

MAPPING GREEN ENTREPRENEURSHIP AND SUSTAINABILITY RESEARCH: AN INTEGRATED BIBLIOMETRIC ANALYSIS AND SYSTEMATIC LITERATURE REVIEW

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Abstract

Green entrepreneurship has attracted growing scholarly attention as a strategic response to climate change, resource scarcity, and the global pursuit of the Sustainable Development Goals (SDGs). However, the existing literature remains conceptually fragmented across multiple disciplines, while studies integrating bibliometric analysis with a systematic literature review (SLR) remain limited. This study addresses this gap by mapping and synthesizing the intellectual landscape of research on green entrepreneurship and sustainability through an integrated bibliometric analysis and systematic literature review. Using the Scopus database, an initial search identified 515 documents, which were screened through four PRISMA-based stages involving document type, subject area, keyword relevance, and open-access eligibility, resulting in a final dataset of 62 peer-reviewed articles. Bibliometric analysis was conducted using Scopus Analytics and VOSviewer to examine publication trends, leading authors, subject area distribution, research themes, and international collaboration patterns. The systematic literature review employed thematic coding to synthesize how the relationship between green entrepreneurship and sustainability has been conceptualized in the existing literature. The findings indicate that scholarly output has increased substantially since 2022, reaching its highest level in 2024. Research in this field is dominated by the Business, Management, and Accounting discipline, with China and the United Kingdom emerging as the most productive contributors. Keyword co-occurrence analysis identified four major thematic clusters related to green entrepreneurship, sustainability and innovation, green entrepreneurial orientation, and the green economy. Furthermore, the country co-authorship network remains relatively sparse and fragmented, with Malaysia serving as a key bridging country. Although Indonesia has made a notable contribution in terms of publication output, its international co-authorship links remain limited, suggesting that much of its research is conducted through domestic collaboration. Overall, the findings demonstrate the multidisciplinary maturity of the field while highlighting the need for stronger international collaboration and more integrative theoretical frameworks to advance future research on green entrepreneurship and sustainability.

Keywords: Green Entrepreneurship; Sustainability; Bibliometric Analysis; Systematic Literature Review; VOSviewer.

INTRODUCTION

Green entrepreneurship has emerged as a strategic intersection between economic value creation and environmental stewardship, positioning entrepreneurs as key actors in the transition toward a more sustainable economy [1]. The concept refers to the identification and exploitation of business opportunities that generate economic value while simultaneously reducing environmental harm and promoting ecological well-being [2]. Against the backdrop of accelerating climate change, resource scarcity, and the global commitment to the Sustainable Development Goals (SDGs), green entrepreneurship is increasingly recognized as a practical pathway for embedding sustainability principles into business activities [3,4]. Consequently, scholarly interest in the relationship between green entrepreneurship and sustainability has expanded rapidly across the fields of business, management, environmental science, economics, and innovation studies [5].

Despite this growing body of literature, research on green entrepreneurship and sustainability remains conceptually fragmented and dispersed across multiple disciplines and theoretical perspectives [6]. Existing studies have provided valuable insights into various aspects of the field; however, important methodological limitations remain. Bibliometric studies have primarily focused on publication performance, citation patterns, keyword co-occurrence, and collaboration networks, offering a

descriptive overview of the evolution of the research domain [5]. While these studies effectively reveal the intellectual structure of the field, they provide limited explanation of how green entrepreneurship contributes to sustainability or how major concepts have evolved theoretically. Conversely, systematic literature reviews have synthesized conceptual and empirical findings but generally lack quantitative evidence regarding research performance, thematic evolution, and international collaboration. As a result, previous studies have tended to examine either the quantitative structure or the qualitative content of the literature separately, leaving an incomplete understanding of the overall intellectual landscape.

This methodological separation represents an important research gap. Integrating bibliometric analysis with a systematic literature review enables researchers to combine quantitative mapping of scientific production with qualitative thematic synthesis, thereby providing a more comprehensive understanding of the field than either approach can achieve independently. Bibliometric analysis identifies publication trends, influential authors, dominant subject areas, collaboration networks, and thematic structures, whereas a systematic literature review synthesizes how concepts, theories, and empirical findings have developed across the literature. The integration of these complementary approaches therefore offers a more robust and reliable assessment of the current state of knowledge.

The novelty of this study lies in its integrated methodological framework, which combines bibliometric performance analysis, science mapping, and systematic thematic synthesis within a single research design. Unlike previous studies that employed only one methodological approach, this study simultaneously maps publication trends, identifies the intellectual and collaborative structure of the field, and synthesizes the dominant conceptualizations of the relationship between green entrepreneurship and sustainability. By integrating quantitative and qualitative evidence, this study provides a more comprehensive understanding of the intellectual landscape while identifying emerging research directions and theoretical gaps for future investigation.

