

RESEARCH PAPER

# Mapping the Evolution of Sustainable Entrepreneurial Ecosystems: A Thematic Review and Research Agenda

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## ABSTRACT

In Sustainable Entrepreneurial Ecosystems (SEEs) there is a rapidly growing body of research on the entrepreneurial ecosystems, but this knowledge is still fragmented. Drawing on a core corpus of 14 publications screened from a wider set of 26 SEE-related works published between 2006 and 2026, this paper offers a focused thematic and conceptual-lineage synthesis, drawing out the development of SEE research in three aspects: theoretical foundations, conceptual development, and thematic structure. The review outlines three stages of evolution: a first one focused on economic outputs, a “sustainability turn” that incorporated environmental and social aspects and a more recent integrating journey involving systemic integration for new system-level frameworks and normative anchors beyond sustainability. Four general themes are found: the sustainability transformation of elements of the ecosystem, the increased role of entrepreneurs, the coordination of universities and intermediaries, and the measurement and evaluation of sustainable outputs. Drawing on these insights, the paper suggests an integrative research agenda that involves dynamic life cycle perspectives on SEE evolution, more in-depth understanding of governance and institutional logics, and normative grounding in thriving. The paper provides the knowledge map of the SEE field which is integrative and provides direction for the theoretical maturation of the field.

**Keywords:** sustainable entrepreneurship, research agenda, sustainable entrepreneurial ecosystems, entrepreneurial ecosystems and thematic review.

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## 1. Introduction

In the last decade, the study of entrepreneurial ecosystems (EEs) has emerged as one of the most dynamic areas within the entrepreneurship field of study. The main idea behind this concept is that entrepreneurship is not a stand-alone phenomenon but is part of a territorial system of interdependent actors, institutions and resources. From Isenberg's (2010) policy-oriented call to Stam's (2015) sympathetic critique of regional policy, from Spigel's (2017) relational organization analysis to Wurth et al.'s (2022) construction of a research program, EE research has made significant progress in both conceptual deepening and empirical accumulation. This development is extended by Audretsch et al. (2019) who examine entrepreneurship ecosystems, their economic, technological, and social impacts, and the fact that the effects of an entrepreneurial ecosystem lie far beyond the impact on the performance of individual firms to the innovation capacity of the region and social welfare.

But as EE research has developed, a new, more difficult question has come up: How can entrepreneurial ecosystems foster sustainable development, and how successful can they be? This is no coincidence. On the other hand, the normative basis of entrepreneurship research is being revisited in the light of the challenges of global environments and social inequalities. Conversely, the Sustainable Development Goals (SDGs) policy agenda has raised new legitimate expectations in entrepreneurial ecosystems. In this context, Sustainable Entrepreneurial Ecosystems (SEEs) have emerged as a new research area.

Although SEE research is making rapid strides, knowledge structure within it is highly fragmented. Current reviews cover general theoretical development of EEs without considering the sustainability aspect and/or cover the sustainability aspect without incorporating the elements of ecosystem thinking. This context contributes to the problems researchers face in understanding the

conceptual scope, the central issues and the gaps in knowledge in the SEE field. Joel et al. (2026) say that there is lacking an integrative framework that can organize the various theoretical resources and empirical findings of SEE.

This paper seeks to do this. The aim of this paper is to address three research questions: (1) what are the theoretical trajectories and conceptual foundations of SEEs? (2) How has SEE research evolved and developed thematically? (3) What are important issues that need to be addressed in further research? This paper systematically explores these questions and proposes an integrative knowledge map of the SEE field, as well as a research agenda pointing in the right direction on the basis of this map.

The next section reviews the theoretical foundations of entrepreneurial ecosystems and sustainable entrepreneurial ecosystems, tracing how the latter concept emerged from, and departed from, the former.

