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ADVANCING SUSTAINABILITY IN ORGANIC FOOD SMES THROUGH GREEN ENTREPRENEURSHIP – A BIBLIOMETRIC ANALYSIS OF THE PAST DECADE OF RESEARCH

A FENNTARTHATÓSÁG ELŐMOZDÍTÁSA A BIOÉLELMISZER-IPARI KIS- ÉS KÖZÉPVÁLLALKOZÁSOKBAN A ZÖLD VÁLLALKOZÁS RÉVÉN – AZ ELMÚLT ÉVTIZED KUTATÁSAINAK BIBLIOMETRIAI ELEMZÉSE

This bibliometric study analyses 157 publications (between 2015 and March 2025) mapping research at the intersection of green entrepreneurship, sustainability, and organic food SMEs. Citation network analysis identified six thematic clusters: sustainable business model innovation, financing mechanisms for green innovation, transformative entrepreneurship, circular economy strategies, institutional support systems, and hybrid business models in organic food. Performance analysis reveals that systematic reviews and conceptual frameworks predominate in high-impact research (GCS: 1.6-8.8). Temporal evolution shows a transition from broad sustainability frameworks pre-2020 to focused innovation strategies post-2020, driven by the European Green Deal and UN Sustainable Development Goals. Geographic concentration in Western Europe and Asia limits cross-contextual applicability. Critical gaps include longitudinal validation of sustainable business models, gender-inclusive entrepreneurship research, and digital transformation pathways in developing economies. This study advances bibliometric methods in entrepreneurship research while providing evidence-based priorities for scholars, policymakers, and practitioners in organic food sustainability.

Keywords: **green entrepreneurship, organic food SMEs, sustainable business models, circular economy, bibliometric analysis**

Ez a bibliometriai tanulmány 157 publikációt elemez (2015–2025 március között), feltérképezve a zöld vállalkozás, fenntarthatóság és organikus élelmiszer KKV-k metszéspontjában zajló kutatásokat. Az elemzés során citációs hálózatelemzéssel hat tematikus klasztert azonosítottak a szerzők: fenntartható üzletimodell-innováció, zöld innovációk finanszírozási mechanizmusai, transzformatív vállalkozás, körforgásos gazdasági stratégiák, intézményi támogatási rendszerek, valamint hibrid üzleti modellek az organikus szektorban. Emellett a teljesítményelemzési módszer kimutatta, hogy a szisztematikus áttekintések és a koncepcionális keretrendszerek dominálnak a nagy hatású kutatásokban (GCS: 1,6-8,8). Az időbeli változás elemzése a 2020 előtti széles fenntarthatósági keretrendszerektől a 2020 utáni célzott innovációs stratégiák felé mutat elmozdulást, amelyet az európai zöld megállapodás és az ENSZ fenntartható fejlődési céljai katalizáltak. A cikkek nyugat-európai és ázsiai koncentrációja korlátozza a kontextusok közötti átjárhatóságot. Kritikus hiányosságként a fenntartható üzleti modellek longitudinális validálása, a nemek közötti inkluzív vállalkozáskutatás a feltörekvő gazdaságok digitális transzformációja azonosíthatók. A tanulmány a bibliometriai módszertan fejlesztése mellett megalapozott fejlesztési irányokat mutat kutatóknak, döntéshozóknak és gyakorlati szakembereknek.

Kulcsszavak: **zöld vállalkozás, organikus élelmiszer KKV-k, fenntartható üzleti modellek, körforgásos gazdaság, bibliometriai elemzés**

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Green Entrepreneurship, particularly among Small- and Medium-Sized Enterprises (SMEs), has become an important driver of sustainability in environmentally conscious markets. By integrating ecological considerations into their core strategy, green entrepreneurs create innovative business models that aim to succeed in both economic and ecological terms (Schaltegger et al., 2016; Rodríguez-García et al., 2019; Rok & Kulik, 2021). The organic food industry serves as a unique example of green entrepreneurship. Here, the increasing consumer demand for sustainable products creates significant opportunities for small and medium-sized enterprises (SMEs) to innovate and expand. By incorporating eco-innovative methods into their business models, these businesses can improve their environmental performance and enhance their competitive advantages (Ersoy et al., 2022; Bossle et al., 2016). However, despite the growing number of studies on green entrepreneurship and sustainable practices, there remains a lack of systematization of research at the interface of green entrepreneurship, sustainability, and organic food SMEs.

While bibliometric studies have addressed associated areas including agriculture, food entrepreneurship broadly (Petrolo et al., 2022), sustainability strategies in agribusiness (Alvarez-Ochoa et al., 2024), and green marketing trends (Bhardwaj et al., 2023). To the best of our knowledge, no prior study has systematically mapped the intellectual structure of the research at the specific interface of green entrepreneurship, sustainability practices, and organic food SMEs. Given the sector's high-growth profile and its contribution to the Sustainable Development Goals (SDGs), this gap is especially relevant. Furthermore, the lack of citation-based synthesis also limits researchers' understanding of how research topics develop over time, how they connect across different knowledge domains, and what new research frontiers emerge in this area.

To address this gap, this study aims to map and synthesize the scholarly literature on sustainable business model innovation, circular economy strategies, hybrid entrepreneurship, and alternative funding models in the context of organic food small and medium-sized enterprises (SMEs) using bibliometric analysis. In doing so, the study aims to inform entrepreneurs, policymakers, and researchers about how this research stream has evolved and where it is heading. Specifically, this bibliometric study systematically evaluates the field's intellectual structure, thematic development, and research trends at the intersection of green entrepreneurship, sustainability, and organic food SMEs over the last decade (2015-2025). To achieve this, this study has four research objectives. First, identify and describe the leading publications, authors, and journals that have contributed to the understanding of green entrepreneurship in organic food SMEs through Global Citation Score (GCS) analysis and temporal publication trend analysis. Second, map the intellectual structure of research on green entrepreneurship in organic food SMEs by identifying thematic areas and their relationships with other areas of research using Citation Network Analysis (CAN) and keyword co-occurrence mapping to reveal the research knowledge base. Third, analyze the temporal development of thematic areas of research using Thematic Evolution Structure Analysis (TESA) and Thematic Mapping (TM) to determine how the research area is evolving and where it may develop in the future. Finally, synthesize the theoretical, practical, and policy implications of the bibliographic analysis findings to identify critical research gaps and provide action-oriented recommendations to help the application of sustainable entrepreneurship theory and practice in the organic food industry.

The following section outlines the literature review on green entrepreneurship, covering its definitions, frameworks, and historical development. It also examines sustainability practices and the circular economy from the perspective of SMEs, along with organic food as an underexplored nexus. Next, the materials and methods section describes the approaches for collecting and analyzing bibliometric data. Following this, the results section presents performance analysis, thematic clusters, keyword trends, and temporal patterns. The discussion then interprets the findings, focusing on theoretical, practical, and policy implications, along with future research directions and limitations. Finally, the conclusion summarizes thematic areas and provides recommendations for key stakeholders.

Literature Review

Green Entrepreneurship: Definitions, Frameworks, and Evolution

Green entrepreneurship has shifted from being a niche idea to a key concept in sustainability studies over the last twenty years. Initial definitional efforts identified ecopreneurs as individuals who create businesses primarily driven by environmental goals, seeing environmental issues as opportunities for business (Kirkwood & Walton, 2010). Gibbs (2006) described ecopreneurs as vital players in a sustainable economy, who incorporate environmental values into the core of their business operations rather than viewing sustainability merely as an aspect of corporate social responsibility. In addition, Santini (2017) combined various definitions, suggesting that ecopreneurship ranges from companies that produce eco-friendly products to those that fundamentally overhaul production systems for ecological restoration, while also recognizing ongoing conceptual confusion about the distinctions among green, ecological (eco-), and sustainable entrepreneurship.

Current theoretical models stress the interdependent dynamics between entrepreneurial actions and institutional contexts. Schaltegger et al. (2016) developed a foundational framework that portrays green entrepreneurs as agents of sustainability who navigate multi-stakeholder ecosystems through adaptable strategies. This framework was expanded through collaborative entrepreneurship models aligned with the UN Sustainable Development Goals (Schaltegger et al., 2018), thereby establishing normative policy foundations. Olteanu and Fichter (2022) translated these theoretical frameworks into practical applications by categorizing transformation-focused start-ups, highlighting the variety of sustainability approaches.

Additionally, recent focus on institutional support structures illustrates how university ecosystems and external entities influence the conversion of green entrepreneurial intentions into actionable behaviors (Alshebami, 2023; Yi, 2021), although the concentration of research in academic settings limits its applicability to larger entrepreneurial ecosystems. Nonetheless, despite theoretical advances, empirical gaps remain in understanding the long-term development paths of ventures, failure factors in sustainable startups, and contextual differences across institutional settings.