Accordingly, this study aims to map and synthesize the intellectual landscape of research on green entrepreneurship and sustainability through an integrated bibliometric analysis and systematic literature review. Specifically, the study addresses three research questions:

- **RQ1:** How has research on green entrepreneurship and sustainability developed in terms of publication trends, leading authors, and subject areas?
- **RQ2:** What are the dominant research themes and international collaboration patterns in this field?
- **RQ3:** How does the literature conceptualize the relationship between green entrepreneurship and sustainability, and what research gaps and future directions emerge?

To answer these questions, RQ1 is addressed through bibliometric performance analysis using Scopus Analytics, RQ2 through science mapping using VOSviewer, and RQ3 through qualitative thematic coding within a systematic literature review. This integrated analytical framework ensures that the study captures both the quantitative evolution and the qualitative development of research on green entrepreneurship and sustainability.

The remainder of this paper is organized as follows. The next section describes the data sources, search strategy, and analytical procedures. The Findings and Discussion section presents the results of the bibliometric analysis and thematic synthesis. Finally, the Conclusion summarizes the main contributions of the study, discusses its limitations, and outlines directions for future research.

METHODS

This study employed an integrated research design combining bibliometric analysis and a systematic literature review (SLR). The bibliometric component was used to examine the performance and intellectual structure of the research field (RQ1 and RQ2), while the SLR provided an in-depth thematic synthesis of the selected studies to address RQ3. The review process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines

(Page et al., 2021), ensuring a transparent, systematic, and reproducible procedure for identifying, screening, and selecting relevant publications).

The Scopus database was selected as the sole data source because of its comprehensive coverage of peer-reviewed literature in business, management, entrepreneurship, and sustainability research. The literature search was conducted using the following query:

TITLE-ABS-KEY ("green entrepreneurship" OR "green entrepreneur") AND ("sustainability" OR "sustainable development" OR "sustainable entrepreneurship")

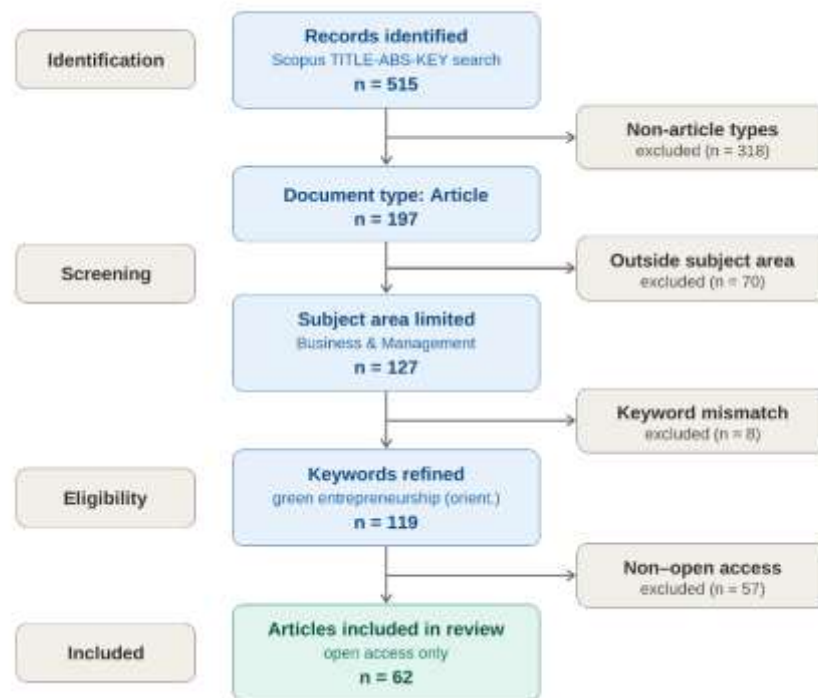


Figure 1. Systematic literature review information flow using PRISMA

In the first stage, the search results were limited to the document type "Article", reducing the dataset from 515 to 197 documents by excluding conference papers, book chapters, review articles, and other publication types. In the second stage, the subject area was restricted to Business, Management, and Accounting, resulting in 127 documents. The third stage refined the dataset by retaining only studies containing the keywords "green entrepreneurship" **or** "green entrepreneurial orientation," leaving 119 documents. Finally, the dataset was limited to **open-access** publications, yielding a final corpus of 62 peer-reviewed articles.