## 2.1 Two Lineages of Entrepreneurial Ecosystems

Theoretical foundations of EE research are the basis for understanding SEEs. In a seminal paper, Acs et al. (2017) discuss the “lineages” of the EE approach, and outline two broad theoretical currents: the regional development and strategic management literatures. The regional development lineage deals with the drivers of the spatial distribution of entrepreneurial activity, including geographic agglomeration, knowledge spillovers and institutional environment, while the strategic management lineage deals with how the acquisition of competitive advantage is achieved by the platform, network and orchestration of resources. The common ground of both lines of thinking is the notion of ecosystem thinking, which focuses on interdependence and co-evolution of actors.

But, Acs et al. quite perceptively remind the reader that both lineages have a shared deficiency, namely “the central role of entrepreneurs in value creation.” The view of entrepreneurs as passive respondents to structural conditions in regional development research is contrasted with that of strategic management research, which sees the ecosystem as a “toolbox” that firms use to access resources. The theoretical potential of the EE approach is, in fact, to address this gap, by focusing on the entrepreneurs themselves in the process of system analysis, and by recognizing the important place that systemic conditions have in the process of entrepreneurial activity.

Previous research has come closer to fulfilling this theoretical promise, albeit in varying ways. Stam

(2015) suggests the so-called “elements framework” for EEs, suggesting that institutions, networks, finance, talent, knowledge and services are determinants of EE output and stressing the complementarities and synergies between these elements. Stam and van de Ven (2021) then build and test this framework empirically, decomposing the elements of an ecosystem into separate institutional and resource dimensions, and showing that each has a different impact on the output of entrepreneurs, which provides a more disaggregated analytical basis for future SEE. In relational sociology, Spigel (2017) sees EEs as “relational organizations” that is, where culture, social networks and institutions are mutually constructed. The limitations of conceptual clarity and causal inference that Brown and Mason (2017) have identified in EE research are also noteworthy. They highlight that the “ecosystem” metaphor is not only limiting conceptual precision and theoretical development in EE, but that it is also hampering the field's ability to make causal inferences.

## 2.2 The Introduction of the Sustainability Dimension

In the mid-2010s, systematic interest in sustainability issues in EE research has started. The idea of a “sustainable valley” had been broached by Cohen (2006) before, but it was economic sustainability, and not environmental or social sustainability, that was the focus. The actual watershed occurred when the concept of “sustainable entrepreneurial ecosystems” was explicitly marked as “an emerging field of research” by Volkmann et al. (2021). They say that the fundamental problem posed by SEEs is “how can ecosystems be maintained in the long-term within ecological limits and how can sustainable entrepreneurship be supported, that is entrepreneurial activities that “address environmental or social problems as entrepreneurial opportunities”?”

It suggests two different levels of analysis: ‘output sustainability’ of the ecosystem, which has to do with the (positive) environmental and social impacts of the entrepreneurial activities it supports, and ‘process sustainability’ of the ecosystem, which has to do with the long-term sustainability of the various institutions and resource flows of the system. The concept of “thrivability” takes the discussion further than “sustainability,” a defensive concept, suggesting a new normative concept for systems: “thrivability” means they do not just do no harm, they promote the prosperity of all stakeholders (Moggi et al. 2022).

## 2.3 The Sustainability Turn in Theoretical Lineages

In terms of theoretical lineages, the evolution of SEEs can be seen as a “common turn” of the two EE lineages towards sustainability issues. The lineage of regional development is “sustainability” oriented and can be recognized by its takeup from the literature on “green regional innovation systems” and “sustainable transitions”. Tiba et al. (2021) found that the geographic distribution of sustainable entrepreneurial ventures is determined and strongly affected by the institutional environment, knowledge bases and policy support in the region, which in turn are different systematically from the drivers of general entrepreneurial ventures. This discovery suggests that the EE elements framework must be “contextualized” for SEEs, since some elements are not relevant to the general analysis of EE but take on a crucial role in SEEs (e.g. environmental regulation, green market demand, and financing instruments for sustainability).

The transformation of the strategic management lineage in the context of sustainability can also be seen in its focus on “sustainable business model innovation” and “institutional entrepreneurship”. According to systematic review done by Chaudhary et al. (2023), the four themes that are identified are: (1) becoming more sustainable, (2) the role of the entrepreneur, (3) the role of the university, and (4) the outputs of sustainable ecosystems. A key theme is the role of entrepreneurs with a special focus on entrepreneurs’ ability as ‘institutional agents’ who are not just adapting to ecosystem conditions, but are also actively influencing those conditions by innovating a sustainable business model. This approach shifts the focus of SEE research from one of structural determinism to a dialectical perspective of “structure and agency.”