Sustainability Practices and Circular Economy in SME Contexts

Implementing sustainability in small and medium-sized enterprises (SMEs) presents unique challenges compared to larger companies, primarily due to limited resources, a lack of formal processes, and greater entrepreneurial flexibility. Research indicates strong positive correlations between green and sustainable business models and various developmental outcomes across economic, social, strategic, and environmental areas (Mondal et al., 2022). However, the implementation paths differ significantly by organizational size and sector. For example, Rodríguez-Espíndola et al. (2022) stated that circular economy principles have emerged as frameworks for enacting sustainability, focusing on closed-loop systems, efficient resource use, and the transformation of waste into valuable resources. Furthermore, Briguglio et al. (2021) highlighted important differences between companies that are inherently circular and those that are working to adopt circularity, noting that startups typically face fewer obstacles due to the lack of legacy systems but struggle with limited resources. Moreover, Rodríguez-Espíndola et al. (2022) found in their analysis of Mexican SMEs that the adoption of circular economy practices hinges on the simultaneous presence of economic feasibility, regulatory support, and cultural acceptance, while institutional quality influences the relationship between sustainability values and circular actions.

Moreover, studies on sustainable business model innovation indicate conflicts between profitability and sustainability. Provasnek et al. (2017) created structured frameworks that incorporate Triple Bottom Line metrics into corporate entrepreneurship, while Urbaniec et al. (2022) showed that bioeconomy strategies can promote sustainable entrepreneurship within resource-oriented sectors. Rok and Kulik (2021) further found that circular startups in developing economies grapple with the "sustainable startup paradox," in which they are expected to meet ambitious environmental targets despite the resource constraints common to early-stage businesses. However, alternative funding approaches, particularly equity crowdfunding, offer opportunities to broaden access to sustainability-focused entrepreneurship (Troise et al., 2021). Nevertheless, according to Testa et al. (2020), the success of these ventures relies heavily on clear communication with stakeholders and the framing of sustainability attributes. Key research gaps still exist, including the need for long-term evaluations of sustainability performance post-implementation, comparative studies across different institutional arrangements, and investigations into the power dynamics within circular supply chain governance that may affect the terms of SME participation.

Organic Food Entrepreneurship: An Underexplored Nexus

The organic food sector is an important yet often overlooked area for research in green entrepreneurship. Despite significant market growth in Western Europe and North America (Borsellino et al., 2020). Entrepreneurial dynamics in this field receive relatively little academic attention compared with those of other green industries. This research gap is particularly striking, considering that organic food small and medium-sized enterprises (SMEs) embody hybrid organizational models that strive for environmental sustainability, economic profitability, and the maintenance of a social mission, the core challenge of green entrepreneurship.

Research to date highlights specific sector characteristics that distinguish organic food entrepreneurship from broader green initiatives. Jolink and Niesten (2015) provided groundbreaking empirical insights into how organic food ecopreneurs convert environmental externalities into customer value propositions, while also managing tensions between their sustainability commitments and market competitiveness. Furthermore, Reynolds and Holt (2021) used life-story methodologies, revealing that founders' sensemaking and personal identity development processes significantly affect strategic choices in hybrid organic enterprises, indicating that adaptive self-awareness is a crucial entrepreneurial skill that goes beyond merely aligning organizational structures.

Nevertheless, significant obstacles persist. Dahiya et al. (2020) identified insufficient government support and limited stakeholder awareness as primary strategic challenges for female entrepreneurs in the organic food sector, particularly in emerging economies, alongside funding access and market development barriers. However, gender-related aspects remain unexamined, with research focusing on identifying barriers rather than on actionable pathways for inclusive entrepreneurship.

The intersection of green entrepreneurship, sustainability practices, and organic food SMEs remains unevenly integrated in the existing literature. First, thematic fragmentation hinders the understanding of sustainable business models, circular economic principles, and implementation challenges. Second, geographic concentration in Western Europe limits cross-regional applicability. Third, research predominantly examines successful cases, overlooking failure dynamics. Fourth, empirical validation linking alternative financing and sustainability performance is lacking. Finally, systematic bibliometric analyses remain limited.

Materials and Methods

This study uses bibliometrics to identify and describe how research on green entrepreneurship, sustainability,

and organic food SMEs has developed over time, as well as the main conceptual or theoretical themes in these areas. The use of bibliometrics enables the objective and consistent evaluation of large numbers of scholarly documents to identify the most significant studies, emerging lines of inquiry, and major paradigm shifts (Donthu et al., 2021; Zupic & Čater, 2015). Recent applications in related domains provide methodological precedents: Petrolo et al. (2022) using bibliometric analysis along with thematic synthesis, identified 6 clusters in Agri-Food Entrepreneurship research. In addition, Alvarez-Ochoa et al. (2024) conducted a bibliometric analysis using two databases (Scopus and Web of Science) to investigate the use of sustainability strategies in agribusiness. Moreover, Bhardwaj et al. (2023) used VOSviewer to map trends in Green Marketing. The preceding studies show that bibliometric approaches are effective for synthesizing complex, interdisciplinary research areas such as those described here.

Although the current study is based on a method of bibliometrics (citation analysis) rather than a method of systematic literature review (a method that uses inclusion/exclusion criteria), the methodology of collecting the data was based upon the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol to make the data collection as transparent, reproducible, and systematic as possible (Page et al., 2021). By combining citation network analysis, keyword co-occurrence mapping, and thematic evolution tracking, this study follows established bibliometric protocols (Donthu et al., 2021; Zupic & Čater, 2015). Using these three methods of analysis enables the identification of structural relationships between papers through citation analysis and thematic patterns through keyword analysis. These findings align with previous comprehensive reviews conducted by (Takalo et al., 2021) in the field of green innovation.

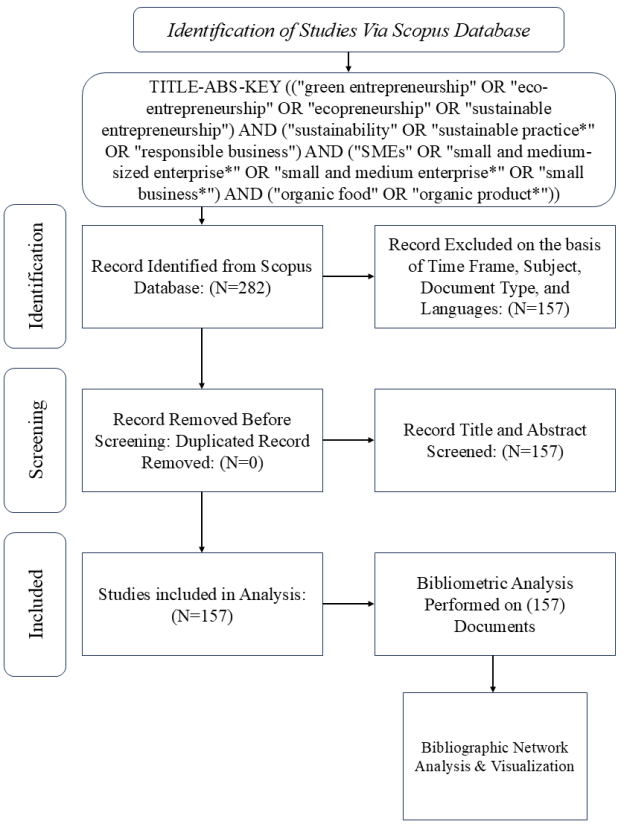
Data Collection and Selection

The search strategy employed a three-stage keyword identification procedure based on bibliometric methods in entrepreneurship and sustainability research (Alvarez-Ochoa et al., 2024; Petrolo et al., 2022). First, an exploratory review of seminal works on green entrepreneurship (Schaltegger et al., 2016), sustainable business models (Evans et al., 2017), and green innovation (Takalo et al., 2021) identified central conceptual terminology. Second, preliminary scoping searches tested the retrieval sensitivity and specificity of different keyword combinations. Third, the final Boolean search string combined validated terms with logical operators (AND/OR) to identify conceptual overlap among green entrepreneurship, sustainability practices, SME contexts, and organic food systems.

The Boolean query retrieved documents containing: ((“green entrepreneurship” OR “eco-entrepreneurship” OR “ecopreneurship” OR “sustainable entrepreneurship”) AND (“sustainability” OR “sustainable practice*” OR “responsible business”) AND (“SMEs” OR “small and medium-sized enterprise*” OR “small and medium enterprise*” OR “small business*”) AND (“organic food” OR “organic product*”)). Furthermore, query construction followed iterative bibliometric protocols (Alvarez-Ochoa et al., 2024), combining core concepts with terminological variants to maximize recall while maintaining precision, reflecting variability typical of entrepreneurship and sustainability literatures (Bhardwaj et al., 2023; Petrolo et al., 2022). Additionally, Takalo et al. (2021) stated that wildcard operators (i.e., “practice*”, “enterprise*”, “product*”) capture morphological variations while maintaining conceptual coherence. The temporal scope (2015–March 2025) captures contemporary research and development on green entrepreneurship following the adoption of the UN SDGs and the Paris Agreement (Schaltegger et al., 2018). This timeframe: (1) captures policy-driven acceleration in sustainability-oriented business research post-2015, (2) provides sufficient breadth (10 years) for thematic evolution analysis while excluding pre-paradigm literature, and (3) ensures contemporary relevance for practitioners and policymakers operating within current regulatory frameworks (Alvarez-Ochoa et al., 2024; Petrolo et al., 2022).