The decision to include only open-access articles was made to ensure unrestricted access to complete full-text publications required for qualitative thematic coding during the systematic literature review. Full-text accessibility was essential for maintaining consistency, transparency, and analytical rigor throughout the thematic synthesis. Nevertheless, this criterion may have introduced selection bias by excluding relevant subscription-based studies that could also contribute to the understanding of green entrepreneurship and sustainability. Therefore, this limitation should be considered when interpreting the findings, and future studies are encouraged to include both open-access and subscription-based publications to provide a more comprehensive representation of the literature.

The analysis was conducted through two complementary stages. To address RQ1, Scopus Analytics was used to examine publication trends, leading authors, subject area distribution, and country productivity over the 2018–2026 period. To address RQ2, VOSviewer (van Eck & Waltman, 2010) was employed to construct keyword co-occurrence and country co-authorship networks, enabling the identification of dominant research themes and international collaboration patterns. Finally, to address **RQ3**, the 62 selected articles were analyzed using qualitative thematic coding to synthesize how the literature conceptualizes the relationship between green entrepreneurship and sustainability, while also identifying major research gaps and future research directions.

FINDINGS AND DISCUSSION

Publication Performance (RQ1)

The first research question examines the performance of research on green entrepreneurship and sustainability by analyzing publication trends, leading authors, disciplinary distribution, and country productivity. Bibliometric performance analysis provides an overview of the evolution of the field and identifies the principal contributors to its development. The results are presented in Figures 2–5.

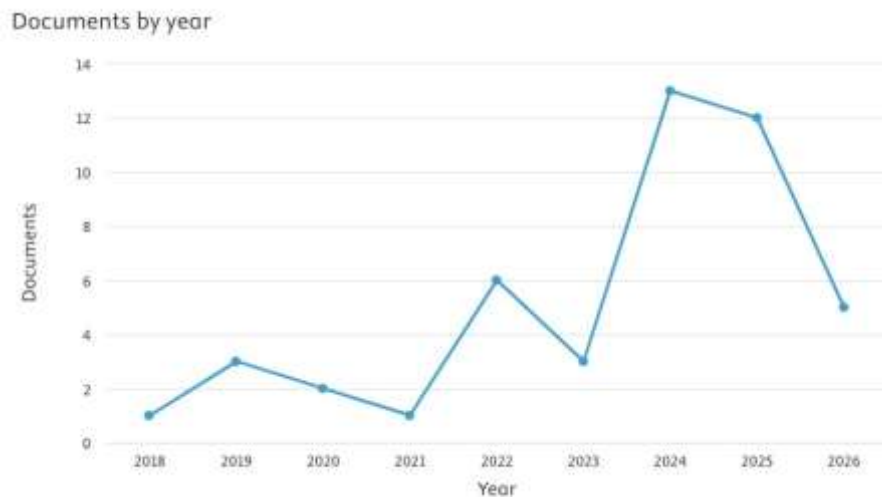


Figure 2. Annual distribution of publications, 2018–2026

Figure 2 illustrates a clear upward trend in publications on green entrepreneurship and sustainability between 2018 and 2026. The field developed gradually during its early stages, with only one publication recorded in 2018, followed by three publications in 2019, two in 2020, and one in 2021. Beginning in 2022, however, research activity increased substantially, culminating in a peak of 13 publications in 2024, followed by 12 publications in 2025. The lower number of publications recorded for 2026 should be interpreted cautiously, as data collection was conducted before the completion of the publication year.

The rapid increase in publications after 2022 reflects the growing recognition of green entrepreneurship as a strategic mechanism for addressing environmental challenges while maintaining economic competitiveness. This trend also coincides with the increasing global emphasis on Environmental, Social, and Governance (ESG) principles, circular economy initiatives, carbon neutrality commitments, and the Sustainable Development Goals (SDGs). Consequently, researchers have increasingly shifted their attention from conventional entrepreneurship toward entrepreneurial strategies capable of generating both economic and environmental value.

