



RESEARCH ARTICLE

Connecting the dots? Entrepreneurial ecosystems and sustainable entrepreneurship as pathways to sustainability

Sanjay Chaudhary¹  | Puneet Kaur^{2,3,4} | Hind Alofaysan⁵ | Jantje Halberstadt⁶ |
Amandeep Dhir^{4,7,8} 

¹O.P. Jindal Global University, Sonapat, India

²Department of Psychosocial Science, University of Bergen, Bergen, Norway

³Jaipuria Institute of Management, Lucknow, India

⁴Optentia Research Focus Area, North-West University, Vanderbijlpark, South Africa

⁵Department of Economics, College of Business and Administration, Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia

⁶University of Vechta, Vechta, Germany

⁷Department of Management, School of Business & Law, University of Agder, Kristiansand, Norway

⁸Jaipuria Institute of Management, Noida, India

Correspondence

Amandeep Dhir, Universitetsveien 19, Kristiansand, Norway.
Email: amandeep.dhir@uia.no

Funding information

Deanship of Scientific Research at Princess Nourah bint Abdulrahman University

[Correction added on 16 June 2023, after first online publication: The third author's last name has been corrected in this version.]

Abstract

While the exponential growth of entrepreneurial ecosystem research has dramatically increased our understanding of the role of context in entrepreneurial outcomes, our knowledge of entrepreneurial ecosystems and environmentally sustainable entrepreneurship is still fragmented. There is ambiguity on how entrepreneurial ecosystems influence sustainable entrepreneurship and what factors facilitate or constrain sustainable entrepreneurship. We attempt to take stock of the extant scholarship on entrepreneurial ecosystems and synthesize studies examining their linkages with sustainability. We systematically reviewed 77 articles identified in the World of Science and Scopus databases to discuss the main themes. The content analysis uncovered four key themes: (a) how entrepreneurial ecosystems become more sustainable, (b) the role of entrepreneurs, (c) the role of universities, and (d) the outcomes of sustainable ecosystems. The findings reveal that interactions between different actors, including customers, suppliers, institutions, governments, and universities, can result in a sustainable entrepreneurial ecosystem. The novelty of our study arises from integrating extant studies on entrepreneurial ecosystem and sustainability in a systematic and replicable manner. We observed heightened attention to the environmental challenges in ecosystem literature and entrepreneurs' expanded roles in generating ecological and social value. Future studies can further evaluate the effectiveness of entrepreneurial ecosystems to examine whether creating an entrepreneurial ecosystem has a similar value while achieving sustainable development goals across varied contexts.

KEYWORDS

ecosystem, entrepreneurs, sustainability, sustainable entrepreneurial ecosystem, sustainable entrepreneurship, systematic literature review

Abbreviations: PRQ, potential research questions; RQ, research questions; R&D, research and development; SDG, sustainable development goals; SLR, systematic literature review; UN, United Nations.

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2023 The Authors. Business Strategy and The Environment published by ERP Environment and John Wiley & Sons Ltd.

1 | INTRODUCTION

Debates on sustainability have broadened from environmental management to the domain of entrepreneurship (e.g., Laveren et al., 2020; Moya-Clemente et al., 2020; Pankov, Velamuri, & Schneckenberg, 2021). Scholars have observed the influential role of entrepreneurs in addressing environmental challenges and achieving UN sustainable development goals (SDGs; Cohen, 2006; Theodoraki et al., 2018; Tipu, 2021). There is an agreement that entrepreneurial activities are crucial to tackling grand challenges such as poverty, reducing energy consumption and carbon emissions, and achieving triple-bottom-line goals (Pacheco et al., 2010). However, while broader sustainability issues like climate change pinpoint the role of entrepreneurs (Terama et al., 2016), the question remains: What specific factors favor sustainable entrepreneurship? Scholars are trying to understand external factors favorable to sustainable ventures (Moggi et al., 2021; van Rijnsoever, 2022). Financially viable sustainable ventures remain a tricky proposition as these ventures suffer from institutional constraints and need significant investments to develop technological expertise (Hoogendoorn et al., 2019).

Sustainable entrepreneurship calls for supporting mechanisms in the ecosystem (Muñoz & Cohen, 2018; Volkmann et al., 2021). The success of sustainable ventures depends upon a favorable external environment that stimulates knowledge transfer and technology development throughout a region (Awan et al., 2021). Cohen (2006) pioneered the conceptualization of a sustainable entrepreneurial ecosystem focusing on environmental, social, and economic factors that result in sustainable development. The author posited that support from the ecosystem results in leveraging sustainable opportunities and developing sustainability-based business models. A sustainable entrepreneurial ecosystem enables the interaction of actors and resources, resulting in knowledge sharing and driving entrepreneurial action (Stam, 2015; Tiba et al., 2021) and, ultimately, supporting sustainable entrepreneurship within a region (Theodoraki et al., 2022). The recognition of opportunities by actors who can create new markets enables the ecosystem to be sustainable (Neumeier & Santos, 2018; Simatupang et al., 2015). In brief, the sustainable entrepreneurial ecosystem emphasizes the crucial role of participating actors toward a long-term commitment to regional development with specific goals, including employment generation and productive entrepreneurship, by forging coalitions with institutions (Acs et al., 2017).

Given the growing research interest in sustainable entrepreneurial ecosystems (Bischoff, 2021), reflecting on the accumulated knowledge and current gaps in the literature is important. While we noted that the linkage of entrepreneurial ecosystems to sustainability pinpoints the crucial responsibility of actors toward the ecological environment—which in turn facilitates sustainable entrepreneurship development (Theodoraki et al., 2018)—prior studies have failed to provide an overview of their genesis and outcomes (Ferasso et al., 2020; Spigel, 2017). Moreover, there is a lack of a framework that explains cause-and-effect relationships (Volkmann et al., 2021), and the prior literature examining the relationships between

sustainable entrepreneurial firms and various actors is still fragmented (Simatupang et al., 2015; Suchek et al., 2021). Thus, some ambiguity remains regarding how various actors systematically facilitate sustainability (Bischoff & Volkmann, 2018; Malecki, 2018), what role different actors play in its development (Volkmann et al., 2021), and what boundary conditions influence the relationships mentioned above. Finally, the extant research on sustainable entrepreneurial ecosystems fails to address the costs and benefits of sustainable ecosystems (Cunningham et al., 2019), and it is unclear how entrepreneurial ecosystems promote the achievement of SDGs (Volkmann et al., 2021).

In brief, it is critical to systematically review how entrepreneurial ecosystems facilitate sustainability goals (Cohen & Winn, 2007; Pankov, Schneckenberg, & Velamuri, 2021). While the prior literature has identified the linkages between the entrepreneurial ecosystem and sustainability research (Bischoff, 2021; Bischoff & Volkmann, 2018; Simatupang et al., 2015), we observe a lack of an overview of the contextual factors that influence sustainable entrepreneurship. To the best of our knowledge, reviews synthesizing existing literature on sustainable entrepreneurial ecosystems are sparse (see Theodoraki et al., 2022; Volkmann et al., 2021). Accordingly, additional research is needed to provide an overview of the interactions between various ecosystem elements that results in sustainability outcomes (Fernandes & Ferreira, 2022). Therefore, we seek to understand the following research questions: **RQ1.** What is new about sustainable entrepreneurial ecosystem? **RQ2.** What are the existing findings on the intersection of entrepreneurial ecosystem and sustainability? **RQ3.** How is sustainable ecosystem research different from traditional ecosystem research?

We perform a systematic literature review (SLR) that aims to (a) elucidate the findings of the current literature on entrepreneurial ecosystem and sustainability, (b) synthesize current findings on the causal mechanisms in entrepreneurial ecosystems, and (c) develop a conceptual model on how entrepreneurial ecosystems can contribute to sustainability outcomes across levels. Our review articulates the different perspectives on this topic, revealing the current understanding of how sustainable entrepreneurship may come about through interactions between actors and contributing to the literature by (a) summarizing existing research on the intersection of entrepreneurial ecosystems and sustainable development and summarizing the literature on the genesis and outcomes of sustainable entrepreneurial ecosystems, (b) proposing an agenda for future research, and (c) theorizing a conceptual framework linking entrepreneurial ecosystems with sustainability at the firm and macro levels.

Our study is organized as follows: Section 2 presents the scope of the review covering entrepreneurial ecosystem and the association between sustainable entrepreneurship and entrepreneurial ecosystems. Section 3 covers the research methodology and research profile of the candidate studies. Section 4 presents the findings of the thematic analysis that results in the development of a research framework, which is presented in Section 5. Finally, Section 6 presents the discussion section covering the theoretical contributions and practical significance of the study and concludes with various study limitations and directions for future studies.

2 | SCOPE OF THE REVIEW

2.1 | The entrepreneurial ecosystem

The conceptualization of the entrepreneurial ecosystem as an interaction between individual actors, institutions, and civil society engaged in entrepreneurial activities has been garnering increasing attention in the extant literature (Audretsch et al., 2019; Kansheba & Wald, 2020; Scott et al., 2021). Entrepreneurial ecosystems play a crucial role in enabling creative innovation and destruction (Filser et al., 2021; Ritala et al., 2018; Stam & van de Ven, 2021). The use of the term *ecosystem* stems from biology, which refers to the interactions between organisms and the physical environment (Cavallo et al., 2019). Scholars conceptualize an entrepreneurial ecosystem as a *biotic community* (Acs et al., 2017).

Entrepreneurial ecosystem research is related to multiple research areas, for example, clusters (Delgado et al., 2010), business ecosystems (Adner, 2017), and regional innovation systems (Carayannis et al., 2018). These studies have focused on regional agglomerations and encompass the interactions between resources, cultures, and institutions to measure and assess entrepreneurial performance. However, an entrepreneurial ecosystem differs from clusters, which focus on firms that employ similar technologies within particular geographies (e.g., Feldman et al., 2005). Likewise, an entrepreneurial ecosystem is different from a business ecosystem as an entrepreneurial ecosystem has specified boundaries while a business ecosystem does not. Similarly, the entrepreneurial ecosystem-specific focus is on entrepreneurs and productive entrepreneurship (Alvedalen & Boschma, 2017; Theodoraki et al., 2022; Wurth et al., 2021).

Cho et al. (2021) emphasized the crucial role of an evolutionary lens in entrepreneurial ecosystem. The four major components of the entrepreneurial ecosystem are *place, governance, actors, and evolution*. Stam (2015) defined an entrepreneurial ecosystem as an interdependent set of actors enabling entrepreneurial actions. The author highlighted the inter-relatedness between existing and new firms in the ecosystem, taking the perspective of a dynamic life cycle.