Figure 1

Paper Selection Procedure and Results



Source: adapted from Kumari and Jaiswal (2023)

From the initial search, 282 documents were retrieved. Following Kumari and Jaiswal (2023) selection framework and PRISMA guidelines (Page et al., 2021) (Figure 1), the use of systematic inclusion and exclusion criteria enhanced the dataset’s relevance and methodological robustness. First, subject-area filters (‘Business, Management and Accounting’ and ‘Social Sciences’) limited the scope to managerial and organizational perspectives, excluding

technical or engineering approaches, which are standard in entrepreneurship bibliometrics (Petrolo et al., 2022). Second, document type restrictions ('Article' and 'Review' only) excluded conference papers, book chapters, and editorials, prioritizing peer-reviewed scholarly contributions (Bhardwaj et al., 2023; Takalo et al., 2021). Finally, English-language restriction, while it may introduce geographic and linguistic bias, is a common practice in international bibliometric analyses (Bhardwaj et al., 2023; Petrolo et al., 2022) and facilitates consistent metadata extraction and keyword analysis. Following these criteria, no duplicates were identified among the 282 documents; 157 were selected for bibliometric analysis.

Analytical Techniques and Tools

To assess the research field's performance and conceptual framework, a comprehensive bibliometric approach was adopted, following the analytical framework proposed by (Máté et al., 2024) outlined in Figure 2. This approach utilized two primary analytical tools: VOSviewer version 1.6.20 (van Eck & Waltman, 2010) for citation network analysis and clustering, and the bibliometrix R package version 4.4.2 via the Biblioshiny interface (Aria & Cuccurullo, 2017) for thematic and performance analytics. Specifically, VOSviewer mapped intellectual relationships and cluster formation. At the same time, bibliometrix/Biblioshiny conducted keyword co-occurrence network analysis, keyword tree-map visualizations, thematic evolution tracking (time-sliced), trend topics analysis, and three-field plots (AU-DE-SO). Additionally, Scopus-derived performance metrics were used to calculate citation impact indicators (Global Citation Score – GCS) and for descriptive statistics.

Following the framework outlined in Figure 2, bibliometric analysis employed three complementary software platforms. First, Scopus provided citation impact indicators, including Global Citation Scores (GCS) normalized by publication year (Table 2), along with descriptive statistics of the dataset (Table 1). Second, VOSviewer generated citation network visualization, clustering 54 cited documents into six thematic areas based on conceptual similarities (Figure 4a). Third, bibliometrix/Biblioshiny user friendly interface conducted five thematic and performance analyses: keyword co-occurrence networks (Figure 7), keyword tree maps (Figure 6), thematic evolution tracking (Figure 8), trend topics analysis (Figure 9), and three-field plots linking authors, themes, and journals (Figure 11).

Results

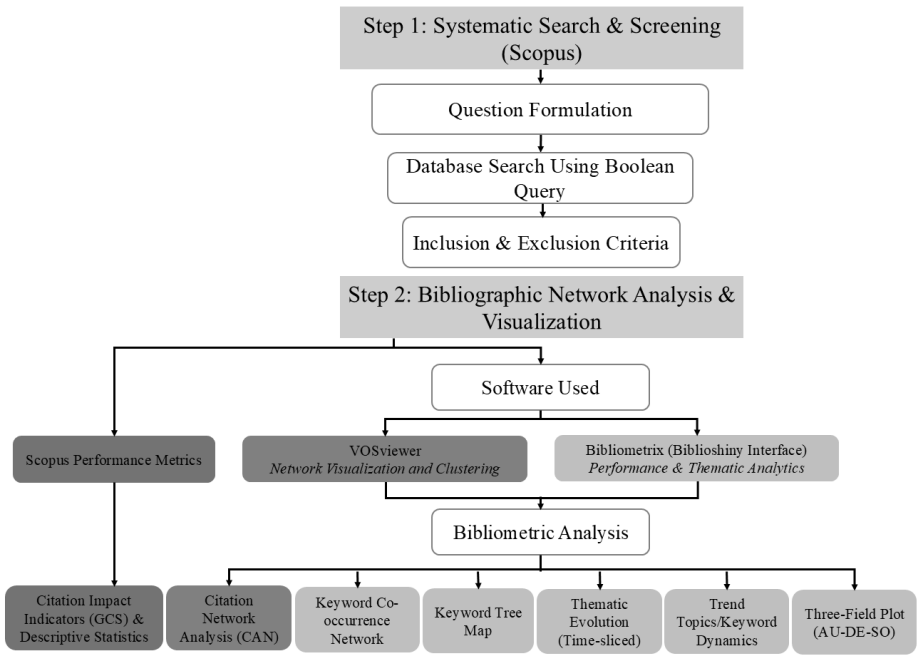
The bibliometric analysis reveals a rapidly evolving research domain characterized by theoretical consolidation, methodological diversification, and geographic concentration. Six thematic clusters emerge from citation network analysis, reflecting distinct but interconnected research streams. The following subsections present descriptive statistics, citation impact metrics, intellectual and conceptual structures, and temporal thematic evolution.

Descriptive Overview of the Dataset

The final dataset comprises 157 documents published between 2015 and March 2025, drawn from 86 scholarly sources (see Table 1). There are 523 authors represented in the corpus, and there is considerable evidence of co-authorship among them, with an average of 3.47 co-authors

Figure 2

Research Methodology of the Study



Source: adapted from Máté et al. (2024)

per document. In addition, there is substantial evidence of international collaboration (i.e., 36.31% international co-authorship), as indicated in Table 1.

Table 1

Main Bibliometric Information

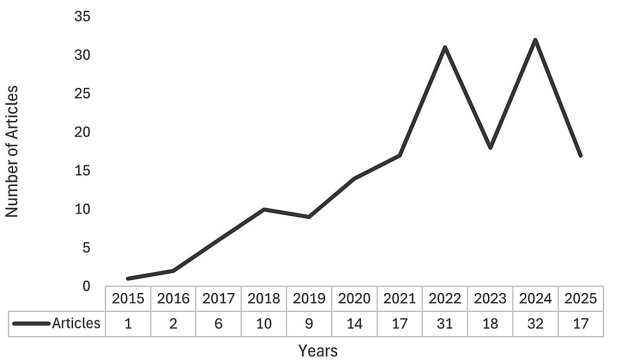
Indicator	Value
Timespan (data coverage)	2015–2025 (through March 2025)
Sources	86
Documents (final dataset)	157
Annual growth rate (%)	32.75
Authors	523
Single-authored documents (authors)	15
Co-authors per document	3.47
International co-authorship (%)	36.31
Author keywords (DE)	637
Keywords Plus (ID)	320
Average document age (years)	4.18
Average citations per document	34.75

Source: generated using Bibliometrix/Biblioshiny

Furthermore, annual scientific output shows a significant upward trend over the study period (2015-March 2025), increasing from minimal production in the early years (1-2 papers in 2015-2016) to consistent growth starting in 2017. The pace of publication picked up after 2020 (14 papers in 2020; 17 in 2021), reached a significant peak in 2022 (31), declined in 2023 (18), and surged again in 2024 (32) (see Figure 3). The 2025 (17) prediction should be viewed with caution due to the dataset's truncation (indexed up to March 2025). Annual scientific production data were exported from the bibliometrix/Biblioshiny user-friendly interface (Aria & Cuccurullo, 2017).

Figure 3

Annual Scientific Production



Source: data compiled by the authors

Performance Analysis (Global Citation Score – GCS)

Global Citation Score (GCS) analysis utilizing normalized Scopus citation counts evaluated publication impact. Table 2 presents the ten highest-cited documents as of March 2025. Takalo et al. (2021) systematic review achieved the highest GCS (8.8), synthesizing knowledge on green innovation and identifying future research directions. Rodríguez-Espíndola et al. (2022) attained a GCS of 8.25 through empirical examination of circular economy strategies in developing-region SMEs. In alternative financing, Troise et al. (2021) analyzed equity crowdfunding and open innovation in agri-food sustainability transitions, obtaining a GCS of 4.75, while Zameer and Yasmeen (2022) investigated consumer-driven sustainability, gaining a GCS of 3.75. Theoretically, Evans et al. (2017) established the foundations of sustainable business model innovation, receiving a GCS of 3.6, and Yi (2021) assessed entrepreneurial and institutional factors in the implementation of sustainability goals, acquiring a GCS of 3.0. Additional contributions came from Majeed et al. (2022), Borsellino et al. (2020), Schaltegger et al. (2016), and Testa et al. (2020), addressing marketing strategies, consumer behavior, and alternative finance mechanisms.