Documents by subject area

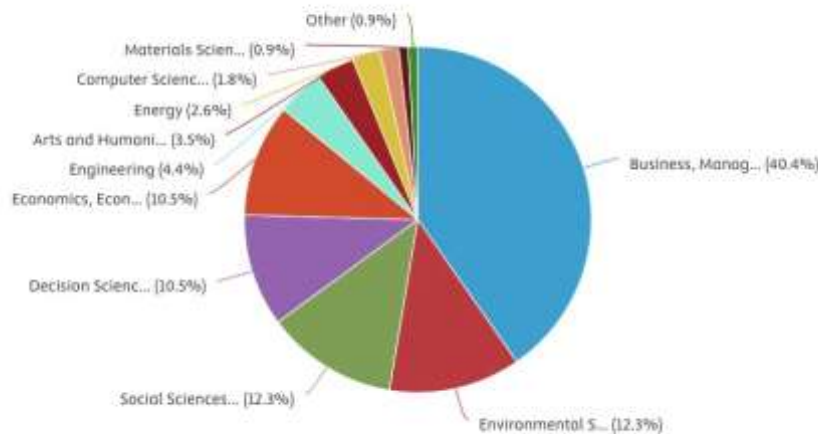


Figure 3. Documents by Author

Figure 3 presents the most productive authors in the field based on the Scopus database. The distribution indicates that research productivity remains relatively dispersed, with no single author dominating the literature. Instead, knowledge development has been driven by contributions from multiple research groups across different countries. This pattern suggests that green entrepreneurship is still an emerging multidisciplinary field characterized by diverse theoretical perspectives rather than a mature discipline dominated by a small number of influential scholars. Such diversity contributes positively to knowledge development by encouraging conceptual innovation and interdisciplinary collaboration.

Figure 4. Distribution of Documents by Subject Area

As illustrated in Figure 4, Business, Management, and Accounting represents the largest subject area, accounting for 40.4% of the publications. Environmental Science and Social Sciences each contribute 12.3%, followed by Decision Sciences and Economics, Econometrics and Finance, both at 10.5%. Smaller contributions originate from Engineering, Arts and Humanities, Energy, Computer Science, and Materials Science.

This disciplinary distribution demonstrates that green entrepreneurship has evolved into a genuinely multidisciplinary research domain. Nevertheless, the dominance of Business, Management, and Accounting confirms that green entrepreneurship is primarily conceptualized as a strategic business approach for achieving sustainable competitive advantage rather than solely as an environmental or technological issue. The increasing participation of environmental and engineering disciplines also reflects the growing integration of technological innovation and sustainability into entrepreneurial research, indicating a gradual convergence between management, environmental science, and innovation studies.

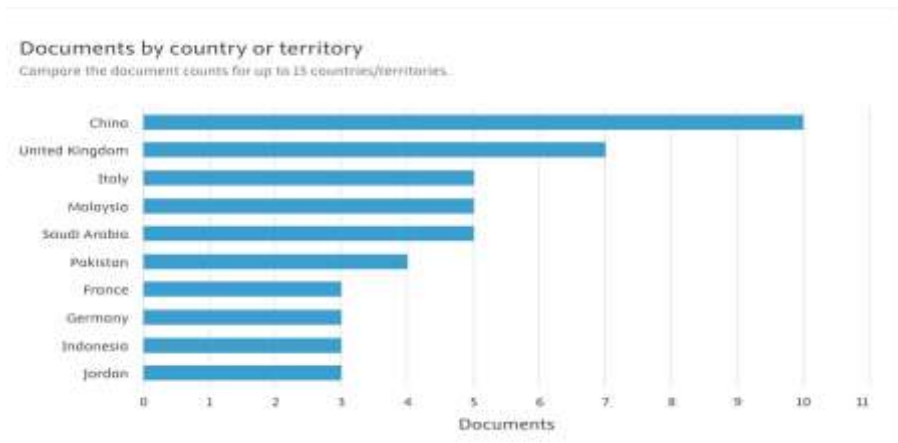


Figure 5. Most productive countries or territories

Figure 5 presents the geographical distribution of research productivity. Before interpretation, it is important to ensure that the document counts reported in the figure, accompanying narrative, and subsequent tables are fully consistent. If differences arise, they should be explicitly explained as resulting from different analytical procedures, such as publication productivity analysis versus VOSviewer network thresholding.

Overall, the geographical distribution demonstrates that green entrepreneurship has become a global research agenda extending beyond developed economies. China's leading position reflects its sustained policy commitment to green transformation, technological innovation, and sustainable industrial development. Meanwhile, the United Kingdom continues to play an important role through its strong research capacity and long-standing contribution to sustainability scholarship. Emerging economies—including Malaysia, Saudi Arabia, Pakistan, Indonesia, and Jordan—have also become increasingly active contributors, indicating that green entrepreneurship is recognized as an important strategy for balancing economic development with environmental sustainability across diverse national contexts.

Taken together, the publication performance analysis confirms that research on green entrepreneurship and sustainability has entered a period of rapid expansion. The increasing publication output, broad disciplinary participation, and wider geographical distribution indicate that the field has progressed from an emerging research topic to a mature multidisciplinary domain with growing theoretical and practical significance.