### 3. Research Methods

#### 3.1 Literature Search and Screening Strategy

The method used in this paper is a structured thematic and conceptual-lineage review, informed by systematic review principles of transparency and reproducibility. An initial corpus of 26 publications addressing entrepreneurial ecosystems (EEs) and sustainable entrepreneurial ecosystems (SEEs) was compiled from leading entrepreneurship, innovation, and management journals published between 2006 and 2026 (e.g., *Small Business Economics*, *Journal of Business Research*, *Business Strategy and the Environment*, *Journal of Cleaner Production*, and *Review of Managerial Science*). Given the corpus size, this review is best characterized as a focused

synthesis of foundational and high-impact SEE contributions rather than an exhaustive database-driven systematic review; it does not claim comprehensive coverage of the wider EE/SEE literature.

The literature screening is based upon three criteria: (1) direct involvement with the interplay of EE and sustainability; (2) substantive contribution to the theory, concepts, or methods of EE or SEE; and (3) publication in peer-reviewed journals. Applying these criteria, 12 publications were excluded for either addressing entrepreneurial ecosystems without a substantive sustainability dimension or making only passing reference to SEE concepts; the remaining 14 publications form the core corpus for the thematic and lineage analysis in Sections 4 and 5, while the full set of 26 is drawn on for background and contextual framing throughout the paper.

#### 3.2 Analytical Framework

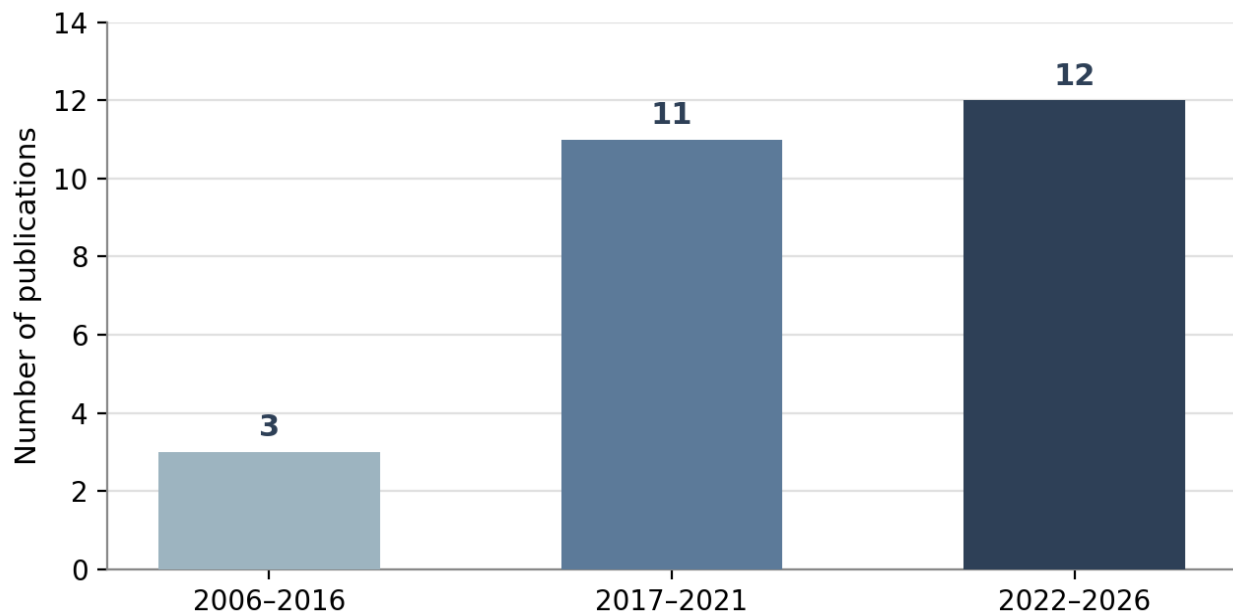
This paper uses a mixture of thematic analysis and conceptual lineage analysis. Thematic analysis is employed to identify core issues and research findings that recur across the literature, conceptual lineage analysis is employed to trace the evolution of key concepts (such as “sustainability”, “thrivability” and “ecosystem elements”) and the origins of these concepts within these theories. These two strategies help the paper to strike a balance between describing the synthesis and constructing an explanation. To reduce coding subjectivity, the two authors independently coded the core corpus against the emerging stage and theme categories described in Section 4, then met to compare codes and resolve disagreements through discussion; where interpretations diverged, the underlying text was re-examined jointly until consensus was reached.