Top-cited publications predominantly employ systematic reviews (Evans et al., 2017; Takalo et al., 2021) and conceptual frameworks (Schaltegger et al., 2016), reflecting theoretical consolidation, while quantitative empirical studies (Rodríguez-Espíndola et al., 2022; Yi, 2021; Zameer & Yasmeen, 2022) constitute the secondary category. Notably, qualitative case studies remain underrepresented. Geographically, research focuses on Western Europe (Schaltegger et al., 2016; Testa et al., 2020) and Asia (Yi, 2021; Zameer & Yasmeen, 2022), with limited representation from Latin America, Africa, and Southeast Asia, which limits cross-contextual generalizability. Moreover, sample characteristics reveal a predominant focus on SMEs (Rodríguez-Espíndola et al., 2022; Troise et al., 2021), with insufficient attention to micro-enterprises and startups in the organic food sector.

Intellectual Structure: Citation Network Analysis

A Citation Network Analysis (CNA) was performed with VOSviewer to map the field's intellectual framework. Applying a minimal citation threshold of one per document, 54 documents were identified, connected by 90 citations. Initially categorized into 20 clusters, these were subsequently refined into six primary thematic areas based on citation relationships and conceptual similarities (see Table 3). Figure 4a (Overlay Visualization) illustrates the network, where node sizes represent citation impact and color shading indicates the year of publication. Notable contributions include those by Schaltegger et al. (2016), Evans et al. (2017), and (Jolink & Niesten, 2015). Figure 4b Citation Network Analysis (Density Visualization) highlights areas of intensive academic activity, with a particular focus on sustainable business models, green innovation, and transformative entrepreneurship. The following section delves deeper into the specifics of each cluster.

Table2

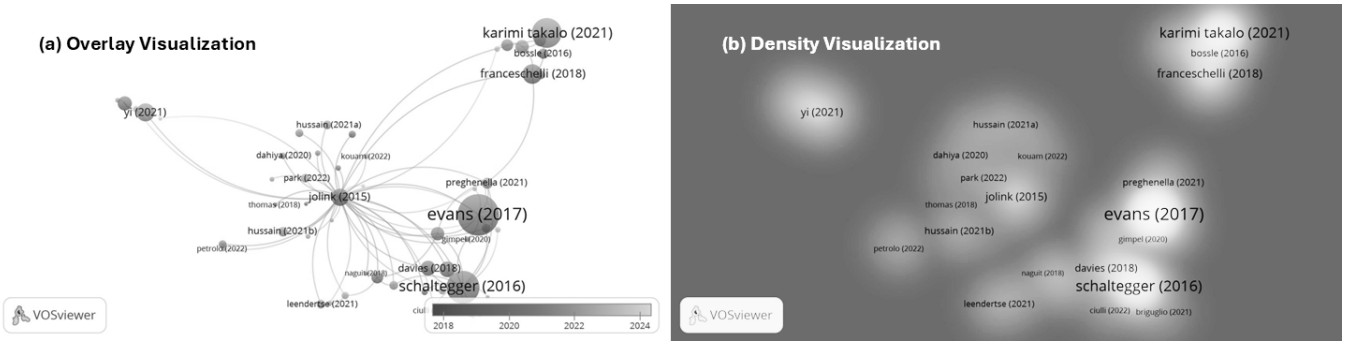
Top 10 Most Cited Articles Ranked by Normalized GCS

Rank	Title	Authors and Year of Publication	Journal	GSC	Normalized GSC	Research Approach	Country Context	Author Affiliation
1	Green innovation: A systematic literature review	Takalo & Tooranloo (2021)	Journal of Cleaner Production	44	8.8	SLR	International	Iran
2	The role of circular economy principles and sustainable-oriented innovation to enhance social, economic, and environmental performance: Evidence from Mexican SMEs	Rodríguez-Espíndola et al. (2022)	International Journal of Production Economics	33	8.25	Quantitative (SEM)	Mexico	UK, Mexico, France, Greece
3	Understanding the implications of equity crowdfunding on sustainability-oriented innovation and changes in agri-food systems: Insights into an open innovation approach	Troise et al. (2021)	Technological Forecasting and Social Change	19	4.75	Quantitative (SEM)	Italy	Italy, USA
4	Green innovation and environmental awareness drive green purchase intentions	Zameer & Yasmeen (2022)	Marketing Intelligence and Planning	15	3.75	Quantitative (SEM)	China	China
5	Business Model Innovation for Sustainability: Towards a Unified Perspective for Creation of Sustainable Business Models	Evans et al. (2017)	Business Strategy and the Environment	32	3.6	Conceptual	International	UK
6	From green entrepreneurial intentions to green entrepreneurial behaviors: the role of university entrepreneurial support and external institutional support	Yi (2021)	International Entrepreneurship and Management Journal	15	3	Quantitative (SEM)	China	China
7	Green Marketing Approaches and Their Impact on Green Purchase Intentions: Mediating Role of Green Brand Image and Consumer Beliefs towards the Environment	Majeed et al. (2022)	Sustainability (Switzerland)	14	2.8	Quantitative (SEM)	Pakistan	Pakistan, Hungary
8	Agri-food markets towards sustainable patterns.	Borsellino et al. (2020)	Sustainability (Switzerland)	12	2	Literature Review	International	Italy
9	Business Models for Sustainability: A Co-Evolutionary Analysis of Sustainable Entrepreneurship, Innovation, and Transformation	Schaltegger et al. (2016)	Organization and Environment	16	1.6	Conceptual	International	Germany, Austria
10	Crowdfunding as a tool to support sustainability-oriented initiatives: Preliminary insights into the role of product/service attributes	Testa et al. (2020)	Business Strategy and the Environment	11	1.6	Qualitative (Content Analysis)	Europe	Italy

Source: data compiled by the authors

Figure 4

Citation Network Analysis: (a) Overlay Visualization and (b) Density Visualization



Source: authors' compilation generated by VOSviewer.

The Citation Network Analysis (CNA) results reveal that scholarly work in this field primarily focuses on a few critical themes: sustainable business model innovation, green innovation in agri-food systems, circular entrepreneurship, and green entrepreneurial intentions. Table 3 outlines these significant thematic groups and their most impactful documents, serving as the basis for the thematic synthesis discussed in the next section.

The six clusters identified through citation network analysis (see Figure 5) represent distinct, yet interconnected research streams within green entrepreneurship, sustainability, and organic food SMEs. The following analysis examines each cluster's theoretical foundations, key empirical contributions, methodological approaches, and critical research gaps.

Table 3

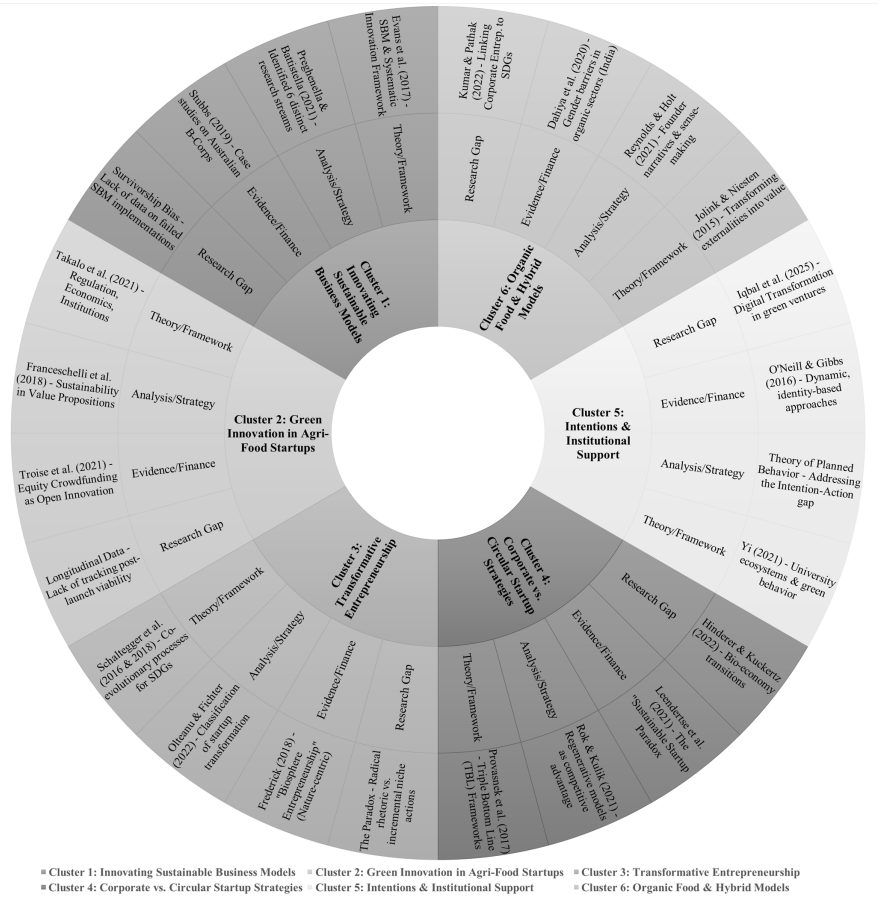
Summary of Main Research Clusters Identified Through Citation Network Analysis