Science Mapping (RQ2)

The second research question examines the intellectual structure of green entrepreneurship and sustainability research by analyzing keyword co-occurrence and international co-authorship networks.

Science mapping was conducted using VOSviewer to identify dominant research themes, conceptual relationships, and collaboration patterns among countries. The findings provide insights not only into the

evolution of the research field but also into its theoretical development and global knowledge network.

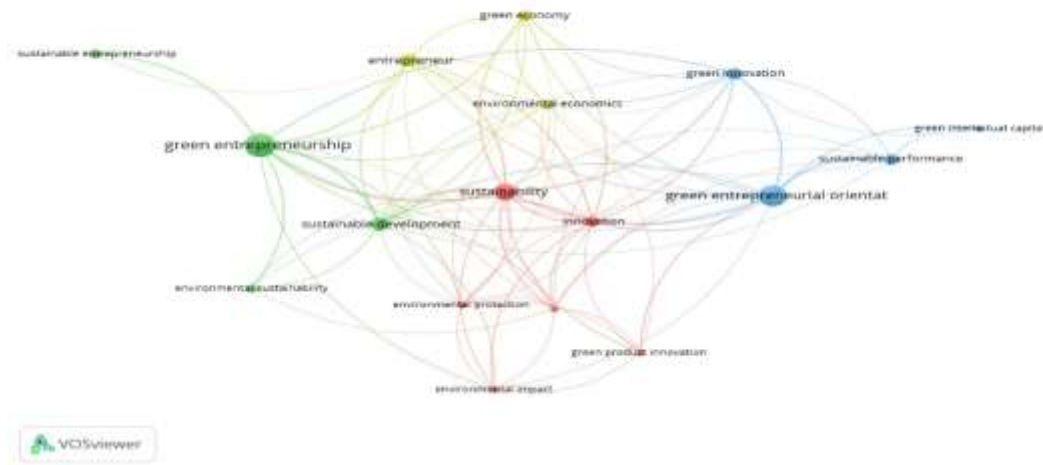


Figure 6. Keyword co-occurrence network

Figure 6 presents the keyword co-occurrence network, which reveals four major thematic clusters representing the intellectual structure of research on green entrepreneurship and sustainability.

The **first cluster** (green) is centred on *green entrepreneurship*, which appears as the largest and most influential node in the network. This cluster is strongly connected with *sustainable development*, *sustainable entrepreneurship*, and *environmental sustainability*, indicating that green entrepreneurship has become the central concept through which entrepreneurial activities are linked to sustainable development objectives. The prominence of this cluster reflects the increasing recognition that entrepreneurship is no longer evaluated solely in terms of economic value creation but also by its contribution to environmental protection and long-term societal well-being.

The **second cluster** (red) focuses on *sustainability* and *innovation*, incorporating concepts such as environmental protection, environmental impact, and green product innovation. This cluster suggests that innovation has become the principal mechanism through which sustainability objectives are translated into business practices. Rather than treating sustainability as a regulatory obligation, contemporary research increasingly conceptualizes it as a strategic capability that enhances organizational competitiveness while generating environmental value.

The third cluster (blue) is organized around *green entrepreneurial orientation (GEO)*, *green innovation*, *green intellectual capital*, and *sustainable performance*. The emergence of this cluster demonstrates a significant shift in the literature from examining green entrepreneurship as an individual entrepreneurial phenomenon toward understanding it as a strategic organizational capability. This finding is consistent with the Resource-Based View (RBV), which argues that valuable organizational resources and capabilities constitute the foundation of sustainable competitive advantage. Within this perspective, GEO represents a strategic orientation that enables firms to develop innovation capabilities and achieve superior sustainability performance.

The fourth cluster (yellow) comprises *green economy*, *environmental economics*, and *entrepreneur*. This cluster positions green entrepreneurship within a broader macroeconomic and policy context, emphasizing its contribution to economic transformation toward low-carbon and environmentally sustainable development. The presence of this cluster demonstrates that the literature has expanded beyond firm-level analyses to include policy, institutional, and economic perspectives.

Overall, the keyword network illustrates the intellectual evolution of the field. Earlier studies primarily focused on environmental entrepreneurship and sustainable development, whereas more recent research increasingly emphasizes organizational capabilities, strategic orientation, innovation, and sustainability performance. This evolution indicates that green entrepreneurship has matured into a multidisciplinary

research domain integrating entrepreneurship, strategic management, innovation, environmental science, and sustainability studies.

The occurrence frequency and Total Link Strength (TLS) reported in Table 1 further confirm the centrality of green entrepreneurship, green entrepreneurial orientation, and sustainability within the research network. The relatively high TLS values indicate that these concepts serve as the principal intellectual hubs connecting multiple research themes, thereby demonstrating their strategic importance in shaping future research directions.