#### 3.3 Overview of Literature Characteristics

The 26 publications analyzed in the year range between 2006 and 2026, with 3 publications published during 2006 - 2016, 11 publications during 2017 - 2021 and 12 publications during 2022 - 2026, which shows an increasing trend in SEE research. Regarding journal outlets, *Small Business Economics* and *Journal of Business Research* are the main journals but there has been a proliferation of related research in entrepreneurship, innovation, and management and sustainability journals. With respect to the methodological approach most of the papers are conceptual/review (about 50%), while most of the empirical papers are qualitative, and the large scale quantitative studies are still relatively few in number.

**Table 1. Distribution of Reviewed Publications by Time Period (N = 26)**

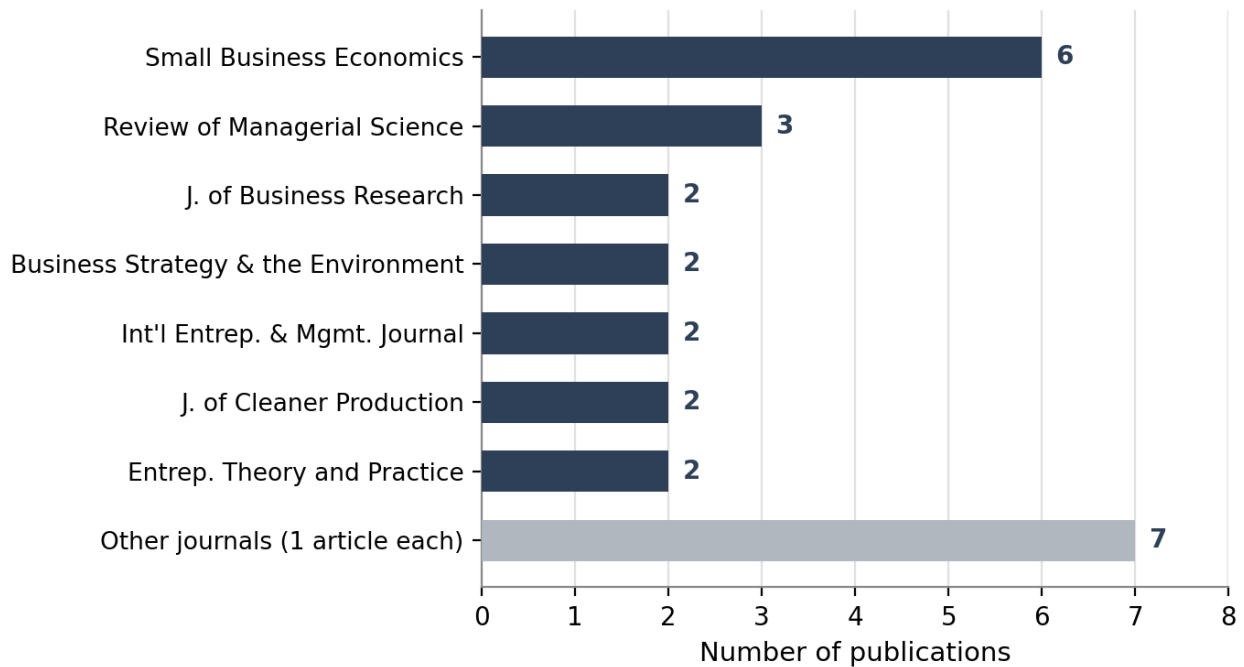
| Period    | No. of Publications | Share of Total | Dominant Focus                                                                        |
|-----------|---------------------|----------------|---------------------------------------------------------------------------------------|
| 2006–2016 | 3                   | 11.5%          | Foundation accumulation; sustainability as a marginal add-on to general EE frameworks |
| 2017–2021 | 11                  | 42.3%          | Self-conscious construction of SEEs as an independent research field                  |
| 2022–2026 | 12                  | 46.2%          | Systemic integration; holistic, normatively-grounded frameworks                       |