Cluster	Nodes	Links	Topics	Top 3 cited papers	Period	Size %
1	8	39	Innovating Sustainable Business Models: Strategic Approaches and Future Directions	Evans et al. (2017); Stubbs (2019); Preghenella & Battistella (2021)	2017-2024	20.5%
2	8	20	Green Innovation in Agri-Food Startups and the Role of Open and Crowdfunded Models	Takalo et al. (2021); Franceschelli et al. (2018); Troise et al. (2021)	2016-2023	40%
3	7	24	Transformative Entrepreneurship for Sustainability: Co-evolution and Taxonomies	Schaltegger et al. (2016); Schaltegger et al. (2018); Olteanu & Fichter (2022)	2016-2022	29%
4	6	18	Corporate Entrepreneurship and Circular Start-up Strategies for Sustainable Impact	Provasnek et al. (2017); Rok & Kulik (2021); Leendertse et al. (2021)	2017-2022	33%
5	5	13	Green Entrepreneurial Intentions and Institutional Support Systems	Yi (2021); O'Neill & Gibbs (2016); Alshebami (2023)	2016-2025	38%
6	5	47	Organic Food Entrepreneurship and the Dynamics of Hybrid Business Models	Jolink & Niesten (2015); Reynolds & Holt (2021); Dahiya et al. (2020)	2015-2022	10%

Source: data compiled by the authors

Figure 5

Intellectual Structure of Green Entrepreneurship in Organic Food SMEs



Source: developed by the authors

Cluster 1: Innovating Sustainable Business Models: Strategic Approaches and Future Directions (Network: 8 nodes, 39 links, 20.5% representation, Period: 2017-2024)

Cluster 1 places sustainable business model (SBM) innovation at the forefront of theoretical discussions in the field (see Figure 5). Evans et al. (2017) introduced a foundational conceptual framework linking SBM to systematic innovation, while Preghenella and Battistella (2021) conducted a bibliographic meta-analysis that identified six distinct research streams and highlighted disciplinary fragmentation. Stubbs (2019) provided the sole empirical validation through case studies of Australian B-Corps, although this was confined to organizations structured as hybrids by law. However, three major limitations hinder practical relevance for organic food SMEs: (1) survivorship bias due to the focus on only successful cases, (2) temporal limitations stemming from cross-sectional approaches that fail to capture the evolution of SBM over time, and (3) scale ambiguity concerning the applicability to SMEs compared to large corporations. The cluster's mainly normative focus risks producing idealized models that are disconnected from the realities of resource-constrained hybrid value creation.

Cluster 2: Green Innovation in Agri-Food Startups and the Role of Open and Crowdfunded Models (Network: 8 nodes, 20 links, 40% representation, Period: 2016-2023)

Cluster 2 investigates the integration of sustainable development into agri-food innovation processes, highlighting a divergence between technology and finance streams. Takalo et al. (2021) identified three key factors of green innovation: regulation, economics, and institutions, though they did not provide an agriculture-specific context. Moreover, Franceschelli et al. (2018) illustrated the integration of sustainability into value propositions through a case study of an Italian pizzeria, while Troise et al. (2021) positioned equity crowdfunding as a method for open innovation aimed at stakeholder engagement, yet they overlooked the campaign failure rates exceeding 60% and the associated regulatory complexities. A temporal analysis shows a shift in focus, earlier studies (Bossle et al., 2016; Franceschelli et al., 2018) emphasized operational efficiency, while more recent research (Testa et al., 2020; Troise et al., 2021) stresses transparency and communication with stakeholders. Dangelico et al. (2019) introduced variations among organizations by comparing family-owned and non-family-owned firms. The remaining gap is the longitudinal assessment of sustainability and financial viability after the launch of crowdfunded projects.

Cluster 3: Transformative Entrepreneurship for Sustainability: Co-evolution and Taxonomies (Network: 7 nodes, 24 links, 29% representation, Period: 2016-2022)

Cluster 3 views transformative entrepreneurship as a change at the systems level through the lens of evolutionary economics. Schaltegger et al. (2016 & 2018) developed co-evolutionary frameworks that highlight the importance of adaptive collaboration among multiple stakeholders in line with the UN Sustainable Development Goals. Olteanu and Fichter (2022) further put this into practice by developing an empirical taxonomy of transformation orientations among German startups. Additional contextual studies include Viciunaite (2022), which focuses on consumer engagement; Stöhr and Herzig (2022), which examine pioneers in Germany's organic sector; and Briguglio et al. (2021), which study enablers of circular business, although there is limited integration across levels. Additionally, Frederick (2018) concept of "Biosphere Entrepreneurship" broadens the transformative scope beyond social and commercial entrepreneurship but remains largely theoretical. However, a contradiction arises: while the rhetoric promotes substantial systemic change, empirical findings indicate a tendency toward gradual niche development. Notable deficiencies include the absence of longitudinal studies tracking the progression from niche innovation to regime-level change, and a theoretical framework that addresses the resource limitations faced by SMEs that hinder their transformative potential.

Cluster 4: Corporate Entrepreneurship and Circular Start-up Strategies for Sustainable Impact (Network: 6 nodes, 18 links, 33% representation, Period: 2017-2022)

Cluster 4 emphasizes the differences in organizational strategies for adopting a circular economy. Provasnek et al. (2017) created frameworks for sustainable corporate entrepreneurship that incorporate Triple Bottom Line metrics, aligning with the work of Urbaniec et al. (2022) and Naguit (2018). On the other hand, Rok and Kulik (2021) observed how startups demonstrate agility by turning environmental challenges into competitive advantages through regenerative models that are not limited by legacy systems. Nonetheless, a key tension emerges: corporations have the resources for implementation but struggle with organizational inertia, while startups provide innovative agility but lack the scale of resources. This is referred to as the "sustainable startup paradox" (Leendertse et al., 2021). Hinderer and Kuckertz (2022) describe transitions to a bio-economy as enablers of the circular economy, although analyses by sector show disparities in access to opportunities and asymmetries in value capture. The geographic focus on European countries (e.g., Germany, Austria, Poland) restricts the generalizability of the regulatory environment. Additionally, notable gaps include analyses of comparative institutional configurations and the dynamics of governance power within circular supply chains.

Cluster 5: Green Entrepreneurial Intentions and Institutional Support Systems (Network: 5 nodes, 13 links, 38% representation, Period: 2016-2025)

Cluster 5 shows the highest network density at 38%, indicating a strong conceptual alignment with Theory of Planned Behavior frameworks (see Figure 5). Yi (2021) illustrated how support from universities and external

institutions facilitates the translation of intention into action, although the focus on the university context restricts the generalizability across broader ecosystems. O'Neill and Gibbs (2016) promote a dynamic, process-oriented approach in which entrepreneurial identities evolve alongside environmental conditions, necessitating empirical evidence. Moreover, Alshebami et al. (2023) explored the mechanisms of knowledge sharing that expedite transitions, while Lopez et al. (2021) presented ecocentric management, highlighting practices centered on the environment. Meanwhile, Iqbal et al. (2025) signify new frontiers that merge with digital transformation. Theoretical closure centered on TPB might overlook other explanatory perspectives, such as effectuation logic, identity-based entrepreneurship, and institutional entrepreneurship theories, that could better characterize the creation of organic food ventures. Notable gaps in cluster 5 include research into longitudinal intention trajectories and the development of a comprehensive theory on institutional support adaptation specifically for hybrid organic food business models.