We noted a growing body of recent reviews on entrepreneurial ecosystems (Wagner et al., 2021). Wurth et al. (2021) identified important factors deemed necessary for understanding entrepreneurial ecosystems and argued that interactions between elements of the entrepreneurial ecosystem result in entrepreneurial output. The authors linked entrepreneurial ecosystems with productive entrepreneurship, demonstrating their contribution to the economy. They further argued the crucial role of actors in the entrepreneurial ecosystem as drivers of creative destruction. By emphasizing productive entrepreneurship as the unit of analysis, the crucial role of actors and elements of an ecosystem is theorized. Fernandes and Ferreira (2022) reviewed the role of networks. The authors noted four predominant trends: the role of context, the importance of networks, challenges for actors, and the role of formal structure. Recently, Theodoraki et al. (2022) conducted a bibliometric analysis and identified three major clusters: the foundation, structure, of the sustainable entrepreneurial ecosystem and the interaction between actors.

In brief, there is a recognition that entrepreneurial opportunities and success do not happen in a vacuum as entrepreneurs are embedded within the geographical context of their particular local, national, or even global economy (Cohen, 2006; Scott et al., 2021). Entrepreneurial success depends on contextual support factors, for example, legal, institutional, cultural, and interconnected actors such as entrepreneurs, universities, incubators, financial institutions, governments, and many others (Ács et al., 2014; Ács et al., 2017; Bischoff, 2021; Fernandes & Ferreira, 2022; Hanlon & Saunders, 2007; Welter, 2011).

2.2 | Sustainable entrepreneurship and entrepreneurial ecosystem

While entrepreneurship is a mix of attitudes, resources, and infrastructure resulting in exploring and exploiting new opportunities (Patzelt & Shepherd, 2011; Qian et al., 2013; Shane & Venkataraman, 2000), sustainable entrepreneurship is about discovering and exploiting opportunities that support preserving the natural environment and providing economic gains (Belz & Binder, 2017; Muñoz & Cohen, 2018). Recently, sustainable entrepreneurship has attracted interest in the literature due to the growing pressure of societal challenges (Cohen & Winn, 2007; Johnson & Schaltegger, 2020; Patzelt & Shepherd, 2011). There is an emerging view on the crucial role of entrepreneurship in social welfare and achieving UN SDGs (Ferasso et al., 2020; Thees et al., 2020). The United Nations' agenda underlines the need for sustainable entrepreneurship to act on issues related to sustainability and its impact on financial, ecological, and social goals (Liu & Stephens, 2019; Moggi et al., 2021).

The fundamental idea of a sustainable entrepreneurial ecosystem is to create an environment supporting eco-innovation, enabling the formation of new ventures focusing on sustainability outcomes within a specified region (Theodoraki et al., 2022). The sustainable entrepreneurial ecosystem differs from a conventional one because it enables entrepreneurial firms' longevity by addressing various sustainability concerns, such as allowing resource efficiency and reducing environmental load (Tolstykh et al., 2021). It involves employing a collaborative approach to innovation and a broader interaction with the environment and various stakeholders committed to supporting and facilitating sustainable entrepreneurship within a community instead of merely focusing on economic gains (DiVito & Ingen-Housz, 2021; Dorado, 2006). A sustainable entrepreneurial ecosystem balances a particular geography's environmental, social, and financial objectives.

There is an ongoing debate in the academic literature on how and why entrepreneurial ecosystem research needs to be connected to sustainability outcomes, which is centered on a few main issues. First, with the increasing pressure of societal challenges, including scarcity of potable water, the decline in the air quality index, and climate change, researchers have begun investigating the peculiarities of entrepreneurial ecosystems (Raposo et al., 2021). In particular, there is a concern that sustainability-related challenges are too overwhelming

and cannot be tackled in isolation. As stakeholders' divergent goals require coordinated action, it is important to understand the role of entrepreneurs and other actors in an ecosystem (Raposo et al., 2020). Second, scholars agree that cultural factors drive sustainable entrepreneurship within a region; therefore, the interaction between actors (e.g., entrepreneurs, universities, and other institutions) is crucial (Theodoraki et al., 2018). Third, infrastructure and support services are critical drivers of sustainable entrepreneurship (Tiba et al., 2020). Finally, scholars argue that limited attention has been paid to the essential role of the sustainable entrepreneur in the entrepreneurial ecosystem (Volkman et al., 2021). In brief, conceptualizing sustainable entrepreneurial ecosystems shifts the inquiry toward territorial models of sustainability outcomes. Situating sustainable entrepreneurship as a specific research agenda allows for the examination of how the linkages within networks affect sustainable new value creation at the firm and regional levels (Fernandes & Ferreira, 2022; Grigore & Dragan, 2020; Laveren et al., 2020; Shvetsova & Lee, 2021). Figure 1 exhibits the conceptualization of a sustainable entrepreneurial ecosystem.

3 | METHODOLOGY

SLR methodology refers to a transparent and replicable form of review that aims to identify, consolidate, and critically analyze the existing research gaps (Awan et al., 2021; Siddaway et al., 2019). SLRs enable the creation of new knowledge by systematizing varied perspectives (Torraco, 2016). Research questions are presented to guide a systematic review (Kraus et al., 2021). The key objective of the present SLR is to evaluate how the literature on entrepreneurial

ecosystems and sustainability has evolved and to identify avenues for future research (Bacq et al., 2021; Talwar et al., 2022). The present study followed the procedure for planning, conducting, and reporting its findings that was laid out by (Tranfield et al., 2003) and used in other recent studies (e.g., Calabrò et al., 2019; Kaur et al., 2020; Kushwah et al., 2019).

Our study involves three main steps. In step one, we specified our research objectives and identified three research questions. To address **RQ1**, we defined a search protocol to identify relevant studies and generated a research profile. We elucidated the search protocol to set conceptual boundaries for our review. A data collection methodology follows this. We specified the search protocol and reporting of findings described below (Behera et al., 2019). In the next step, we addressed **RQ2** by performing content analysis of the identified studies to synthesize common themes. Later, we uncovered the visible gaps in the literature and proposed possible future research avenues for each of the thematic areas of research. We further proposed a conceptual framework providing an overview of the findings.

First, to obtain the most relevant keywords for our literature search, we performed a preliminary search on Google Scholar with the terms “entrepreneurial ecosystem” and “sustainability.” We analyzed the initial 50 searches to update our list of keywords. Then, we performed a similar search in the following journals: *Sustainability*, *Small Business Economics*, and *Business Strategy and the Environment*. The search revealed these keywords: green entrepreneurship, sustainable entrepreneurship, sustainable start-ups and new ventures, sustainable entrepreneurs, and ecosystem. Following prior SLRs (e.g., Kaur et al., 2020; Khan et al., 2021; Maroufkhani et al., 2018), we employed Scopus and Web of Science (WOS) as digital databases

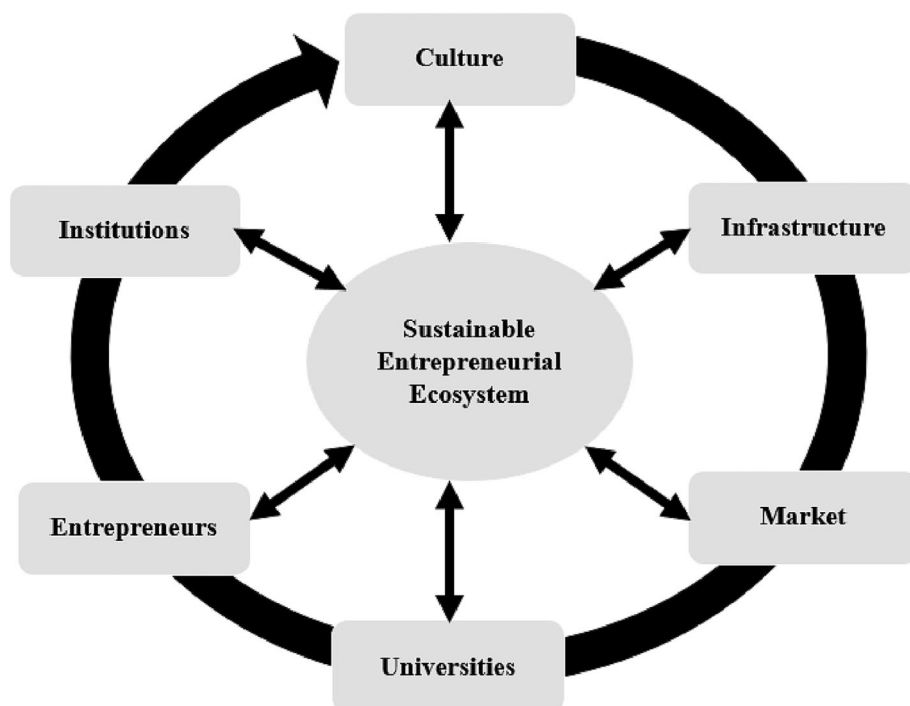


FIGURE 1 Overview of a sustainable entrepreneurial ecosystem.

to search and select relevant studies as per pre-specified inclusion and exclusion criteria (see Figure 2).

We performed our search using the keyword combinations of “green*” OR “sustain*” OR “ecology*” OR “environment” AND “start-up*” OR “startup*” OR “New ventures*” OR “entrep*” AND “ecosys*” published before February 7, 2022. The initial search yielded 778 studies from Scopus and 735 studies from WOS, respectively. Next, we eliminated duplicate studies and applied our inclusion/exclusion criteria to filter studies lacking congruence with our topic. To remain consistent with existing SLR studies, we focused only on peer-reviewed articles published in English (Christofi et al., 2017; Khan et al., 2021). Therefore, we excluded editorials, conference proceedings, book chapters, and book reviews (Vrontis & Christofi, 2021).

We screened the contents of the selected studies to ensure that they were related to entrepreneurial ecosystems and sustainability (Dhir et al., 2020). We excluded studies by scanning for keywords in the title, abstract, and introduction section of each article. In the next step, we carefully read all the selected articles. This step helped us identify 69 studies that matched our selection

criteria. Finally, we applied a citation chaining search to check whether any relevant studies were not included but should have been considered. The citation-chaining process allowed eight more congruent studies to be identified, resulting in a final tally of 77 studies for review. Figure 2 illustrates the entire process of the search.

3.1 | Research profiling

The summary statistics presented below include the number of year-wise publications, the geographic context of the studies, and the methodology. Figure 3 suggests that the number of articles published on entrepreneurial ecosystems and sustainability has increased since 2011.

Sustainability, Small Business Economics, Business Strategy and the Environment, the Journal of Cleaner Production, Management of Environmental Quality: An International Journal, and the Journal of Hospitality and Tourism Management are the outlets with the most published studies examining entrepreneurial ecosystems and sustainability.