Table 1. Most Relevant Keywords By Occurrence And Total Link Strength

Keyword	Occurrences	Total link strength
green entrepreneurship	34	46
sustainability	17	43
green entrepreneurial orientation	29	40
entrepreneur	11	37
green economy	7	29
sustainable development	12	29
green innovation	9	28
innovation	7	27
environmental economics	6	21
sustainable performance	8	14
sustainable entrepreneurship	5	6



Figure 7. Country co-authorship network

Figure 7 illustrates the international collaboration network among countries. Unlike publication productivity, which measures research output, the co-authorship network reflects the intensity of scientific collaboration among researchers from different countries.

The network is relatively sparse and fragmented, suggesting that international collaboration in green entrepreneurship research is still developing. Malaysia occupies a central bridging position by connecting several otherwise weakly connected research clusters, thereby facilitating knowledge exchange across different regions. Such a bridging role highlights Malaysia's strategic importance in fostering international collaboration within this research domain.

China and the United Kingdom remain among the leading contributors in terms of publication productivity and collaboration. Their strong positions reflect well-established research infrastructures and sustained investments in sustainability-related research. Other countries, including Italy, Saudi Arabia, Pakistan, Jordan, and Oman, also participate actively in international collaborations, although the intensity of their connections varies.

Indonesia represents an interesting case within the international collaboration network. Although the country demonstrates a growing contribution to the literature on green entrepreneurship and sustainability, its Total Link Strength (TLS) is only 1, substantially lower than China (16), Malaysia (13), Pakistan (12), Saudi Arabia (10), and Italy (7). This relatively low TLS indicates that Indonesian publications are still predominantly produced through domestic collaborations, with limited participation in international research networks. Strengthening cross-country collaboration would therefore enhance research visibility, facilitate knowledge exchange, improve citation impact, and contribute to the development of more globally applicable theoretical perspectives on green entrepreneurship and sustainability.

From a theoretical perspective, the fragmented collaboration network suggests that knowledge production in green entrepreneurship is still geographically dispersed. Greater international collaboration would enable comparative studies across institutional contexts, thereby enriching the theoretical understanding of how environmental regulation, entrepreneurial ecosystems, and national sustainability policies influence green entrepreneurial behaviour. Such collaborative research would also strengthen the generalizability of existing theoretical frameworks, including the Resource-Based View, Dynamic Capability Theory, and Institutional Theory, across different economic and cultural settings.

Overall, the science mapping analysis demonstrates that research on green entrepreneurship and sustainability has reached considerable conceptual maturity, as reflected by well-developed thematic clusters. Nevertheless, the international collaboration network remains relatively fragmented, highlighting substantial opportunities for stronger cross-country research partnerships and broader theoretical integration in future studies.

Note on Country Productivity and Co-authorship Analysis. It should be noted that the document counts reported in Figure 5 and Table 2 are not directly comparable because they are derived from two different bibliometric analyses. Figure 5 presents publication productivity based on Scopus Analytics, which reports the total number of publications attributed to each country. In contrast, Table 2 summarizes the country co-authorship network generated using VOSviewer after applying predefined inclusion thresholds for network visualization. Consequently, the number of documents associated with individual countries may differ between the two analyses. These differences reflect the distinct analytical purposes of publication productivity analysis and co-authorship network analysis rather than inconsistencies in the dataset.

Table 2. Country Co-Authorship Metrics: Documents, Citations, And Total Link Strength

Country	Documents	Citations	Total link strength
China	12	588	16
Malaysia	10	212	13
Pakistan	6	152	12
Saudi Arabia	8	144	10
Italy	5	227	7
Jordan	4	323	5
Oman	4	323	5
United Kingdom	8	251	5
Indonesia	7	22	1

Thematic Synthesis (RQ3)

The third research question explores how the literature conceptualizes the relationship between green entrepreneurship and sustainability. Through qualitative thematic coding of the 62 selected articles, three dominant themes emerged: (1) Green Entrepreneurial Orientation as a Strategic Driver, (2) Green Innovation as a Mediating Mechanism, and (3) Contextual Factors as Boundary Conditions. Together, these themes provide a comprehensive conceptual framework explaining how organizations achieve sustainability outcomes through green entrepreneurship.

4.3.1 Green Entrepreneurial Orientation as a Strategic Driver

The first and most dominant theme identifies **Green Entrepreneurial Orientation (GEO)** as the primary strategic capability enabling firms to pursue sustainability objectives while maintaining competitive advantage. Across the reviewed studies, GEO is consistently associated with proactive environmental strategies, opportunity recognition, risk-taking, innovativeness, and the integration of environmental considerations into entrepreneurial decision-making.