**Figure 1. Growth in SEE-Related Publications by Period (n = 26)***Figure 1. Growth in SEE-related publications by period (N = 26).***Table 2. Distribution of Reviewed Publications by Journal (N = 26)**

| Journal                                               | No. of Articles |
|-------------------------------------------------------|-----------------|
| Small Business Economics                              | 6               |
| Review of Managerial Science                          | 3               |
| Journal of Business Research                          | 2               |
| Business Strategy and the Environment                 | 2               |
| International Entrepreneurship and Management Journal | 2               |
| Journal of Cleaner Production                         | 2               |

|                                                                                                                                                                                                                 |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Entrepreneurship Theory and Practice                                                                                                                                                                            | 2 |
| Other journals (1 article each: Journal of Technology Transfer, Harvard Business Review, Industry and Innovation, Research Policy, Urban Studies, European Planning Studies, Journal of Innovation & Knowledge) | 7 |

**Figure 2. Distribution of Reviewed Publications by Journal**



*Figure 2. Distribution of reviewed publications by journal (N = 26).*

#### 4 The Evolutionary Trajectory and Thematic Structure of SEE Research (4. Findings)

##### 4.1 Three-Stage Evolutionary Model

This paper outlines the trend of SEE research over the past few years by analyzing the 26 publications through time series and sees the three stages of evolution.

##### Stages One: Foundation Accumulation (2006-2016)

This stage involves integrating sustainability concerns into current EE programs but does not require the development of new EE programs. Cohen's (2006) 'sustainable valley' approach is a first step in this direction, which extends the traditional entrepreneurial system analysis with an environmental component. The works of Isenberg (2010) and Stam (2015) are mostly theoretical in nature and sustainability is only an additional focus. Mack and Mayer (2016)'s study of EE evolutionary dynamics is an important temporal perspective for

further SEE analysis, but it is still confined to economic aspects of evolution.

##### Stage Two: The Sustainability Turn (2017-2021)

A central feature of this stage is the emergence of the self-reflexive creation of the concept of a sustainable entrepreneurial ecosystem as a trans-disciplinary research field. While Cavallo et al.'s (2021) review remains focused generally on EEs, the discussion of "future directions" starts to explore issues of sustainability. In their programmatic paper, Volkmann et al. (2021) explicitly describe SEEs as an "emerging field of research," and so the academic community has formally recognized the uniqueness of SEEs. In the meantime, the dynamic lifecycle model (Cantner et al., 2020) was proposed as a theoretical instrument for understanding EE evolution; later it will be shown how much it will be relevant to SEE analysis. This empirical study by Tiba et al. (2021) is the first to systematically investigate differences between sustainable

entrepreneurial ventures in different ecosystems and their drivers.

**The third and final stage is Systematic Integration (2022-2026).**

At this stage, attempts are made to build SEEs in a “holistic” manner in theory. Theodoraki et al (2022) explicitly suggest a “holistic approach” with a focus on embedding all three aspects of economics, environment, and society within a single analytical framework for an ecosystem. At the normative level,

there is a deepening from “reducing harm” to “promoting prosperity” in the work of Moggi et al. (2022) on “thrivability.” There are several systematic representations of the thematic organization of this stage, with the one by Chaudhary et al. (2023) offering the most systematic representation (77 publications). The current reviews by Joel et al. (2026) and Stroila et al. (2026) continue the positive trend of SEEs as a well-established research domain and meta-level discussion of the “schools of thought” and “topical trends” in SEE research.