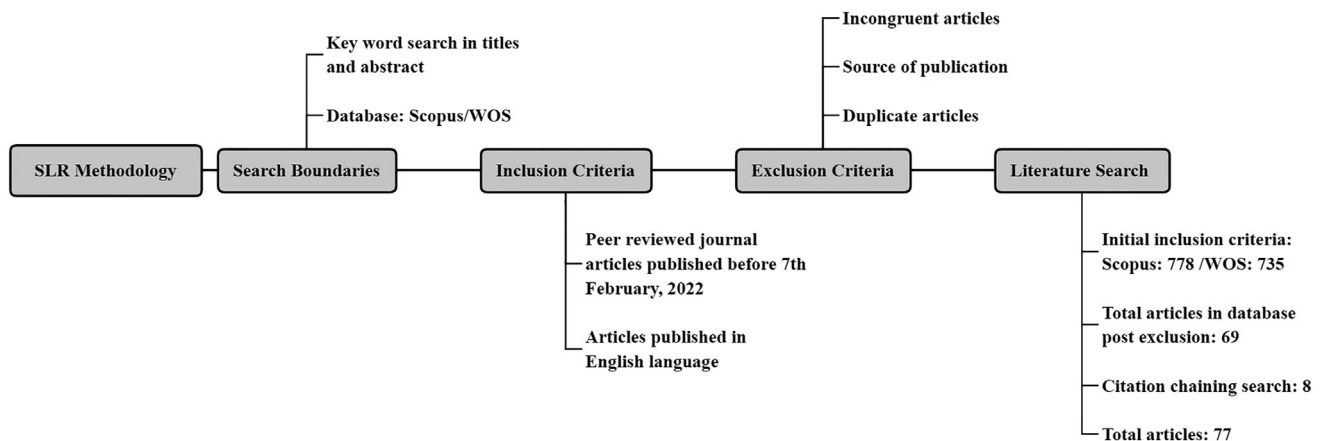


FIGURE 2 Search criteria.

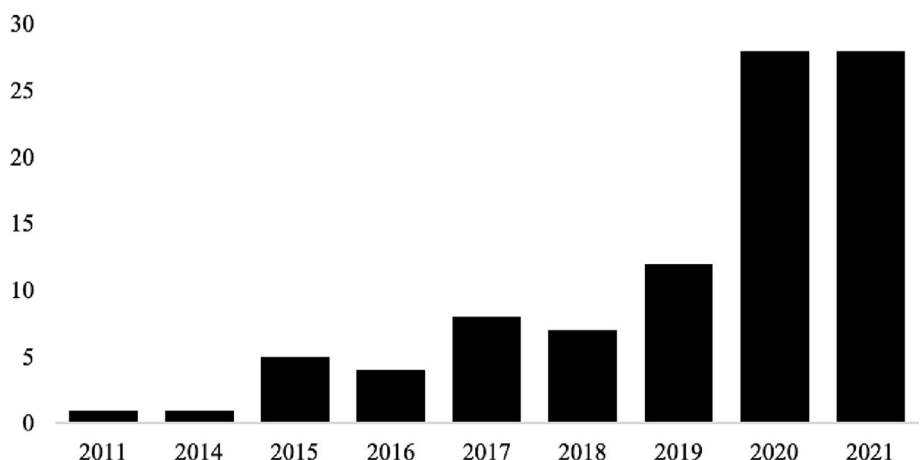


FIGURE 3 Number of publications per year.

Figure 4 depicts peer-reviewed journal outlets with more than two publications.

Figure 5 exhibits the geographical scope of the studies, with Europe, Asia, and North America contributing the most studies from our sample. We noted that sparse research has been done in the context of Africa and South America. We found no research in the context of Australia.

Regarding methodology, we found qualitative research designs to be dominant (64%), followed by quantitative designs (35%). We also observed sparse research adopting mixed methods (1%; see Figure 6).

4 | FINDINGS OF THEMATIC ANALYSIS

The pool of selected studies ($n = 77$) for this review was rigorously reviewed, and thematic analysis was undertaken to better understand the diverse thematic aspects of entrepreneurial ecosystems and sustainability. Our understanding of the selected studies was formed by identifying the aim, research objectives, hypothesis, results, and implications for each article (Mochkabadi & Volkmann, 2020). We read each paper in detail and extracted information, including key concepts, methodology, key findings, implied theories, the geographical context, existing gaps, and future research avenues. Finally, we

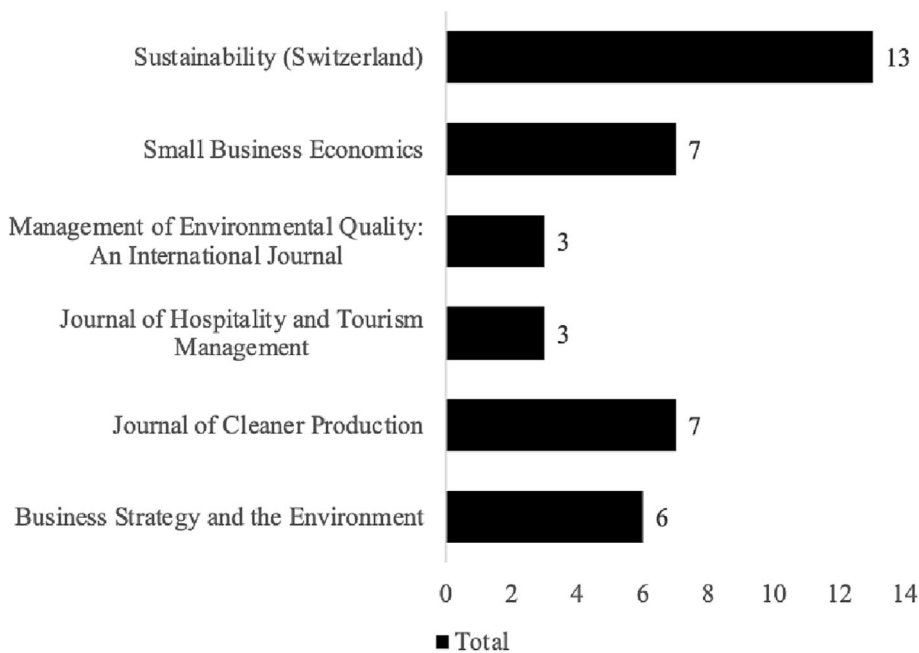


FIGURE 4 Prominent publication outlets.

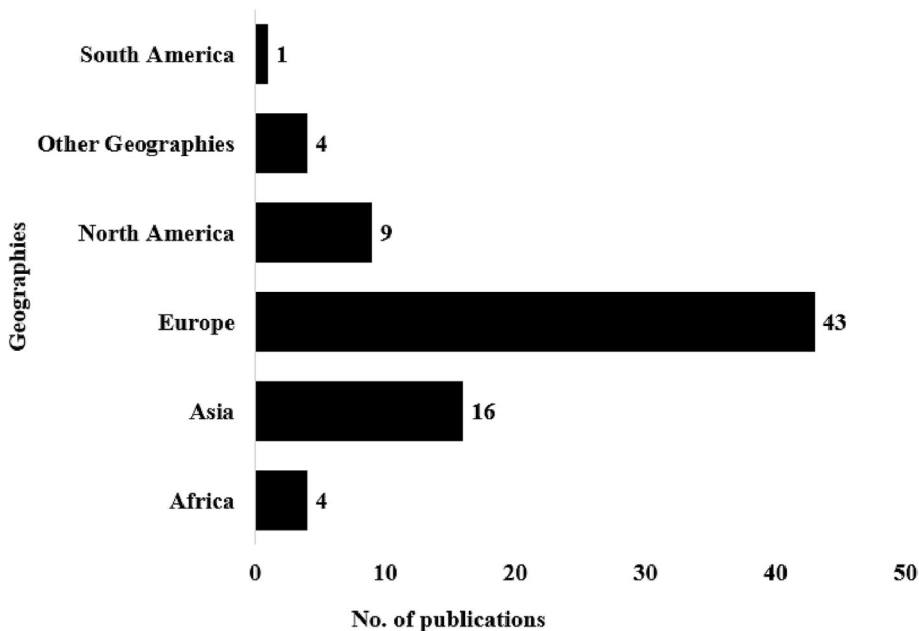


FIGURE 5 The geographic scope of studies.

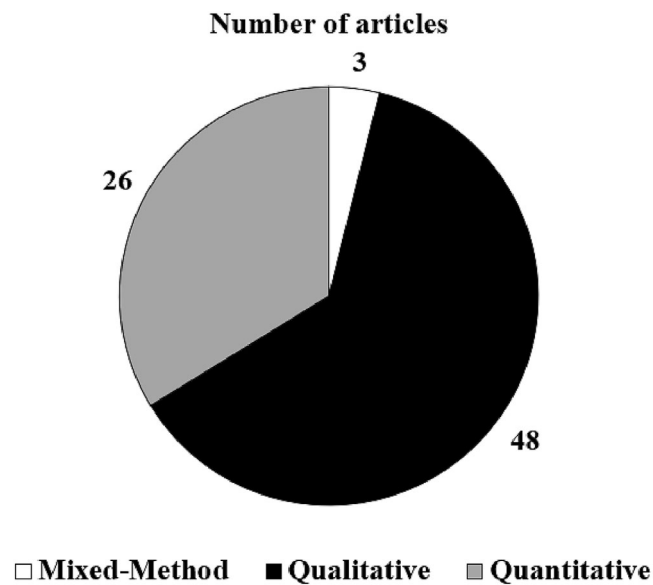


FIGURE 6 Methodology applied.

evaluated individual studies to uncover common themes and to synthesize the findings systematically.

In brief, we followed a three-step approach to provide an unbiased analysis of the reviewed literature. We undertook open coding employing Microsoft Excel, followed by axial coding to identify relationships among the open codes. This resulted in four major research themes. Figure 7 depicts these key themes.

4.1 | How do entrepreneurial ecosystems become more sustainable?

Our review of the prior literature suggested that macro-level factors, such as supportive culture (Bischoff, 2021; Tipu, 2021), gender (Tiba et al., 2021), engagement between actors (O'Shea et al., 2021), governance and public policy (Takyi & Naidoo, 2020), and access to new markets (Bărbulescu et al., 2021; Costa & Matias, 2020) enable the sustenance and success of sustainable entrepreneurial ecosystems.