Cluster 6: Organic Food Entrepreneurship and the Dynamics of Hybrid Business Models (Network: 5 nodes, 47 links, 10% representation, Period: 2015-2022)

Cluster 6 specifically examines organic food entrepreneurship, yet despite its importance in the sector, it remains relatively small, highlighting considerable research gaps. Jolink and Niesten (2015) delivered groundbreaking empirical insights into ecopreneurs who convert

Figure 6

Keywords Tree Map

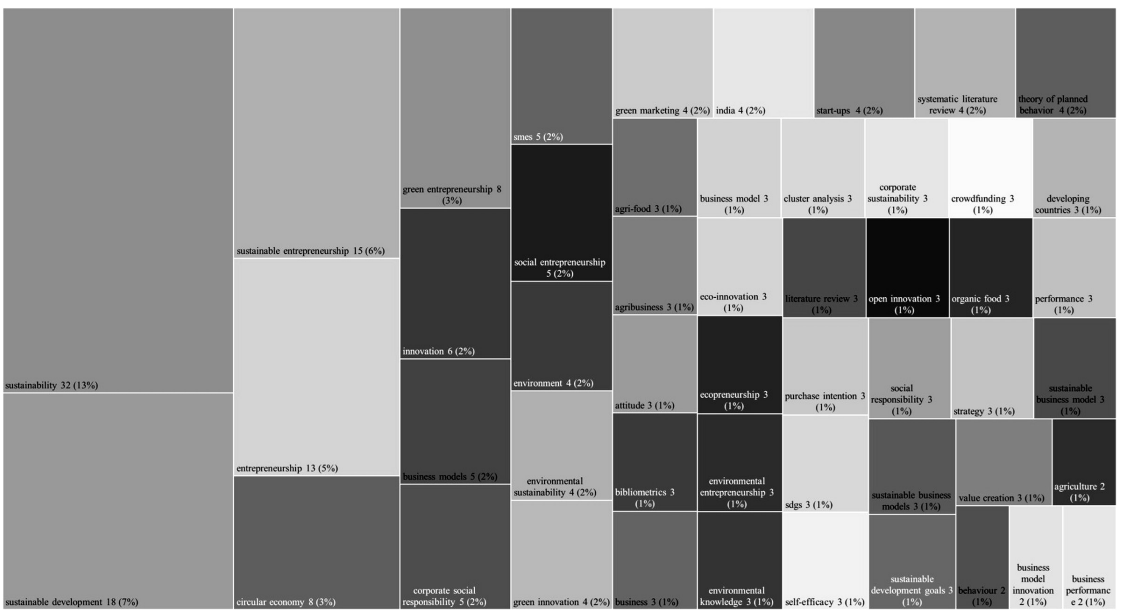


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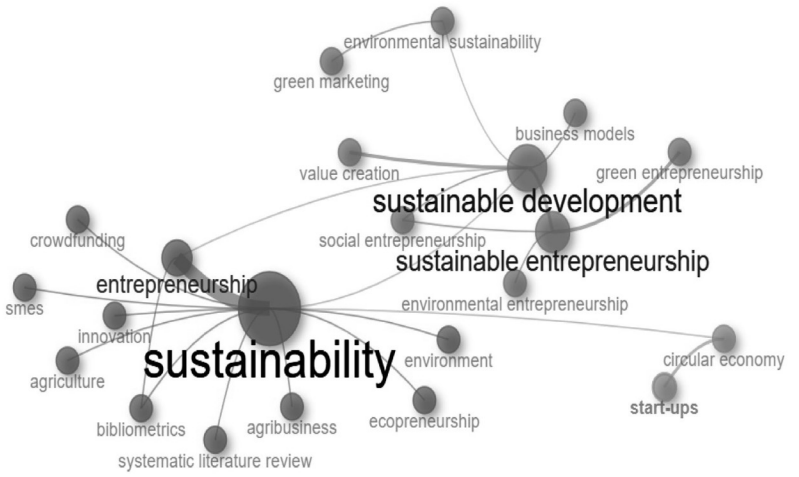
Figure 7

Keyword Co-occurrence Network



Source: generated using Bibliometrix/Biblioshiny

environmental externalities into customer value propositions while addressing tensions between sustainability and competitiveness. In addition, Reynolds and Holt (2021) used life-story narratives to examine how founders in hybrid ventures make sense of their experiences, indicating that personal identity development and reflexive processes shape strategic choices, although they did not identify cross-case patterns. Dahiya et al. (2020) further analyzed gender obstacles in Indian organic food entrepreneurship using total interpretive structural modeling, revealing socio-cultural limitations and suggesting inclusive frameworks. Whereas Kumar and Pathak (2022) linked sustainable corporate entrepreneurship to the UN SDGs and Kouam and Asongu (2022) examined the effects of tax policy on social innovation, neither study thoroughly addressed the specific characteristics of the organic food sector. Nevertheless, notable critical deficiencies include the need for integrative frameworks that link environmental, economic, and social imperatives and address resource orchestration challenges unique to organic food SMEs.

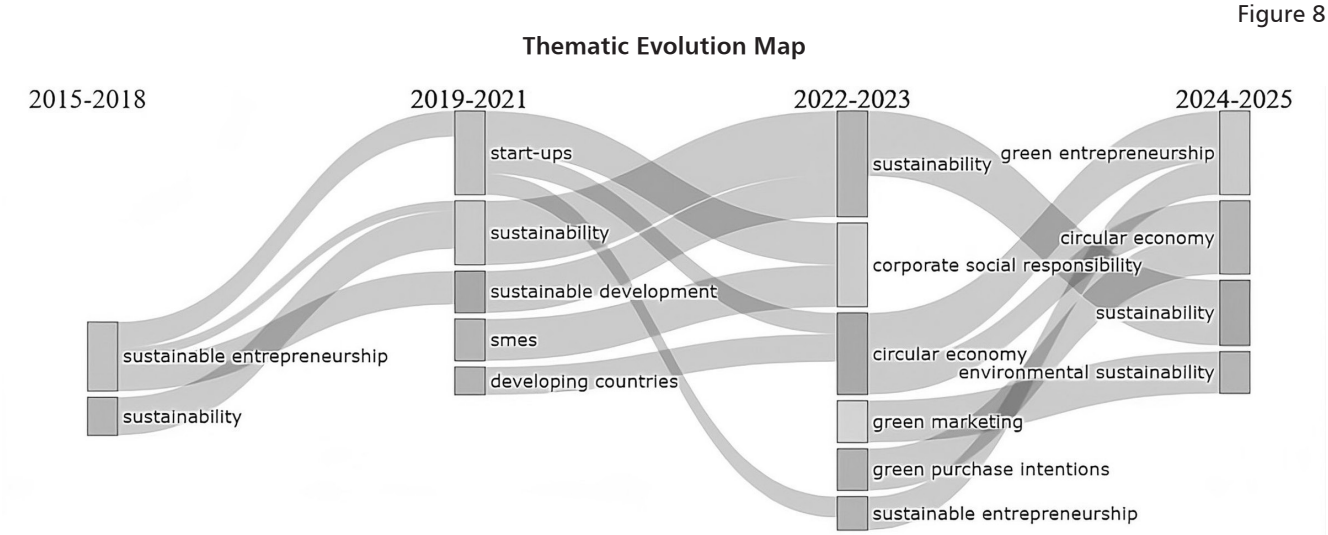
Keyword Analysis

Keyword tree map analysis (Figure 6) indicates that the most prominent keywords are sustainability (13%), sustainable development (7%), and sustainable entrepreneurship (6%). However, the keyword co-occurrence network (Figure 7) shows four thematic clusters. The red cluster comprises core sustainability and entrepreneurship concepts, combined with sectoral frameworks (agriculture, SMEs, agribusiness) and methodological terms, for example, systematic literature reviews. The blue cluster contains sustainable development, sustainable entrepreneurship, and business model concepts. Moreover, the green cluster links circular-economy concepts to startup ventures, and the purple cluster links environmental sustainability concepts to green marketing.

Thematic Evolution

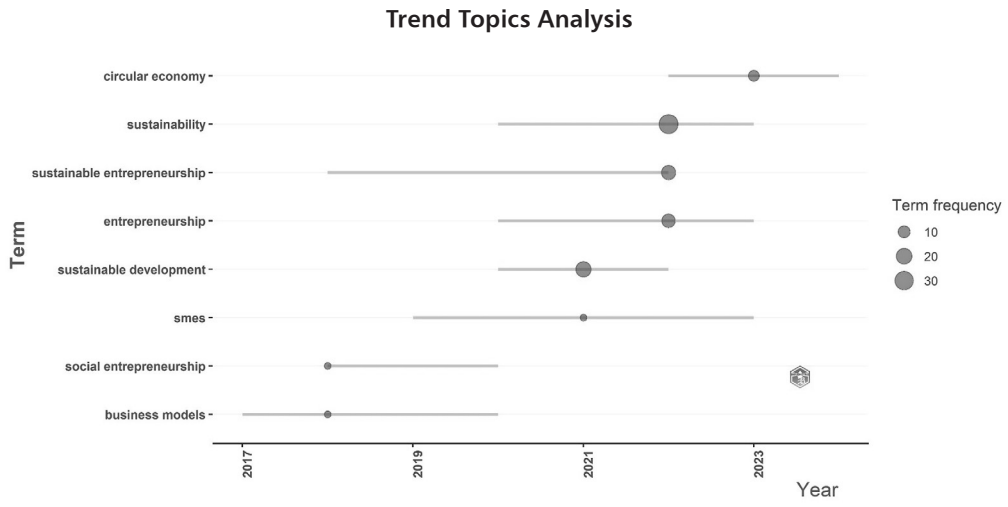
Thematic Evolution (Figure 8) indicates a progression in the maturity of thought on intellectual development, from a general discussion of sustainability to a greater focus on specific innovation strategies by 2024-2025.