**Table 3. Three-Stage Evolutionary Model of SEE Research**

| Stage                      | Period    | Defining Characteristic                                                                                 | Representative Studies                                                                                            |
|----------------------------|-----------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 1. Foundation Accumulation | 2006–2016 | Sustainability attached to existing EE frameworks as a marginal concern                                 | Cohen (2006); Isenberg (2010); Stam (2015); Mack & Mayer (2016)                                                   |
| 2. Sustainability Turn     | 2017–2021 | Self-conscious construction of SEEs as a distinct research field                                        | Cavallo et al. (2021); Volkmann et al. (2021); Cantner et al. (2020); Tiba et al. (2021)                          |
| 3. Systemic Integration    | 2022–2026 | Holistic integrating economic, environmental, and social dimensions; deepening frameworks and normative | Theodoraki et al. (2022); Moggi et al. (2022); Chaudhary et al. (2023); Joel et al. (2026); Stroila et al. (2026) |

**4.2 Four Core Themes**

The literature is content analyzed and four main thematic areas of SEE research are identified:

**Theme one is: Sustainability Transformation of Ecosystem Elements.**

This theme will look at the “reconfiguration” of traditional EE elements (finance, talent, knowledge, markets, and institutions) that supports sustainable entrepreneurship. Huang et al. (2023) directly addresses the question of what elements of the entrepreneurial ecosystem can foster sustainable entrepreneurship, identifying environmental regulations, green market demand and sustainable financial instruments as distinct factors that go beyond the entrepreneurial ones. The research conducted by Aliabadi et al. (2022) on the startups in agriculture shows that the elements have relational networks, which means that the “combinatorial effects” of elements are greater than the “independent effects” of individual elements.

**Theme Two: Expanded role of entrepreneurs.**

In traditional EE studies, entrepreneurs are considered as “beneficiaries” or “responders” in the system, whereas in SEE studies, entrepreneurs are given more agentic roles. According to the thematic

analysis of Chaudhary et al. (2023), the sustainable entrepreneurs hold three different roles, namely, “opportunity recognizers,” “institutional agents,” and “value creators.” They bring value to sustainable markets, while at the same time disrupting and redefining institutional structures in these markets by their entrepreneurial conduct, thereby contributing to ecological and social value added.

**Theme Three: Co-ordinating Function of University and Intermediaries.**

This research on family firm embeddedness by Bichler et al. (2022) highlights the importance of “local actors” in SEE. The horizontal embeddedness (economic and socio-political context), vertical embeddedness (industry regime and family), and spatial embeddedness (region) make family firms special and unique “anchor organizations” in SEEs. In addition, universities, as knowledge producers and SE education centers, have become an increasingly important part of SEEs. Scott et al. (2022) highlight the role of the intermediate actors as links between scattered actors, knowledge transfer and coordination of collective action.

**Theme Four: Sustainable Outputs Measurement and Evaluation.**

While the focus of Leendertse et al.'s (2022) “Measure twice, cut once” is on general EE metrics, the methodological implications are of great value for SEE measurement. Tiba et al. (2021) directly tackle the measure of sustainable entrepreneurship by studying “the share of sustainability startups across

entrepreneurial ecosystems” and its drivers. Queissner et al. (2024) conduct a second systematic review of the quality of the links between elements of EE and entrepreneurial activity, which provides a methodological basis for causal inference in SEEs.

**Table 4. Four Core Themes of SEE Research**

| Theme                                                       | Core Focus                                                                                                         | Representative Studies                                                |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 1. Sustainability transformation of ecosystem elements      | How finance, talent, knowledge, markets, and institutions are reconfigured to support sustainable entrepreneurship | Huang et al. (2023); Aliabadi et al. (2022)                           |
| 2. Expanded role of entrepreneurs                           | Entrepreneurs as opportunity recognizers, institutional agents, and value creators (beyond passive responders)     | Chaudhary et al. (2023)                                               |
| 3. Coordinating function of universities and intermediaries | Family firms, universities, and intermediaries as anchor organizations coordinating actors and knowledge flows     | Bichler et al. (2022); Scott et al. (2022)                            |
| 4. Measurement and evaluation of sustainable outputs        | Metrics and causal inference strategies for output vs. process sustainability                                      | Leendertse et al. (2022); Tiba et al. (2021); Queissner et al. (2024) |