Bischoff (2021) highlighted the importance of supportive entrepreneurial culture and stakeholders' support for creating sustainable entrepreneurial ecosystems. The finding reveals that macro-environment and stakeholder engagement is crucial for a sustainable ecosystem. Van Rijnsoever (2022) posited the role of *entrepreneurial support organizations* as a driver of sustainable entrepreneurial ecosystems. The authors argued that entrepreneurial support organizations act as financial support networks and network brokers between venture capitalists and sustainability-oriented startups. Tiba et al. (2020) discussed how the interactions between culture, networks, and actors (e.g., investors and mentors) reinforce sustainability-based outcomes within an ecosystem. The findings revealed the role of successful entrepreneurs in shaping the

entrepreneurial ecosystem. Tiba et al. (2021) pointed out that high per capita GDP and higher shares of female founders in an ecosystem induce sustainable entrepreneurial ecosystems. O'Shea et al. (2021) posited that the collective engagement of actors in new venture ideation enables the development of the entrepreneurial ecosystem. Specifically, more trustful and cooperative relationships between actors facilitate proactive sustainable behavior in the ecosystem. Pankov, Velamuri, and Schneckenberg (2021) identified contextual attributes enabling an entrepreneurial ecosystem, including customers, investors, government, and the local community. The authors theorized that commitment to sustainability values, integrating various stakeholders, leveraging strategic resources, and the deployment of information technology are key drivers of a sustainable entrepreneurial ecosystem. Pizzi et al. (2022) explored how digitalization can facilitate the transition of small firms toward sustainable entrepreneurship. In brief, supportive institutional mechanisms, public policies, and social factors are crucial for sustainability-based ventures (Bischoff, 2021; Sunny & Shu, 2019; Theodoraki et al., 2018). Supportive institutional mechanisms also shape the willingness of entrepreneurs to engage in risk-taking associated with sustainable entrepreneurship (Biru et al., 2021; Tiba et al., 2020). Interactions between networks based on trustful relationships allow access to resources and knowledge spillover (Raposo et al., 2021; Theodoraki et al., 2018).

Despite increased research, research gaps remain concerning the drivers of sustainable entrepreneurial ecosystems. First, it is unclear what factors successfully influence the transition of an entrepreneurial ecosystem into a sustainable ecosystem. Ambiguity remains regarding the barriers faced while achieving SDGs and what factors enable their achievement across cultures. How interactions across cultural, social, economic, and political contexts influence sustainable entrepreneurship also remains unclear, and we lack clarity on the boundary conditions for sustainable entrepreneurship, such as governance and leadership. Finally, the emergence of a sustainable ecosystem is a dynamic phenomenon (Moggi & Dameri, 2021); thus, how a sustainable ecosystem evolves and how a country's economic development level affects the entrepreneurial ecosystem's emergence remains an unaddressed research gap. In brief, we put forth the following potential research questions (PRQs): **PRQ1.** How does the interaction between firm-related internal factors and external factors influence the success of sustainability-based ventures in the ecosystem? Specifically, (a) how does the configuration of ecosystem elements result in sustainability; (b) how do interactions between actors at multiple levels influence the emergence of a sustainable entrepreneurial ecosystem; and (c) what motivates actors in the ecosystem to support sustainable entrepreneurship? **PRQ2.** How do resources flow in a sustainability-oriented ecosystem, and how do networks influence resource flow in the ecosystem? **PRQ3.** What role do policymakers play in the development of a sustainable ecosystem? How do government regulations and policies influence the emergence of a sustainable ecosystem? **PRQ4.** How do men and women influence sustainability-related outcomes differently?

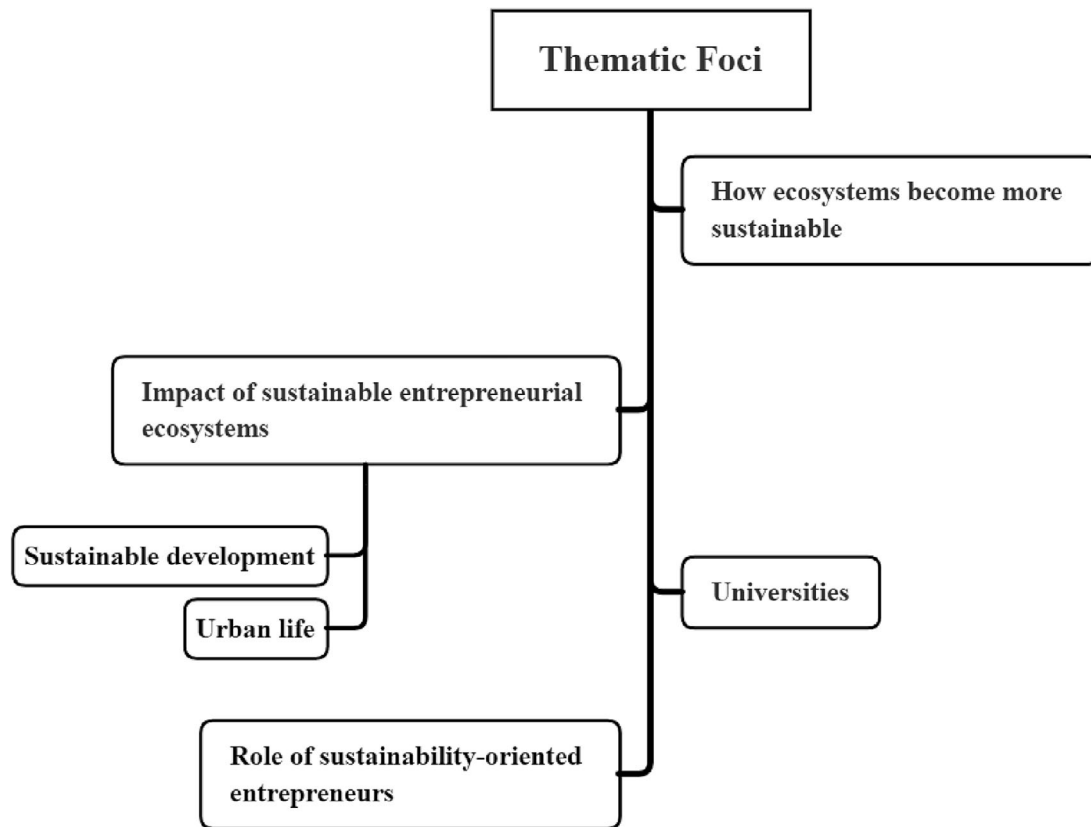


FIGURE 7 Key themes.

4.2 | Role of sustainability-oriented entrepreneurs

The pursuit of entrepreneurship depends on the entrepreneurs' perceptions of the ecosystem, their ambitions, lifestyle motivation, decision-making logic, willingness to resolve social problems, and network characteristics (Cunha et al., 2020; Grigore & Dragan, 2020). Scholars have noted the crucial role of micro-level practices (Pankov, Schneckenberg, & Velamuri, 2021; Raposo et al., 2021). There is an emerging agreement in the literature that entrepreneurs pursuing sustainable entrepreneurial opportunities are distinct from traditional entrepreneurs (DiVito & Ingen-Housz, 2021; Shepherd & Patzelt, 2011; Talwar et al., 2022). As individual actors, sustainability-oriented entrepreneurs initiate ventures to serve their self-interests (Hoogendoorn et al., 2019). They act as catalysts to achieve sustainability goals through social-economic transformation and their roles as role models, mentors, and investors (Parrish & Foxon, 2006; Pizzi et al., 2022). Moreover, they pursue sustainable opportunities that stimulate change by shaping customers' and investors' perceptions toward greener consumption and boosting environmental and socio-economic gains (Dhir et al., 2021; Haldar, 2021).

Tiba et al. (2020) showed how entrepreneurs play a crucial role in shaping an entrepreneurial ecosystem's cultural and social attributes and creating an environment where sustainable entrepreneurs can flourish. These entrepreneurs attract new talent and resources by playing the role of an accelerator. Pankov, Schneckenberg et al. (2021,

p. 6) theorized three micro-level practices: "building a supportive environment," "disrupting normative standards," and "reframing the sustainability paradigm" shaping the entrepreneurial ecosystem. Sustainability-oriented entrepreneurs build a supportive environment by building a network of sustainable ventures and local communities, sharing knowledge, and organizing campaigns. They confront existing business practices by provoking partners to realign existing practices and invest in sustainability-oriented activities (Dhir et al., 2023). Finally, entrepreneurs build partnerships and cooperate with other stakeholders to build sustainability-oriented projects. Vuorio et al. (2018) shed light on the decision-making logic and perceptions of entrepreneurial opportunities shaping sustainability-related outcomes of entrepreneurial ventures by observing that sustainable entrepreneurs are oriented toward both social responsibility and entrepreneurial exploration and exploitation. DiVito and Ingen-Housz (2021) posited that sustainable entrepreneurs undertook entrepreneurial experimentation to engage in highly uncertain markets with ambiguous innovation outcomes. The authors posited that sustainable entrepreneurs leverage the strengths of entrepreneurial ecosystems to explore and exploit new product opportunities. Similarly, Kim et al. (2021) argued that entrepreneurs' awareness of social problems, such as poverty and environmental issues, is crucial for the genesis of sustainability-based ventures (Bhatt et al., 2020). Entrepreneurs must reconcile conflicting logic while balancing entrepreneurial challenges (DiVito & Ingen-Housz, 2021). In brief, an entrepreneur's motivation,

willingness to resolve societal problems, and ability to manage paradoxes and mobilize resources lead to the genesis of sustainability-oriented business models (Cunha et al., 2020; Kim et al., 2021).

Despite an agreement on the crucial role of entrepreneurial actors as the drivers of sustainable ecosystems, a further research gap remains concerning the role of entrepreneurs in developing a sustainable entrepreneurial ecosystem. We lack clarity on how entrepreneurial motivation influences the genesis of sustainable ventures in a sustainable entrepreneurial ecosystem and how entrepreneurs recognize sustainable entrepreneurial opportunities. Furthermore, we lack clarity on how entrepreneurs transition toward sustainable entrepreneurship (Pankov, Velamuri, & Schneckenberg, 2021). Therefore, it is important to understand the evolution of sustainability-based opportunities. Specifically, we propose the following PRQs: **PRQ5**. How does entrepreneurial logic influence the sustainability-related outcomes of entrepreneurial ventures? **PRQ6**. How does the interaction between causal and effectual logic influence sustainability outcomes? How do demography and prior work experience influence the recognition of opportunities? **PRQ7**. How do entrepreneurs orchestrate resources while pursuing sustainable opportunities? **PRQ8**. How does the embeddedness of entrepreneurs influence sustainability-related outcomes? **PRQ9**. What role do successful sustainability-based start-ups play in building a sustainability-based ecosystem? **PRQ10**. What are the barriers to the adoption of circular entrepreneurship?

4.3 | Universities

Our literature review reveals that universities are not only education providers; they also play a crucial role in shaping sustainability-related outcomes (Fischer et al., 2021; Knudsen et al., 2021; Wagner et al., 2021). Universities are crucial for entrepreneurial knowledge generation, training manpower, opportunity recognition, and creating a supportive environment to facilitate entrepreneurship (Spigel & Harrison, 2008). Because the transition toward a sustainable ecosystem is knowledge-driven, research universities significantly impact the entrepreneurial ecosystem by collaborating with various actors (Cohen & Winn, 2007) and pursuing academic entrepreneurship (Bouncken & Kraus, 2022; Huang-Saad et al., 2017; Wagner et al., 2021).