Rather than viewing environmental responsibility as a regulatory obligation, firms with a strong green entrepreneurial orientation perceive sustainability as a strategic opportunity for innovation and long-term value creation. Consequently, GEO enhances firms' ability to develop environmentally friendly products, improve resource efficiency, respond to changing stakeholder expectations, and strengthen competitive positioning.

These findings strongly support the Entrepreneurial Orientation Theory, which argues that entrepreneurial behaviour is driven by innovativeness, proactiveness, and calculated risk-taking. The results further extend the Resource-Based View (RBV) by demonstrating that Green Entrepreneurial Orientation represents an intangible organizational capability that is valuable, rare, difficult to imitate, and capable of generating sustainable competitive advantage. Consequently, GEO should be viewed not merely as an environmental commitment but as a strategic organizational resource that underpins sustainable business performance.

This finding aligns closely with Dynamic Capability Theory, which emphasizes an organization's ability to sense opportunities, seize emerging market demands, and continuously reconfigure internal resources in response to environmental change. Green innovation therefore represents the dynamic capability that enables organizations to convert strategic orientation into sustainable competitive advantage.

The increasing prominence of green innovation within recent publications also reflects a broader transformation in sustainability research. Earlier studies primarily emphasized environmental compliance, whereas contemporary research increasingly views innovation as the central mechanism through which firms simultaneously achieve economic competitiveness and environmental sustainability.

4.3.2 Green Innovation as a Mediating Mechanism

The second dominant theme positions **green innovation** as the principal mechanism through which Green Entrepreneurial Orientation translates into sustainability performance. The reviewed literature consistently indicates that organizations with stronger entrepreneurial orientation are more likely to develop green products, cleaner production processes, environmentally responsible business models, and eco-efficient operational practices.

Importantly, most empirical studies suggest that the relationship between entrepreneurial orientation and sustainability outcomes is indirect rather than direct. Instead, green innovation functions as a mediating capability that transforms entrepreneurial intentions into measurable environmental, social, and economic performance.

This finding aligns closely with **Dynamic Capability Theory**, which emphasizes an organization's ability to sense opportunities, seize emerging market demands, and continuously reconfigure internal resources in response to environmental change. Green innovation therefore represents the dynamic capability that enables organizations to convert strategic orientation into sustainable competitive advantage.

The increasing prominence of green innovation within recent publications also reflects a broader transformation in sustainability research. Earlier studies primarily emphasized environmental compliance, whereas contemporary research increasingly views innovation as the central mechanism

through which firms simultaneously achieve economic competitiveness and environmental sustainability.

4.3.3 Contextual Factors as Boundary Conditions

The third theme highlights the importance of contextual factors in shaping the effectiveness of green entrepreneurship. The reviewed studies consistently demonstrate that the relationship between Green Entrepreneurial Orientation, green innovation, and sustainability performance is influenced by external institutional conditions, including government regulations, environmental policies, financial support, market readiness, stakeholder pressure, and national innovation ecosystems.

Organizations operating within supportive institutional environments are generally more capable of implementing green innovations successfully, whereas firms facing regulatory uncertainty or limited institutional support encounter greater barriers to sustainable entrepreneurial activities.

These findings correspond closely with Institutional Theory, which argues that organizational behaviour is shaped by regulatory, normative, and cognitive institutional pressures. Government incentives, environmental regulations, sustainability standards, and societal expectations collectively encourage firms to adopt environmentally responsible entrepreneurial practices. Consequently, the success of green entrepreneurship depends not only on internal organizational capabilities but also on the quality of the surrounding institutional environment.

The reviewed studies further indicate that contextual factors are particularly important in emerging economies, where institutional arrangements, public policy, and market development significantly influence firms' capacity to implement green business strategies.

Integrated Conceptual Framework

The thematic synthesis suggests that the relationship between green entrepreneurship and sustainability can be understood as an integrated strategic process. Green Entrepreneurial Orientation serves as the initial strategic capability that motivates firms to pursue environmental opportunities. Green innovation subsequently acts as the mediating mechanism translating this orientation into tangible sustainability outcomes. Finally, institutional and contextual factors strengthen or weaken these relationships by influencing firms' ability to implement sustainable entrepreneurial strategies effectively. This integrated framework demonstrates that sustainability performance is not determined by a single organizational factor but rather emerges from the interaction between strategic orientation, innovation capability, and institutional support. The findings therefore provide a comprehensive explanation of how green entrepreneurship contributes to sustainable development while simultaneously advancing theoretical integration across entrepreneurship, strategic management, and sustainability research.