Figure 8



Source: generated using Bibliometrix/Biblioshiny

Figure 9



Source: generated using Bibliometrix/Biblioshiny

Expansion into socio-economic levels (SMEs, developing countries) occurred in 2019-2021; 2022-2023 was the year of tactical diversification (Circular Economy, CSR, Green Marketing); and the present day focuses on Green Entrepreneurship and Circular Economy Integration, indicating a policy-driven, accelerated process.

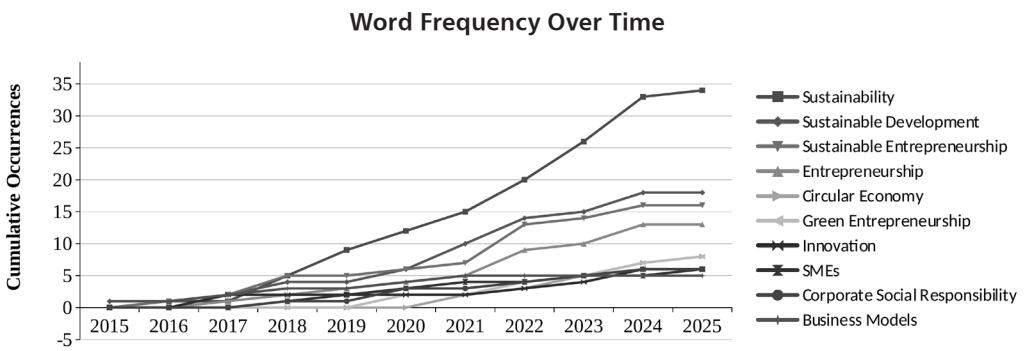
Temporal Trend Analysis

Temporal visualizations show how thematic priorities evolve over time. Trends Topics Analysis (Figure 9) shows that "sustainability," "sustainable entrepreneurship," "entrepreneurship," "sustainable development" and "circular economy" have consistently been discussed since 2021. Similarly, the data from Word Frequency Over Time (Figure 10) supports this conclusion by showing a continuous increase in frequency of words such as "sustainability," "sustainable entrepreneurship," "circular economy," "green entrepreneurship," "corporate social responsibility," and "business model innovation" for all years from 2015-2025. Therefore, there is clear evidence of an increasing focus on sustainable business practices.

Three-Field Plot

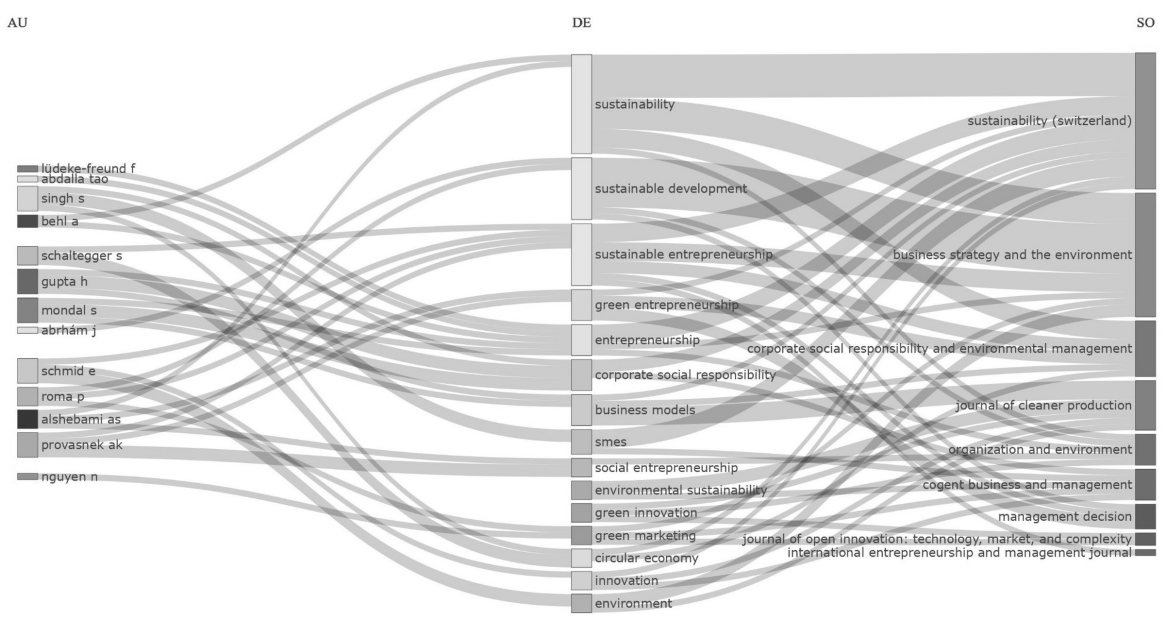
The Three-Field Plot (Figure 11) shows how researchers use their relationships with each other, research topics, and research venues to identify relationships among prolific authors, research themes, and publication venues. The key contributors to the field (Alshebami et al., 2023; Lüdeke-Freund et al., 2024; Schaltegger et al., 2016, 2018) have concentrated upon sustainability-related entrepreneurship research. The thematic landscape is organized hierarchically, with major themes (sustainability, sustainable entrepreneurship, sustainable development) connected to sub-themes (green entrepreneurship, corporate social responsibility, business model innovation, social entrepreneurship). Research output is concentrated in three journals (Sustainability, Business Strategy and the Environment, and Journal of Cleaner Production), but also appears in a large number of additional journals (Corporate Social Responsibility and Environmental Management; Journal of Open Innovation; International Entrepreneurship and Management Journal).

Figure 10



Source: generated using Bibliometrix/Biblioshiny

Figure 11



Source: generated using Bibliometrix/Biblioshiny

Discussion and implications

This study addressed the four stated research objectives through bibliometric analysis of 157 publications. First, the performance analysis *(RO1)* identified leading publications, including Takalo et al. (2021) and Evans et al. (2017), as well as key journals such as Sustainability and Business Strategy & Environment. Second, the citation network analysis *(RO2)* identified six thematic clusters representing the field's intellectual structure. Third, tracking the temporal evolution *(RO3)* showed a shift from broad sustainability frameworks before 2020 to more focused innovation strategies by 2024-2025. Building on these empirical findings, the fourth objective *(RO4)* addresses critical research gaps related to longitudinal validation, geographic representation, and gender-inclusive research. This section provides theoretical, practical, and policy recommendations while also acknowledging the limitations of the methodologies used.

Thematic Synthesis and Cross-Cluster Insights

The results underscore a diverse yet disjointed research arena (see Figures 7, 8, and 11). Business model innovation aimed at sustainability has emerged as a key focus, with studies such as Evans et al. (2017) and Stubbs (2019) highlighting the strategic reshaping of value-creation, delivery, and capture mechanisms. Recent meta-analytical evidence confirms the positive link between green and sustainable business models and sustainability outcomes across economic, social, strategic, and environmental dimensions (Mondal et al., 2022). Furthermore, the fusion of open innovation with alternative financing options, such as equity crowdfunding, offers a hopeful but less explored path. Additionally, Troise et al. (2021) and Franceschelli et al. (2018) demonstrate how novel funding frameworks can democratize access to sustainable entrepreneurship, with empirical evidence indicating that sustainability-oriented attributes in crowdfunding campaigns significantly impact funding success (Testa et al., 2020). However, empirical assessment across various contexts remains limited. This highlights a larger issue: although theoretical advancements outpace practical applications, challenges such as regulatory hurdles and consumer doubt hinder real-world implementation.

In addition, an interesting realization is the emergence of hybrid and transformative entrepreneurship models that aim to balance profitability, social impact, and environmental responsibility (Olteanu & Fichter, 2022; Schaltegger et al., 2016). Similarly, Reynolds and Holt (2021) provide evidence on how founders of hybrid organizations manage tensions between competing institutional logics, illustrating that sensemaking processes are essential for sustaining dual value propositions. However, the journey to achieving this equilibrium relies heavily on context and is often riddled with trade-offs, especially for SMEs with limited resources. These tensions highlight the importance of moving beyond idealized narratives toward sophisticated, multi-level evaluations that consider institutional, cultural, and market dynamics. Moreover, examining organic food SMEs has highlighted the key role of niche markets in promoting sustainability shifts. These organic food businesses exhibit mixed objectives but face obstacles such as gender barriers (Dahiya et al., 2020) and the challenge of cultivating consumer trust (Reynolds & Holt, 2021). Furthermore, effectively communicating sustainable business models to consumers remains a significant challenge, with translation theory indicating that companies should present sustainability initiatives as relevant product features and impacts rather than using vague business model language (Viciunaite, 2022). This implies that entrepreneurship focused on sustainability needs to be considered within broader socio-cultural frameworks and linked to evolving consumer expectations identified in the temporal trend analysis.