Wagner et al. (2021) examined how university programs enable sustainable regional entrepreneurship. The authors theorized the role of universities in disseminating entrepreneurial knowledge and facilitating knowledge spillover. Fischer et al. (2021) highlighted how frugal innovations arise from university-industry relationships. The authors pointed out the crucial role of universities' internal proficiencies and their ability to connect with the surrounding ecosystem as the drivers of frugal innovations and the key to meeting the UN's sustainability goals. Researchers have also theorized a linkage between social networks and academic entrepreneurship (Hayter, 2016; Theodoraki et al., 2018). In particular, Theodoraki et al. (2018) examined how social capital dimensions are relevant to developing an entrepreneurial

ecosystem. The authors theorized that the structural dimension provides access to resources. The findings reveal that the cognitive dimension strengthens the relationships among actors, and the relational dimension allows the development of trustworthy relationships. Succinctly, we noted agreement in the literature on the premise that universities are now transforming themselves from traditional teaching and research institutions to having a broader societal role in addressing sustainability-related challenges (Hayter, 2016; Wagner et al., 2021).

However, a research gap remains as there is a need for a more robust understanding of university-based entrepreneurial ecosystems (Theodoraki et al., 2018). We lack clarity on how various dimensions of the university's social capital influence sustainability-related outcomes. Ambiguity remains regarding the effect of academic programs on sustainable ventures. There is a lack of clarity on how knowledge transfer happens in entrepreneurial universities. In addition, we noted that the extant research is predominantly qualitative, with a lack of generalizability across varied contexts. Specifically, we propose the following PRQs: **PRQ11**. What dimensions of universities' social capital influence a sustainability-oriented ecosystem? **PRQ12**. How does culture influence the working of universities-based entrepreneurial ecosystems? **PRQ13**. How do universities design academic programs which support the entrepreneurial ecosystem? How do universities manage knowledge-based capabilities to achieve sustainable goals? Does the ecosystem moderate the effectiveness of universities in achieving innovation goals?

4.4 | Outcomes of the sustainable entrepreneurial ecosystem

The sustainable entrepreneurial ecosystem provides a conducive environment to ensure sustainable development by harmonizing the goals of all stakeholders (Tolstyk et al., 2021). Interaction between actors stimulates knowledge transfer in the region and contributes to sustainable development at the micro and macro levels and the efficient usage of resources (Khatami et al., 2021). In addition to enabling knowledge transfer and, in turn, the efficient use of resources (e.g., raw materials, waste, energy, and water) that generate economic gains, a sustainable entrepreneurial ecosystem creates entrepreneurial opportunities, stimulates innovation, and supports environmental protection (Laveren et al., 2020). There is agreement in the literature that traditional measures of an entrepreneurial ecosystem performance, for example, knowledge transfer, innovation, and new venture creation, may not capture the sustainability dimension of the entrepreneurial ecosystem (Cohen & Winn, 2007; Costa & Matias, 2020; Tiba et al., 2021). Our literature review further reveals that metrics such as urban development (Henne et al., 2020; Simatupang et al., 2015; Thees et al., 2020) and sustainability outcomes at the firm and national levels (Carayannis et al., 2021; Kanda et al., 2021; Raposo et al., 2021) might complement economic indicators of entrepreneurial ecosystem performance.

4.4.1 | Sustainable development

Cohen and Winn (2007) pointed out the role of eco-parks in waste elimination and achieving sustainability outcomes. The sustainable entrepreneurial ecosystem enables firms to recognize opportunities to reverse environmental degradation and achieve social, economic, and ecological benefits. Kanda et al. (2021) posited the crucial role of the ecosystem in implementing circular business models. The adoption of a circular business model calls for intensive interaction between various actors in the ecosystem. Likewise, Raposo et al. (2021) noted that cooperation between suppliers, customers, universities, government, and research institutes positively impacts national sustainability. The findings revealed that entrepreneurial attitude and abilities are crucial drivers of sustainability outcomes. Pizzi et al. (2022) theorized that digital platforms are vital in enabling small firms to adopt sustainability practices. The findings further revealed that digital platforms allow business model configuration and engagement with stakeholders. Zhao et al. (2021) explored how the entrepreneurial ecosystem enables inclusive entrepreneurship by supporting bottom-of-the-pyramid entrepreneurs. The findings revealed that digital technologies are crucial in empowering bottom-of-the-pyramid entrepreneurs by providing access to resources, building new networks, and achieving sustainability-based outcomes (Autio et al., 2018).

Notably, despite a growing body of research, a research gap exists concerning entrepreneurial firms' motivation toward sustainability. There is a lack of clarity on how sustainable opportunities are created. The cross-level interaction implies the potential synergistic effects of the sustainable ecosystem at multiple levels. However, the research on sustainable entrepreneurial ecosystems has primarily focused on analysis at a single level (Simatupang et al., 2015). Therefore, a knowledge gap exists regarding how the interaction of actors results in the emergence and growth of a sustainable ecosystem (Kang et al., 2021). It is important to understand why some ecosystems have a high percentage of sustainable outputs while others lack them (Tiba et al., 2021). We propose the following PRQs. **PRQ14.** Why do not more ecosystems have a significant share of sustainable ventures? Why are few ecosystems able to influence the resilience of economies? **PRQ15.** How are sustainable opportunities in the entrepreneurial ecosystem discovered? **PRQ16.** How does a sustainable entrepreneurial ecosystem shape the behavior of entrepreneurs?

4.4.2 | Urban life

Academic discussions regarding the development of sustainable cities and their links to local and regional governance have recently gained prominence (Audretsch & Belitski, 2017; Eichelberger et al., 2020; Kang et al., 2021). Our literature review further highlights the linkage between information technology, artificial intelligence, machine learning, and urban development, particularly within smart cities (Ciasullo et al., 2020; Hajikhani, 2020). The emergence of the smart city and the Internet of Things is also theorized to be a response to environmental challenges and to ensure that economic

development is synergized with protecting the environment and improving the quality of life for residents (Eichelberger et al., 2020). The smart cities concept focuses on using technology, citizens, and institutional logic to foster urban sustainability. Likewise, the Internet of Things provides the potential to connect billions of devices resulting in smart houses, intelligent transportation systems, and smart cities, making living easier (Pasolini et al., 2018). The interaction between actors, such as cultural organizations, industry, and retailers, can promote a sustainable management model of urban centers (Henche et al., 2020).

Nonetheless, the research dealing with communities and urban/rural contexts calls for further investigations. Concerning cultural factors, we note some limitations as most of the studies focus on Europe. This indicates the need to contextualize more investigations in emerging market countries. Specifically, future research needs to explore the following PRQs: **PRQ17.** How can sustainable activities within smart cities be measured? What are the potential measures of a sustainable entrepreneurial ecosystem's success? **PRQ18.** How is innovation manifested in a sustainable ecosystem?

5 | CONCEPTUAL FRAMEWORK

Our conceptual framework, the *Sustainable Entrepreneurial Ecosystem Framework*, is based on our thematic discussion and uncovers how and why interactions between actors are crucial for the genesis of sustainable entrepreneurial ecosystems. The three components of our framework are (1) the antecedents of a sustainable entrepreneurial ecosystem elucidating its genesis, (2) productive entrepreneurship as an output of the ecosystem, and (3) outcomes of a sustainable entrepreneurial ecosystem at the territorial level (see Figure 8).

We theorize the pivotal role of various entrepreneurial actors, focusing on sustainability-related outcomes (Pacheco et al., 2010; Wagner et al., 2021). As entrepreneurs' motivation and decision-making logic have not received adequate attention in the extant literature (Cunha et al., 2020), we propose an exploration of entrepreneurs' motivation while engaging in sustainable ventures (Vuorio et al., 2018). The awareness of entrepreneurs regarding sustainability problems and their willingness to solve them leads to the formation of sustainability-oriented business models (Kim et al., 2021). We further argue that entrepreneurs rely upon social networks, communities, and macro-level factors such as collaborative culture (Bischoff & Volkmann, 2018) while designing benign solutions for resolving societal challenges (Neumeyer & Santos, 2018).

Further, the role of universities is crucial in facilitating knowledge transfer within the sustainable entrepreneurial ecosystem (Bischoff & Volkmann, 2018; Wagner et al., 2021). Specifically, the collaboration of universities with various stakeholders like science and technology parks, government organizations, alumni, accelerators, and incubators is crucial for the genesis of a sustainable entrepreneurial ecosystem. Additionally, we theorize that the systemic approach allows consideration of the interactions between actors and contextual factors (Neumeyer & Santos, 2018). The configuration of the ecosystem's

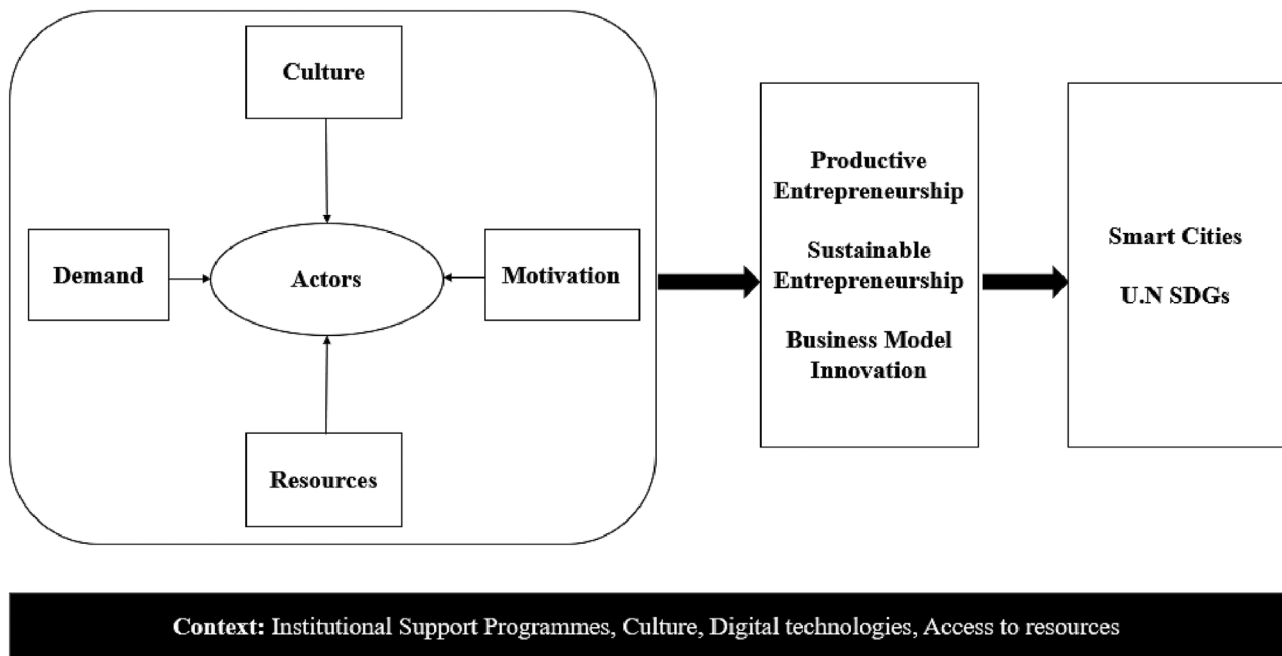


FIGURE 8 Sustainable entrepreneurial ecosystem framework.

elements results in sustainability outcomes as the development of an entrepreneurial ecosystem requires both a top-down approach of policymakers as well as bottom-up initiatives of entrepreneurial actors (Gifford et al., 2021). The interactions within the ecosystem provide sustainability-oriented entrepreneurs with the necessary resources to achieve their goals.

