as knowledge and human resource management suggest a broadening of the research focus. This diversity indicates a shift towards integrating climate change into broader management practices, underscoring the importance of multidisciplinary approaches for addressing sustainability challenges.

Given the temporal evolution of climate change studies, researchers could focus on further exploring sustainable finance and carbon risk management, emphasising the integration of climate considerations into corporate strategies and financial decision-making.

What emerges from the second research question is that the use of depth and breadth metrics allows for a nuanced understanding of stakeholder engagement. Depth, reflecting the volume of climate change aspects mentioned, and breadth, indicating the variety of aspects, together suggest that firms not only cover a wide range of topics related to stakeholders but also emphasise these topics to varying degrees. Future research should explore the dynamics between climate change strategies and a broader range of stakeholders, particularly focusing on under-researched groups, such as non-governmental organizations and the financial sector, to understand their influence on corporate sustainability efforts.

Moreover, policy and regulatory frameworks are underdeveloped; thus, it is important to examine the impact of evolving policy and regulatory landscapes on corporate climate change strategies, especially in different geographical contexts and industries. This examination sheds light on how external pressures influence corporate actions.

The following table briefly summarises the main recommendation of this study.

Tab. 6: Recommendation

Aspect	Trend	Future RQs	Practitioner Implications
Strategy	Integration of climate considerations	How can sustainable finance and carbon risk management be further integrated into corporate strategies and financial decision-making?	Firms need to embed climate change considerations into their core strategies, utilising sustainable finance and assessing carbon risks.
Stakeholder	Broad and deep engagement	How can firms enhance engagement with under-researched stakeholders like NGOs and the financial sector to influence corporate sustainability efforts?	Businesses should expand their stakeholder engagement efforts to include a wider array of stakeholders, focusing on deep and meaningful collaborations.
Mitigation Strategies	Energy efficiency, sustainability	How can organisations further develop and implement energy-efficient and sustainable practices in their operations?	Companies should prioritise energy efficiency and sustainability in their operations to mitigate their impact on climate change.
Adaptation Strategies	Developing resilience to climate impacts	What strategies can firms adopt to enhance their resilience against the adverse effects of climate change?	Organisations need to adopt and innovate adaptation strategies to safeguard their operations and supply chains against climate-related disruptions.
Corporate and Organisational Strategies	Leadership in climate initiatives	How can leadership and knowledge management be leveraged to foster a culture of sustainability within organisations?	Leadership must actively promote a culture of sustainability and innovation, integrating climate change into organisational practices and decision-making.
Policy and Regulatory Strategies	Navigating evolving landscapes	How do changing policy and regulatory landscapes impact corporate climate change strategies, especially across different geographical contexts and industries?	Firms must stay informed about and adapt to evolving policy and regulatory frameworks, ensuring compliance and leveraging these changes for strategic advantage.

Source: our elaboration

In essence, this SLR not only charts the current state of climate change research within the business and management field but also catalyses future investigations into this critical area. It advocates for a nuanced and comprehensive approach to understanding and addressing the implications of climate change for firms and their stakeholders. By emphasising the need for ongoing research and the development of flexible strategies, this review highlights the critical importance of businesses staying agile and responsive to the ever-evolving environmental challenges. Moreover, it calls for an interdisciplinary approach, incorporating insights from

finance, policy studies, human resources, and technology to foster a more robust and resilient business model that can withstand and adapt to the uncertainties presented by climate change.

This SLR emphasises the transformative shift in how businesses view their role in addressing climate change, advocating for a proactive stance that not only mitigates risks but also seizes opportunities for innovation in sustainability.

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