Theoretical and Practical Implications

The thematic synthesis contributes to theory by integrating four complementary perspectives: Entrepreneurial Orientation Theory, Resource-Based View, Dynamic Capability Theory, **and** Institutional Theory. Rather than treating these perspectives independently, the findings demonstrate that they collectively explain how organizations create sustainable competitive advantage through green entrepreneurship.

From a practical perspective, the findings suggest that policymakers should strengthen institutional support through environmental regulations, financial incentives, and innovation policies that encourage green entrepreneurial activities. Business managers should view Green Entrepreneurial Orientation as a long-term strategic capability and invest in continuous green innovation to improve environmental performance while maintaining competitiveness. Furthermore, universities and research institutions should foster interdisciplinary collaboration to accelerate knowledge development and facilitate the diffusion of sustainable entrepreneurial practices across industries and national contexts.

Conclusion

This study provides a comprehensive overview of the intellectual landscape of green entrepreneurship and sustainability by integrating bibliometric analysis with a systematic literature review. Through the analysis

of 62 Scopus-indexed articles, the study addressed three research questions concerning publication performance, science mapping, and thematic conceptualization. The bibliometric performance analysis revealed a substantial increase in research output over recent years, indicating that green entrepreneurship has evolved into a rapidly expanding multidisciplinary research field. Business, Management, and Accounting remains the dominant subject area, reflecting the strategic role of entrepreneurship in promoting sustainable business practices while simultaneously addressing environmental challenges. Science mapping further demonstrated that the intellectual structure of the field is organized around several interconnected themes, with Green Entrepreneurial Orientation, green innovation, and sustainability emerging as the most influential concepts. The country co-authorship analysis also showed that, although research has expanded across numerous countries, international collaboration remains relatively fragmented, suggesting considerable opportunities for strengthening global research partnerships.

The systematic literature review identified three dominant conceptualizations explaining the relationship between green entrepreneurship and sustainability. First, Green Entrepreneurial Orientation functions as a strategic organizational capability that enables firms to recognize and exploit environmentally sustainable business opportunities. Second, green innovation serves as the primary mediating mechanism through which entrepreneurial orientation is translated into environmental, social, and economic performance. Third, institutional and contextual factors including government policies, regulatory frameworks, stakeholder expectations, and innovation ecosystems act as important boundary conditions that influence the effectiveness of green entrepreneurial activities.

This study makes several important contributions. Theoretically, it integrates the Resource-Based View, Dynamic Capability Theory, Institutional Theory, and Entrepreneurial Orientation Theory into a unified conceptual framework for explaining how green entrepreneurship contributes to sustainability. By demonstrating the complementary roles of strategic orientation, innovation capability, and institutional support, the study advances a more comprehensive understanding of sustainable entrepreneurial behaviour. Methodologically, the study demonstrates the value of integrating bibliometric performance analysis, science mapping, and systematic literature review within a single analytical framework. This integrated approach enables researchers to combine quantitative mapping of the scientific landscape with qualitative thematic synthesis, thereby providing richer and more robust evidence than either method could generate independently.

Despite these contributions, several limitations should be acknowledged. First, the analysis was limited to publications indexed in the Scopus database, potentially excluding relevant studies indexed elsewhere. Second, the review included only open-access articles to ensure full-text availability for qualitative thematic analysis, which may have introduced selection bias by excluding subscription-based publications. Third, the dataset was restricted to the Business, Management, and Accounting subject area, and therefore may not fully capture contributions from related disciplines such as Environmental Science, Engineering, Economics, or Public Policy. These limitations should be considered when interpreting the findings.

Future research should expand the scope of bibliometric investigations by incorporating multiple databases, including Web of Science, Dimensions, and other reputable indexing services, while also considering both open-access and subscription-based publications. Comparative cross-country studies, longitudinal analyses of the evolution of green entrepreneurship, and interdisciplinary research integrating environmental science, technology, and public policy are particularly encouraged. Furthermore, emerging topics such as Artificial Intelligence, blockchain technology, digital transformation, circular economy, climate entrepreneurship, and sustainable finance offer promising directions for future investigation, provided that their relationship with green entrepreneurship and sustainability is examined through rigorous theoretical and empirical approaches. Overall, the findings demonstrate that green entrepreneurship has become an increasingly important strategic approach for achieving sustainable development. As environmental challenges continue to intensify worldwide, strengthening collaboration among researchers, policymakers, and business practitioners will be essential for advancing both theoretical knowledge and practical implementation of sustainable entrepreneurial practices.

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