We posit that contextual factors, such as institutional factors (Doblinger et al., 2019; Martínez-Fierro et al., 2020; Pacheco et al., 2010), and inter-firm mechanisms such as trust (Muldoon et al., 2018), the adoption of digital technologies (Pizzi et al., 2022), and the strength of connections (Kanda et al., 2021; Theodoraki et al., 2018;) positively shape outcomes beyond productive entrepreneurship through the development of organizational capabilities. In contrast, low human capital, negative spillovers, uncertainty in government regulation, and high transaction costs negatively shape the development of a sustainability-oriented ecosystem (Cao & Zhang, 2021; Sunny & Shu, 2019). Specifically, we propose that entrepreneurial support programs shape entrepreneurial behavior and, in turn, productive entrepreneurship (Biru et al., 2021). The effective collaboration of universities with entrepreneurial actors facilitates knowledge spillover (Wagner et al., 2021) and frugal innovation (Fischer et al., 2021). Digital platforms play a crucial role in the development of a sustainable entrepreneurial ecosystem as they facilitate interaction between actors (Calabrese et al., 2021). Further, the interactions between actors facilitated by digital platforms shape resource exchanges and the development of sustainability-oriented business models (Carayannis et al., 2018; Neumeyer & Santos, 2018; Pizzi et al., 2022).

Finally, we posit that business model innovation is crucial for a successful transition toward sustainability goals (Henry et al., 2020). The sustainable entrepreneurial ecosystem yields potential performance

outcomes, such as the development of sustainability-oriented start-ups in a region (Tiba et al., 2020, 2021), sustainable innovation (Khatami et al., 2021), business model innovation (Calabrese et al., 2021; Hellström et al., 2015), new eco-innovation patents, and circular entrepreneurship (Carayannis et al., 2021; Kanda et al., 2021; Neumeyer & Santos, 2018). The potential outcomes include improved quality of life through urban development (Simatupang et al., 2015), a reduction in greenhouse gas emissions (Zhao et al., 2020), and the emergence of sustainable opportunities (Bărbulescu et al., 2021).

6 | DISCUSSION

The purpose of this SLR was to explicate the linkages between entrepreneurial ecosystems and sustainability and answer three research questions: **RQ1.** What is new about sustainable entrepreneurial ecosystems? **RQ2.** What are the existing findings on the intersection of entrepreneurial ecosystems and sustainability? **RQ3.** How is sustainable ecosystem research different from traditional ecosystem research? First, we generated a research profile of the selected 77 studies. Next, we performed a content analysis to identify four key themes emerging from the selected studies: (1) how entrepreneurial ecosystems become more sustainable, (2) sustainability-oriented entrepreneurs and sustainable ecosystems, (3) universities and sustainable ecosystems, and (4) outcomes of a sustainable entrepreneurial ecosystem. The thematic analysis helped us identify a potential agenda for future research and propose a conceptual framework.

The thematic analysis revealed that a sustainable entrepreneurial ecosystem is different from an entrepreneurial ecosystem in the

following ways: Sustainable entrepreneurial ecosystems focus on resource efficiency and sustainable outcomes instead of merely focusing on productive entrepreneurship and economic gains (DiVito & Ingen-Housz, 2021; Dorado, 2006). The share of sustainability start-ups in the sustainable ecosystem is much higher than in the conventional entrepreneurial ecosystem (Cohen, 2006; Martínez-Fierro et al., 2020). The linkages between sustainability-oriented actors affect sustainable new value creation at territorial levels (Shvetsova & Lee, 2021).

Further, the genesis of a sustainable entrepreneurial ecosystem depends upon successful start-ups (Tiba et al., 2020), the presence of entrepreneurial actors (Bank et al., 2017), culture (Bischoff, 2021), governance (Takyi & Naidoo, 2020), market access (Bărbulescu et al., 2021), digitalization (Pizzi et al., 2022), and the presence of sustainability-oriented actors (Cunha et al., 2020). Successful start-ups are crucial in developing a sustainable entrepreneurial ecosystem (Tiba et al., 2020). Sustainable entrepreneurship within a region depends on the entrepreneurs' ambitions, understanding of social problems, and decision-making logic (Grigore & Dragan, 2020; Raposo et al., 2021). Sustainability-oriented entrepreneurs initiate social-economic transformations by acting as role models and shaping the perception of various actors in the ecosystem (Dhir et al., 2021; Haldar, 2021; Pizzi et al., 2022).

Furthermore, the thematic analysis revealed that the supportive macro environment in the form of supportive culture and the presence of entrepreneurial support organizations acting as network brokers facilitate the engagement of entrepreneurial actors (O'Shea et al., 2021; Tiba et al., 2020; van Rijnsoever, 2022). Sustainability-oriented entrepreneurs attract new talent within an ecosystem by playing the role of accelerator, confronting existing business practices, and building local communities to facilitate knowledge sharing (Tiba et al., 2020). They undertake experimentation in highly uncertain markets by reconciling conflicting logic while balancing social and economic goals (Cunha et al., 2020; DiVito & Ingen-Housz, 2021; Kim et al., 2021).

The findings also revealed the crucial role of universities in the sustainable entrepreneurial ecosystem (Wagner et al., 2021). Universities facilitate entrepreneurial knowledge generation and provide a supportive environment through educational programs and developing partnerships with various actors (Cohen & Winn, 2007; Spigel & Harrison, 2008; Wagner et al., 2021). For example, universities shape awareness about new opportunities (Torres Valdés et al., 2019), provide access to resources (Theodoraki et al., 2018), and enable knowledge spillover (Wagner et al., 2021) and eco-innovation (Schaltegger & Wagner, 2011).

Finally, the thematic analysis revealed sustainable development of a region as the overall outcome of a sustainable entrepreneurial ecosystem through business model reconfiguration (Pizzi et al., 2022), supporting bottom-of-the-pyramid entrepreneurs (Zhao et al., 2021) and sustainable urban life (Eichelberger et al., 2020; Henche et al., 2020; Pasolini et al., 2018). The sustainable entrepreneurial ecosystem supports new ventures focusing on eco-innovation within regions (Theodoraki et al., 2022) and facilitates collaboration between various stakeholders within a community.

6.1 | Theoretical implications

Our study proffers the following major contributions as stated below.

First, our study builds upon emerging conversations linking entrepreneurial ecosystems and sustainability. Whereas entrepreneurial ecosystems focused on sustainability embrace the UN's sustainability goals and sustainable entrepreneurship in addition to the economic dimensions of entrepreneurship, a sustainable entrepreneurial ecosystem is unique, with a focus on economic, social, and ecological sustainability outcomes. Specifically, it is theorized as an interaction between actors centered on providing sustainability-focused support to foster entrepreneurial activities that simultaneously address the transformation to a sustainable regional economy (Bischoff & Volkmann, 2018; Raposo et al., 2021).

Second, despite the emerging research on entrepreneurial ecosystems, few studies provide a comprehensive overview of the relationship between ecosystems and sustainability. We attempt to fill this gap and summarize existing evidence on the causal mechanisms and clarify what influences the sustenance of the entrepreneurial ecosystem. The review shows that interactions between actors and cultures with a high awareness of sustainability are desired when developing a sustainable entrepreneurial ecosystem. Balancing conflicting social, environmental, and financial outcomes inherent in pursuing sustainable entrepreneurship requires all relevant actors in the ecosystem, including government, firms, entrepreneurs, and consumers.

Third, the review reveals that sustainable entrepreneurship is a systemic phenomenon involving interactions between various actors in the ecosystem (Raposo et al., 2021). Beyond entrepreneurs, entrepreneurial support organizations are crucial in supporting financially constrained sustainability-oriented start-ups (van Rijnsoever, 2022). Likewise, academic institutions play a crucial role in facilitating knowledge spillover (Theodoraki et al., 2018).

Finally, this literature review assisted in conceptualizing the framework of sustainable entrepreneurial ecosystems by revealing the genesis and outcomes of sustainable entrepreneurship. The conceptual framework differs from prior conceptualizations of the entrepreneurial ecosystem by focusing on the need for sustainable activities and support mechanisms that foster engagement in sustainable entrepreneurship. We outline how a sustainable ecosystem could be developed and leveraged to promote sustainable entrepreneurship (Bischoff, 2021). We also summarize the antecedents and the consequences of the sustainable entrepreneurial ecosystem, and we delineate the contextual factors influencing the relationship.

6.2 | Practical implications

Sustainable entrepreneurship is now acknowledged as an answer to environmental, economic, and social challenges involving stakeholders making high-stake decisions (Laveren et al., 2020). Policymakers are keen to develop sustainable entrepreneurial ecosystems globally (Tiba et al., 2021). Our study has the following major practical implications for entrepreneurs and policymakers.

First, businesses need to embrace sustainable solutions as part of their agenda (Hall et al., 2010), focusing on environmental management and the triple bottom line (Barkemeyer et al., 2014; Cohen, 2006). Entrepreneurs must develop and apply business models that are valuable to society (Raposo et al., 2021). They must take a proactive stance while fostering relationships with the actors in the ecosystem (Raposo et al., 2021). However, sustainability-oriented entrepreneurs often face hurdles due to a lack of resources and information asymmetries in a particular context (Haldar, 2021). Therefore, they need to play a paradoxical role in creating sustainable ventures (Shepherd & Patzelt, 2011; Stam, 2015).

Second, focus on sustainability outcomes is a priority for policymakers as they attempt to discourage entrepreneurial firms from embarking on ventures with high ecological costs (Tiba et al., 2021). Policymakers must create innovative environments by facilitating knowledge spillovers, providing a framework for shared risks in R&D, and enabling digital platforms connecting various actors (Costa & Matias, 2020).

Third, policymakers should design incentives that support and stimulate sustainability goals (Pizzi et al., 2022). They must shape a financial support network that allows sustainable entrepreneurs to connect with funding agencies (van Rijnsoever, 2022). Entrepreneurial support organizations must provide sustainability-oriented start-ups access to resources by connecting them with venture capitalists. The support policies for forming and leveraging sustainability-based business models need to be continuously strengthened, for example, by supporting entrepreneurs in drawing up ideas to solve environmental problems and facilitating funding (Kim et al., 2021).