#### 4.3 Key Debates and Conceptual Tensions: Key debates and conceptual tensions:

Over the years, the SEE field has developed and a number of key debates have arose that can be classified as knowledge tension for further development:

##### 4.3.1 Debating the definition of “Sustainability.”

There are notable variations in the definitions of sustainable entrepreneurship in the literature, ranging from a broad definition, which can be considered as “entrepreneurial activity that contributes to sustainable development” to a narrow one, which may be considered as “entrepreneurial activity centred on environmental problems as opportunities”. This definitional distinction has implications for research design, measurement strategies and policy implications.

There is a tension between sustainability and thriving that needs to be addressed. The concept of thriving, put forward by Moggi et al. (2022), questions the hegemony of ‘sustainability’ as the main normative reference. The two concepts of sustainability and thriving are both in service of “keeping the system from collapsing” and “promoting system prosperity.” This tension resonates with the basic normative orientation of SEE research: to do no harm or to actively promote?

##### 4.3.2 The Structure/Agency relationship.

While Acs et al. (2017) argue that entrepreneurs should be the focus of analysis, the SEE research in practice remains structural based. The question of how to integrate the concept of “ecosystem conditions” and “entrepreneurial agency” at the methodological level is still not sufficiently addressed.

#### 5. Research Agenda

From the above analysis, this paper puts forward the following research agenda: to make step forward of SEE research from “field formation” to “theoretical deepening”. This course focuses on the mechanisms driving the dynamic evolution of SEEs, such as their lifecycle and transition pathways.

While Cantner et al.'s (2020) dynamic lifecycle model will lay an important theoretical groundwork for SEE research, it still needs to be corrected for sustainability problems. Future studies should focus on the following: How do SEEs become more “traditional EEs”? What are the “must-haves” and “must-nots” for transition? What are each of the sustainability dimensions and how do they differ in significance in the various stages of the lifecycle (from formation, growth, maturity, decline, to rebirth)? These questions are best addressed by using the longitudinal case studies as well as computer simulation methods.

A second priority is the development of cross-contextual indicators for SEEs, since existing

measurement approaches have not kept pace with the field's conceptual development.

Current EE indicators, such as REDI and GEI, do not properly reflect sustainability aspects. Future studies should further proceed in the following directions: creating composite indicators that will be able to differentiate and distinguish “output sustainability” from “process sustainability” and to investigate the cross-contextual validity of indicators (which indicators are applicable across developed and emerging economies and which require contextualization); and using the causal inference strategies as proposed by Tiba et al. (2021) to create causal evidence between SEE indicators and sustainable outputs.

The political economy of SEEs is shaped by governance and institutional logics, which are defined by the extent to which they are coordinated and conflictual.

Multiple actors (government, firms, universities, civil society) are required to coordinate the effective functioning of SEEs. But actors may act based on conflicting institutional logics: a conflict between market logic and state logic, community logic and green logic can become barriers to SEE development. Digitalisation is an additional element of the coordination challenge, as it transforms governance

structures and catalyses new actor combinations in interconnected ecosystems (Bouncken and Kraus 2021). Future research needs to build on institutional logic theory and governance research to look at: Is there any particular “sustainable governance models” in SEEs? What are the “translation” and “coordination” roles of intermediaries and platforms in logic conflicts, especially in the context of the growing mediation of relations by digital platforms?

A fourth priority is to deepen the field's normative foundation, moving from sustainability as a defensive, harm-avoiding standard toward thriving as a more robust basis for evaluating SEE outcomes.