Theoretical Implications

This science mapping enhances the theoretical domain in multiple respects. Firstly, it advocates transitioning from static to dynamic, co-evolutionary models of green entrepreneurship (Schaltegger et al., 2016). Besides, recent advances in the theoretical understanding of sustainable business models underscore the importance of incorporating the principles of doughnut economics, which harmonize environmental limits with social essentials (Lüdeke-Freund et al., 2024; Preghenella & Battistella, 2021). Secondly, it highlights the crucial role of incorporating finance, governance, and entrepreneurial identity into models of sustainable business change. The notion of "biosphere entrepreneurship" (Frederick, 2018) further expands the horizon by making environmental responsibility a core entrepreneurial objective rather than a side concern. Additionally, existing literature still shows a divide between studies focused on micro-level entrepreneurship and analyses centered on macro-level policies or institutions. To address this gap, it is essential to integrate insights from circular economy research, which highlights how SMEs can implement sustainability principles through closed-loop systems and enhanced resource efficiency (Briguglio et al., 2021; Rodríguez-Espíndola et al., 2022).

Practical and Policy Implications

The study highlights the need to empower entrepreneurs, especially in organic food SMEs, to embrace hybrid business models that combine environmental sustainability with profitability. Key strategies include using crowdfunding platforms, clearly articulating sustainability principles, and boosting stakeholder interaction to enhance market presence and organizational strength. Furthermore, empirical data from agricultural and food systems show that combining equity crowdfunding with open innovation methods can accelerate sustainability-focused innovation. However, the success of this approach relies on clear communication and active involvement of stakeholders (Troise et al., 2021). At the policy level, there is a significant necessity for comprehensive support systems that facilitate access to alternative funding sources, promote regulatory adaptability, and encourage cross-sector collaboration. Studies on institutional support frameworks indicate that both university-based entrepreneurial assistance and external institutional

backing are vital to translating green entrepreneurial intentions into action (Yi, 2021). However, the effectiveness of policies can vary significantly across geographical and institutional contexts, with facilitators and obstacles differing between startups that are inherently circular and established companies moving towards circularity (Briguglio et al., 2021; Rok & Kulik, 2021). Additionally, policies must also acknowledge the organic food industry's distinct social and cultural factors and address specific obstacles faced by underrepresented groups, such as female entrepreneurs. For example, Dahiya et al. (2020) highlight inadequate government support and limited awareness among stakeholders as the primary strategic obstacles facing women entrepreneurs in the organic food sector. They propose that targeted policy measures addressing these foundational issues could have beneficial ripple effects on related challenges, such as access to funding and market growth. Moreover, educational institutions and business incubators are crucial in equipping future green entrepreneurs. Cultivating skills in systems thinking, financial creativity, and strategic sustainability communication will be essential for providing entrepreneurs with the necessary tools to drive effective, sustainable transitions. Recent findings indicate that entrepreneurial education should focus not only on technical skills but also on aligning values and developing sensemaking abilities essential for navigating hybrid organizational logics (Reynolds & Holt, 2021). These actionable and policy insights highlight the importance of a unified ecosystem approach, where entrepreneurial innovation, supportive policy measures, and specialized education converge to promote sustainability in the organic food domain, in alignment with the emergent thematic clusters identified in the co-occurrence analysis.

Future Research Directions

Three priority research areas arise from this study's findings. First, there needs to be long-term (longitudinal) studies on sustainable business models for organic food Small and Medium Enterprises (SMEs). These studies will need to examine the development of the business model during a period when an SME is transitioning from hybrid intent to institutional embeddedness, and also the role that digital financing platforms play in supporting or hindering the SME's sustainability outcomes. Furthermore, recent advances in digital transformation and sustainable entrepreneurship suggest that digital platforms can improve eco-efficiency in e-commerce (Iqbal et al., 2025), but there remains a lack of empirical evidence on eco-efficiency among organic food small and medium-sized enterprises (SMEs). Second, multi-regional comparative studies need to occur to determine how different institutional arrangements, gender dynamics, and consumer trust mechanisms influence green entrepreneurial emergence and persistence in under-represented contexts (i.e., Africa, Latin America, and Southeast Asia); as well as how organic certification infrastructures continue to evolve in these regions. Research conducted across different countries on the adoption of a circular economy indicates that the quality of institutions, levels of economic development, and cultural influences notably affect how sustainability values relate to circular practices (Rodríguez-Espíndola et al., 2022; Urbaniec et al., 2022). This suggests that research designs tailored to specific contexts are crucial for making valid generalizations. Finally, it is important to empirically validate the integration of the circular economy within resource-constrained SME settings, using mixed-methods designs to both identify implementation barriers and document the micro-processes by which environmental commitments become operational practices. Recent studies by Briguglio et al. (2021) and Leendertse et al. (2021) on circular entrepreneurship indicate that startups integrating circular principles face unique challenges compared with established companies moving towards circularity, which affects both theoretical frameworks and practical applications. In addition to the previously mentioned areas, the field could benefit from critical examination of the "Sustainable Startup Paradox" through failure case analyses, in order to address the current survivorship bias in the literature; as well as, from gender-inclusive research designs that progress past barrier identification to include interventionist studies that document pathways to women's entrepreneurial success in the organic food sectors.

Methodological Reflections and Limitations

The study used a multi-method bibliometric approach that included Citation Network Analysis, Global Citation Score Analysis, Keyword Co-occurrence Mapping, Thematic Evolution tracking, and Three-field Plot mapping to assess the overall intellectual structure of the literature. The extended time frame (2015-2025) enabled the identification of temporal trends, while following PRISMA-guided documentation standards ensured the clarity and reproducibility of the methodology.

However, several limitations warrant acknowledgment. The first limitation is that the study was limited to English language publications indexed in Scopus, which could introduce bias related to language and database coverage. As a result, academic works from non-Anglophone regions or indexed in other databases may be underrepresented. A second limitation is that citation metrics can indicate an article's scholarly influence, but do not necessarily reflect the actual application of that knowledge in practice or its potential policy impact. Accordingly, the study cannot directly assess the real-world applicability or policy influence of the analyzed articles. A third limitation is that minimum citation thresholds were required to visualize the citation networks. These thresholds may exclude recent articles that have not yet accumulated sufficient citations, particularly those published close to the data collection date (March 2025), and therefore may not appear in the citation network visualizations.

A fourth limitation concerns the interpretive aspect inherent in bibliometric analysis. While VOSviewer, used for citation network clustering, and Biblioshiny, used for keyword co-occurrence analysis, thematic evolution, and three-field plots, rely on systematic algorithms to uncover structural patterns, interpreting these results requires analytical judgment. Specifically, researcher involvement

was essential to (1) confirm the initial algorithmic cluster allocations; (2) merge the 20 initial clusters produced by VOSviewer into six theoretically coherent thematic groups; (3) provide conceptually meaningful labels for the cluster boundaries; and (4) clarify the conceptual links among the final thematic categories. Thus, alternative yet equally valid interpretations of the same algorithmic outputs may exist.

A final limitation is that bibliometric methods tend to identify measurable structural patterns rather than provide in-depth contextual interpretation. While they effectively reveal intellectual architectures and thematic trajectories, they do not capture the substantive contextual complexity embedded within individual studies. Future research might therefore benefit from integrating qualitative or mixed-methods approaches to triangulate and theoretically refine the patterns identified in citation and keyword networks.

Conclusion

This bibliometric analysis of 157 publications (2015–March 2025) systematically mapped the intellectual structure of green entrepreneurship research within organic food SMEs, uncovering six interrelated thematic areas: sustainable business model innovation, financing green innovations, transformative entrepreneurship, circular economy strategies, institutional support systems, and hybrid business models for organic food. Citation network analysis reveals that the field has evolved from foundational theoretical concepts to empirical verification and context-specific applications, influenced by major sustainability policy frameworks such as the European Green Deal (2019) and the UN Sustainable Development Goals (SDGs).

Despite these advances, critical empirical gaps persist. Research predominantly concentrates in Western Europe and selects Asian contexts, limiting cross-contextual generalizability to Africa, Latin America, and Southeast Asia, where institutional frameworks differ significantly. Methodologically, the field relies heavily on cross-sectional studies and exhibits survivorship bias by focusing exclusively on successful cases, limiting understanding of mechanisms of sustainable business model failure and temporal development. Issues related to gender dynamics, digital transformation pathways, and the interplay between policy-entrepreneurship in emerging economies remain largely underexplored.

For researchers, this synthesis provides a structured framework for longitudinal, comparative, and context-sensitive methodologies addressing identified gaps. For policymakers, the findings underscore the need for tailored institutional support systems accounting for regional entrepreneurial ecosystem configurations, particularly in underrepresented areas. For practitioners, the analysis shows that hybrid business models and alternative financing mechanisms offer viable pathways to align sustainability goals with profitability in organic food enterprises. Advancing this research domain requires shifting from normative frameworks toward empirical validation, adopting diverse methodologies, and fostering cross-regional collaborative networks reflecting the global diversity of green entrepreneurial ecosystems.

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