Fourth, identifying other relevant actors in entrepreneurial ecosystems may assist policymakers in gathering the required resources for sustainable entrepreneurial activities. In particular, policymakers should leverage the role of universities (Hayter, 2016) and digital platforms (Pizzi et al., 2022) in sustaining entrepreneurial ecosystems. Policymakers may also encourage sustainability-oriented women entrepreneurs, support female founders, and support the creation of incubators focused on ventures backing women entrepreneurs to increase sustainability-focus endeavors and improve gender parity (Tiba et al., 2021). These initiatives may help increase sustainability-focused endeavors and improve women's participation. In doing so, policymakers can play a crucial role in shaping the perceptions of various actors, such as investors and consumers, toward sustainability-oriented technologies, products, and services (Haldar, 2021).

Finally, the proposed conceptual framework provides practical insights for sustainable entrepreneurs. Entrepreneurs need to initiate collaborative action and mobilize the advantages of their sustainability orientation. The theorized role of the entrepreneurial ecosystem in achieving the sustainable development of a region can provide the means to develop operational guidelines aimed at achieving the UN's SDGs (Tolstykth et al., 2021).

6.3 | Limitations and conclusion

We synthesized the existing research evidence on entrepreneurial ecosystems and sustainability to find research gaps and agendas for

future studies. We noted that the topic is germane to current academia and practice literature to handle future challenges. In this regard, our literature review reveals various enablers of sustainable entrepreneurship. We noted that the entrepreneurial ecosystem is crucial in connecting various actors and accessing resources. A sustainable entrepreneurial ecosystem provides ample opportunities for sustainability-oriented entrepreneurs. We noted that sustainable entrepreneurship depends upon actors' sustainability orientation and their ability to manage paradoxes and recognize sustainable opportunities by leveraging their interactions with other actors. By identifying other relevant actors and their roles in achieving sustainability-related goals, we take a step forward in advancing scientific knowledge regarding the entrepreneurial ecosystem and the genesis of environmentally-friendly entrepreneurial ventures.

Nonetheless, our study has significant limitations. First, literature reviews, conceptual papers, conference proceedings, editorials, book chapters, unpublished articles, and non-English language articles were excluded from consideration. The above exclusions resulted in the loss of valuable information for this review. Second, the scope of our review is limited to exploring the enablers, barriers, and outcomes of the systematic review. However, other drivers of the successful implementation of sustainable entrepreneurial ecosystems are crucial and need to be understood from different theoretical lenses (Bischoff & Volkmann, 2018). Accordingly, we recommend that future researchers expand our work to enrich the literature further. Moreover, a research gap exists concerning the crucial role of the entrepreneur in the genesis of a sustainable ecosystem (Tiba et al., 2020). There is a lack of clarity on how entrepreneurial logic influences sustainable entrepreneurship. Finally, we noted that the extant research on the sustainable ecosystem is underdeveloped in three ways. The concept of a sustainable entrepreneurial ecosystem has remained under-theorized, and disagreements remain regarding the genesis and outcomes of the sustainable ecosystem (Bischoff, 2021). A further research gap remains concerning methodical implications and reveals multilevel and longitudinal research opportunities to capture the outcomes of a sustainable entrepreneurial ecosystem.

AUTHORS' CONTRIBUTION

SC, PK, and HA: Conceptualization, formal analysis, methodology, validation, writing—original draft preparation, and writing—review & editing. JH and AD: Methodology, validation, writing—original draft preparation and writing—review & editing.

ACKNOWLEDGMENTS

The authors extend their appreciation to the Deanship of Scientific Research at Princess Nourah bint Abdulrahman University for funding this work through the Visiting Scholar Program.

CONFLICT OF INTEREST STATEMENT

The authors do not have any competing interests to declare.

ORCID

Sanjay Chaudhary  <https://orcid.org/0000-0001-9082-2160>

Amandeep Dhir  <https://orcid.org/0000-0002-6006-6058>

REFERENCES

- Ács, Z. J., Autio, E., & Szerb, L. (2014). National systems of entrepreneurship: Measurement issues and policy implications. *Research Policy*, 43(3), 476–494. <https://doi.org/10.1016/j.respol.2013.08.016>
- Acs, Z. J., Stam, E., Audretsch, D. B., & O'Connor, A. (2017). The lineages of the entrepreneurial ecosystem approach. *Small Business Economics*, 49(1), 1–10. <https://doi.org/10.1007/s11187-017-9864-8>
- Adner, R. (2017). Ecosystem as structure: An actionable construct for strategy. *Journal of Management*, 43(1), 39–58. <https://doi.org/10.1177/0149206316678451>
- Alvedalen, J., & Boschma, R. (2017). A critical review of entrepreneurial ecosystems research: Towards a future research agenda. *European Planning Studies*, 25(6), 887–903. <https://doi.org/10.1080/09654313.2017.1299694>
- Audretsch, D. B., & Belitski, M. (2017). Entrepreneurial ecosystems in cities: Establishing the framework conditions. *Journal of Technology Transfer*, 42(5), 1030–1051. <https://doi.org/10.1007/s10961-016-9473-8>
- Audretsch, D. B., Cunningham, J. A., Kuratko, D. F., Lehmann, E. E., & Menter, M. (2019). Entrepreneurial ecosystems: Economic, technological, and societal impacts. *Journal of Technology Transfer*, 44(2), 313–325. <https://doi.org/10.1007/s10961-018-9690-4>
- Autio, E., Nambisan, S., Thomas, L. D. W., & Wright, M. (2018). Digital affordances, spatial affordances, and the genesis of entrepreneurial ecosystems. *Strategic Entrepreneurship Journal*, 12(1), 72–95. <https://doi.org/10.1002/sej.1266>
- Awan, U., Sroufe, R., & Shahbaz, M. (2021). Industry 4.0 and the circular economy: A literature review and recommendations for future research. *Business Strategy and the Environment*, 30(4), 2038–2060. <https://doi.org/10.1002/bse.2731>
- Bacq, S., Drover, W., & Kim, P. H. (2021). Writing bold, broad, and rigorous review articles in entrepreneurship. *Journal of Business Venturing*, 36(6), 106147. <https://doi.org/10.1016/j.jbusvent.2021.106147>
- Bank, N., Fichter, K., & Klofsten, M. (2017). Sustainability-profiled incubators and securing the inflow of tenants—the case of green garage Berlin. *Journal of Cleaner Production*, 157, 76–83. <https://doi.org/10.1016/j.jclepro.2017.04.123>
- Bărbulescu, O., Tecău, A. S., Munteanu, D., & Constantin, C. P. (2021). Innovation of startups, the key to unlocking post-crisis sustainable growth in Romanian entrepreneurial ecosystem. *Sustainability (Switzerland)*, 13(2), 1–16. <https://doi.org/10.3390/su13020671>
- Barkemeyer, R., Holt, D., Preuss, L., & Tsang, S. (2014). What happened to the “development” in sustainable development? Business guidelines two decades after Brundtland. *Sustainable Development*, 22(1), 15–32. <https://doi.org/10.1002/sd.521>
- Behera, R. K., Bala, P. K., & Dhir, A. (2019). The emerging role of cognitive computing in healthcare: A systematic literature review. *International Journal of Medical Informatics*, 129(July), 154–166. <https://doi.org/10.1016/j.ijmedinf.2019.04.024>
- Belz, F. M., & Binder, J. K. (2017). Sustainable entrepreneurship: A convergent process model. *Business Strategy and the Environment*, 26(1), 1–17. <https://doi.org/10.1002/bse.1887>
- Bhatt, Y., Ghuman, K., & Dhir, A. (2020). Sustainable manufacturing. Bibliometrics and content analysis. *Journal of Cleaner Production*, 260, 120988. <https://doi.org/10.1016/j.jclepro.2020.120988>
- Biru, A., Gilbert, D., & Arenius, P. (2021). Unhelpful help: The state of support programmes and the dynamics of entrepreneurship ecosystems in Ethiopia. *Entrepreneurship and Regional Development*, 33(1–2), 108–130. <https://doi.org/10.1080/08985626.2020.1734267>
- Bischoff, K. (2021). A study on the perceived strength of sustainable entrepreneurial ecosystems on the dimensions of stakeholder theory and culture. *Small Business Economics*, 56(3), 1121–1140. <https://doi.org/10.1007/s11187-019-00257-3>
- Bischoff, K., & Volkmann, C. K. (2018). Stakeholder support for sustainable entrepreneurship - a framework of sustainable entrepreneurial ecosystems. *International Journal of Entrepreneurial Venturing*, 10(2), 172–201. <https://doi.org/10.1504/IJEV.2018.092714>
- Bouncken, R. B., & Kraus, S. (2022). Entrepreneurial ecosystems in an interconnected world: Emergence, governance and digitalization. *Review of Managerial Science*, 16(1), 1–14. <https://doi.org/10.1007/s11846-021-00444-1>
- Calabrese, M., La Sala, A., Fuller, R. P., & Laudando, A. (2021). Digital platform ecosystems for sustainable innovation: Toward a new meta-organizational model? *Administrative Sciences*, 11(4), 119. <https://doi.org/10.3390/admsci11040119>
- Calabrò, A., Vecchiarini, M., Gast, J., Campopiano, G., De Massis, A., & Kraus, S. (2019). Innovation in family firms: A systematic literature review and guidance for future research. *International Journal of Management Reviews*, 21(3), 317–355. <https://doi.org/10.1111/ijmr.12192>
- Cao, G. H., & Zhang, J. (2021). Is a sustainable loop of economy and entrepreneurial ecosystem possible? A structural perspective. *Environment, Development and Sustainability*, 23, 7002–7040. <https://doi.org/10.1007/s10668-020-00902-y>
- Carayannis, E. G., Grigoroudis, E., Campbell, D. F. J., Meissner, D., & Stamati, D. (2018). The ecosystem as helix: An exploratory theory-building study of regional co-opetitive entrepreneurial ecosystems as quadruple/quintuple helix innovation models. *R and D Management*, 48(1), 148–162. <https://doi.org/10.1111/radm.12300>
- Carayannis, E. G., Grigoroudis, E., Stamati, D., & Valvi, T. (2021). Social business model innovation: A quadruple/quintuple helix-based social innovation ecosystem. *IEEE Transactions on Engineering Management*, 68(1), 235–248. <https://doi.org/10.1109/TEM.2019.2914408>
- Cavallo, A., Ghezzi, A., & Balocco, R. (2019). Entrepreneurial ecosystem research: Present debates and future directions. *International Entrepreneurship and Management Journal*, 15(4), 1291–1321. <https://doi.org/10.1007/s11365-018-0526-3>
- Cho, D. S., Ryan, P., & Buciuni, G. (2021). Evolutionary entrepreneurial ecosystems: A research pathway. *Small Business Economics*, 58, 1865–1883. <https://doi.org/10.1007/s11187-021-00487-4>
- Christofi, M., Leonidou, E., & Vrontis, D. (2017). Marketing research on mergers and acquisitions: A systematic review and future directions. *International Marketing Review*, 34(5), 629–651. <https://doi.org/10.1108/IMR-03-2015-0100>
- Ciasullo, M. V., Troisi, O., Grimaldi, M., & Leone, D. (2020). Multilevel governance for sustainable innovation in smart communities: An ecosystems approach. *International Entrepreneurship and Management Journal*, 16(4), 1167–1195. <https://doi.org/10.1007/s11365-020-00641-6>
- Cohen, B. (2006). Sustainable valley entrepreneurial ecosystems. *Business Strategy and the Environment*, 15(1), 1–14. <https://doi.org/10.1002/bse.428>
- Cohen, B., & Winn, M. I. (2007). Market imperfections, opportunity and sustainable entrepreneurship. *Journal of Business Venturing*, 22(1), 29–49. <https://doi.org/10.1016/j.jbusvent.2004.12.001>
- Costa, J., & Matias, J. C. O. (2020). Open innovation 4.0 as an enhancer of sustainable innovation ecosystems. *Sustainability (Switzerland)*, 12(19), 1–19. <https://doi.org/10.3390/su12198112>
- Cunha, C., Kastenholz, E., & Carneiro, M. J. (2020). Entrepreneurs in rural tourism: Do lifestyle motivations contribute to management practices that enhance sustainable entrepreneurial ecosystems? *Journal of Hospitality and Tourism Management*, 44, 215–226. <https://doi.org/10.1016/j.jht.2020.06.007>
- Cunningham, J. A., Menter, M., & Wirsching, K. (2019). Entrepreneurial ecosystem governance: A principal investigator-centered governance framework. *Small Business Economics*, 52(2), 545–562. <https://doi.org/10.1007/s11187-017-9959-2>
- Delgado, M., Porter, M. E., & Stern, S. (2010). Clusters and entrepreneurship. *Journal of Economic Geography*, 10(4), 495–518. <https://doi.org/10.1093/jeg/lbq010>
- Dhir, A., Khan, S. J., Islam, N., Ractham, P., & Meenakshi, N. (2023). Drivers of sustainable business model innovations. An upper echelon theory