Moggi et al. (2022) suggest a new avenue for research in their thriving framework that has not been fully explored. What would be the implications for evaluating “good ecosystems” in the event that the normative objective of SEEs moved beyond sustainability to “thriving”? How do we make thriving measurable? How does it link to the SDGs? The answers to these questions will demand SEE research to surpass descriptive analysis and enter the theoretical construction of a norm. Table 5. Key Debates and Conceptual Tensions in SEE Research.

| Debate                      | Core Tension                                                                                                    |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------|
| Defining “sustainability”   | Broad (contributes to sustainable development) vs. narrow (environmental problems as opportunities) definitions |
| Sustainability vs. thriving | “Do no harm” (keeping the system from collapsing) vs. “actively promote” (system prosperity)                    |
| Structure vs. agency        | Structural determinism vs. entrepreneurs as institutional agents reshaping ecosystem conditions                 |

**Table 6. Summary of the Proposed Research Agenda**

| Priority                                | Focus                                     | Key Question                                                                                                    |
|-----------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| 5.1 Dynamic evolutionary mechanisms     | Lifecycle and transition pathways of SEEs | How do SEEs transition from traditional EEs, and how does sustainability's role shift across lifecycle stages?  |
| 5.2 Measurement and evaluation          | Cross-contextual indicators               | How to distinguish output vs. process sustainability, and build indicators valid across contexts?               |
| 5.3 Governance and institutional logics | Coordination and conflict among actors    | Do unique sustainable governance models exist, and how do intermediaries resolve institutional logic conflicts? |
| 5.4 Sustainability to thriving          | Normative foundation                      | How can thriving be operationalized, and how does it relate to the SDGs?                                        |

|                               |                                        |                                                                                                |
|-------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------|
| 5.5 Methodological innovation | Mixed methods and longitudinal designs | How can fsQCA, longitudinal case studies, and cross-level models advance causal understanding? |
|-------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------|

## 6. Limitations

This review has several limitations that should be considered when interpreting its findings. First, the corpus of 26 publications, narrowed to 14 for detailed thematic analysis, is small relative to the wider entrepreneurial ecosystem literature; the review therefore prioritizes analytical depth on foundational and highly cited works over exhaustive coverage, and some relevant contributions may not be represented. Second, the corpus was not compiled through a fully documented database search (e.g., a specified Boolean query across Scopus or Web of Science with a PRISMA-style flow of records identified, screened, and excluded); rather, publications were selected purposively against the three screening criteria described in Section 3.1. Future reviews would benefit from a broader, database-driven search strategy with a transparent screening flow and independent double-coding of themes to strengthen reliability. Third, the review draws predominantly on English-language journal articles, which may under-represent SEE scholarship published in other languages or in books, conference proceedings, and policy reports. These limitations suggest that the three-stage evolutionary model and four core themes proposed here should be read as an organizing framework to be tested and refined by subsequent, more comprehensive reviews rather than as a definitive map of the field.

## 7. Conclusion

The aim of this paper is to systematically review the evolution of the phenomenon of sustainable entrepreneurial ecosystem research. The study reveals that SEEs have become a research field with clear theoretical identity from being a marginal research concern. It has gone through three phases in evolution: “economic centrism”, “sustainability turn” and “systemic integration”. The basic knowledge structure in the field is divided into four core themes: element transformation, entrepreneurial roles, coordinating functions and measurement and evaluation. Concurrently, the question of definition of “sustainability”, the “normative tension” between “thrivability and sustainability and the “structural agency” approach are important knowledge issues for development of the field.

This paper outlines a research program that involves concurrent development of SEE research in three

areas: deepening theory, innovation in methodology, and the development of norms. The study of dynamic evolutionary mechanisms will strengthen the explanatory power of the field; the further development of measurement and evaluation will add to the cumulative nature of research in the field; the analysis of governance and institutional logics will tie SEE research to more generalized organizational and institutional theory; and the normative deepening from sustainability to thrivability will give the field a firmer ethical underpinning.

The field of SEE is at a pivotal moment in its development: the theoretical resources and empirical evidence gathered have reached a level of maturity from which they can progress to a more developed understanding of the linkages between entrepreneurship, sustainability and systemic change. The development of entrepreneurship theory and the provision of a knowledge base for solving the most urgent problems of sustainable development in the 21st century will be another result of this shift.

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