- perspective. *Technological Forecasting and Social Change*, 191, 122409. <https://doi.org/10.1016/j.techfore.2023.122409>
- Dhir, A., Talwar, S., Kaur, P., & Malibari, A. (2020). Food waste in hospital-ity and food services: A systematic literature review and framework development approach. *Journal of Cleaner Production*, 270, 122861. <https://doi.org/10.1016/j.jclepro.2020.122861>
- Dhir, A., Talwar, S., Sadiq, M., Sakashita, M., & Kaur, P. (2021). Green apparel buying behaviour: A stimulus–organism–behaviour–consequence (SOBC) perspective on sustainability-oriented consumption in Japan. *Business Strategy and the Environment*, 30(8), 3589–3605. <https://doi.org/10.1002/bse.2821>
- DiVito, L., & Ingen-Housz, Z. (2021). From individual sustainability orientations to collective sustainability innovation and sustainable entrepreneurial ecosystems. *Small Business Economics*, 56(3), 1057–1072. <https://doi.org/10.1007/s11187-019-00254-6>
- Dorado, S. (2006). Social entrepreneurial ventures: Different values so different process of creation, no? *Journal of Developmental Entrepreneurship*, 11(4), 319–343. <https://doi.org/10.1142/s1084946706000453>
- Eichelberger, S., Peters, M., Pikkemaat, B., & Chan, C. S. (2020). Entrepreneurial ecosystems in smart cities for tourism development: From stakeholder perceptions to regional tourism policy implications. *Journal of Hospitality and Tourism Management*, 45, 319–329. <https://doi.org/10.1016/j.jhtm.2020.06.011>
- Feldman, M. P., Francis, J., & Bercovitz, J. (2005). Creating a cluster while building a firm: Entrepreneurs and the formation of industrial clusters. *Regional Studies*, 39(1), 129–141. <https://doi.org/10.1080/0034340052000320888>
- Ferasso, M., Beliaeva, T., Kraus, S., Clauss, T., & Ribeiro-Soriano, D. (2020). Circular economy business models: The state of research and avenues ahead. *Business Strategy and the Environment*, 29(8), 3006–3024. <https://doi.org/10.1002/bse.2554>
- Fernandes, A. J., & Ferreira, J. J. (2022). Entrepreneurial ecosystems and networks: A literature review and research agenda. *Review of Managerial Science*, 16(1), 189–247. <https://doi.org/10.1007/s11846-020-00437-6>
- Filser, M., Kraus, S., Breier, M., Nenova, I., & Puumalainen, K. (2021). Business model innovation: Identifying foundations and trajectories. *Business Strategy and the Environment*, 30(2), 891–907. <https://doi.org/10.1002/bse.2660>
- Fischer, B., Guerrero, M., Guimón, J., & Schaeffer, P. R. (2021). Knowledge transfer for frugal innovation: Where do entrepreneurial universities stand? *Journal of Knowledge Management*, 25(2), 360–379. <https://doi.org/10.1108/JKM-01-2020-0040>
- Gifford, E., McKelvey, M., & Saemundsson, R. (2021). The evolution of knowledge-intensive innovation ecosystems: Co-evolving entrepreneurial activity and innovation policy in the West Swedish maritime system. *Industry and Innovation*, 28(5), 651–676.
- Grigore, A. M., & Dragan, I. M. (2020). Towards sustainable entrepreneurial ecosystems in a transitional economy: An analysis of two Romanian city-regions through the lens of entrepreneurs. *Sustainability (Switzerland)*, 12(15), 6061. <https://doi.org/10.3390/su12156061>
- Hajikhani, A. (2020). Impact of entrepreneurial ecosystem discussions in smart cities: Comprehensive assessment of social media data. *Smart Cities*, 3(1), 112–137. <https://doi.org/10.3390/smartcities3010007>
- Haldar, S. (2021). Sustainable entrepreneurship development in the renewable energy sector: Insights from Gujarat, India. *African Journal of Science, Technology, Innovation and Development*, 13(7), 873–885. <https://doi.org/10.1080/20421338.2020.1796004>
- Hall, J. K., Daneke, G. A., & Lenox, M. J. (2010). Sustainable development and entrepreneurship: Past contributions and future directions. *Journal of Business Venturing*, 25(5), 439–448. <https://doi.org/10.1016/j.jbusvent.2010.01.002>
- Hanlon, D., & Saunders, C. (2007). Marshaling resources to form small new ventures: Toward a more holistic understanding of entrepreneurial support. *Entrepreneurship Theory and Practice*, 31(4), 619–641. <https://doi.org/10.1111/j.1540-6520.2007.00191.x>
- Hayter, C. S. (2016). A trajectory of early-stage spinoff success: The role of knowledge intermediaries within an entrepreneurial university ecosystem. *Small Business Economics*, 47(3), 633–656. <https://doi.org/10.1007/s11187-016-9756-3>
- Hellström, M., Tsvetkova, A., Gustafsson, M., & Wikström, K. (2015). Collaboration mechanisms for business models in distributed energy ecosystems. *Journal of Cleaner Production*, 102, 226–236. <https://doi.org/10.1016/j.jclepro.2015.04.128>
- Henche, B. G., Salvaj, E., & Cuesta-Valiño, P. (2020). A sustainable management model for cultural creative tourism ecosystems. *Sustainability (Switzerland)*, 12(22), 9554. <https://doi.org/10.3390/su12229554>
- Henry, M., Bauwens, T., Hekkert, M., & Kirchherr, J. (2020). A typology of circular start-ups: An analysis of 128 circular business models. *Journal of Cleaner Production*, 245, 118528. <https://doi.org/10.1016/j.jclepro.2019.118528>
- Hoogendoorn, B., van der Zwan, P., & Thurik, R. (2019). Sustainable entrepreneurship: The role of perceived barriers and risk. *Journal of Business Ethics*, 157(4), 1133–1154. <https://doi.org/10.1007/s10551-017-3646-8>
- Huang-Saad, A., Fay, J., & Sheridan, L. (2017). Closing the divide: Accelerating technology commercialization by catalyzing the university entrepreneurial ecosystem with I-corps™. *Journal of Technology Transfer*, 42(6), 1466–1486. <https://doi.org/10.1007/s10961-016-9531-2>
- Johnson, M. P., & Schaltegger, S. (2020). Entrepreneurship for sustainable development: A review and multilevel causal mechanism framework. *Entrepreneurship: Theory and Practice*, 44(6), 1141–1173. <https://doi.org/10.1177/1042258719885368>
- Kanda, W., Geissdoerfer, M., & Hjelm, O. (2021). From circular business models to circular business ecosystems. *Business Strategy and the Environment*, 30(6), 2814–2829. <https://doi.org/10.1002/bse.2895>
- Kang, Q., Li, H., Cheng, Y., & Kraus, S. (2021). Entrepreneurial ecosystems: Analysing the status quo. *Knowledge Management Research & Practice*, 19(1), 8–20. <https://doi.org/10.1080/14778238.2019.1701964>
- Kansheba, J. M. P., & Wald, A. E. (2020). Entrepreneurial ecosystems: A systematic literature review and research agenda. *Journal of Small Business and Enterprise Development*, 27(6), 943–964. <https://doi.org/10.1108/JSBED-11-2019-0364>
- Kaur, P., Dhir, A., Talwar, S., & Alrasheedy, M. (2020). Systematic literature review of food waste in educational institutions: Setting the research agenda. *International Journal of Contemporary Hospitality Management*, 33(4), 1160–1193. <https://doi.org/10.1108/IJCHM-07-2020-0672>
- Khan, A., Krishnan, S., & Dhir, A. (2021). Electronic government and corruption: Systematic literature review, framework, and agenda for future research. *Technological Forecasting and Social Change*, 167, 120737. <https://doi.org/10.1016/j.techfore.2021.120737>
- Khatami, F., Scuotto, V., Krueger, N., & Cantino, V. (2021). The influence of the entrepreneurial ecosystem model on sustainable innovation from a macro-level lens. *International Entrepreneurship and Management Journal*, 1-33, 1419–1451. <https://doi.org/10.1007/s11365-021-00788-w>
- Kim, J., Lee, J., & Lee, T. J. (2021). The sustainable success and growth of social ventures: Their internal and external factors. *Sustainability (Switzerland)*, 13(9), 5005. <https://doi.org/10.3390/su13095005>
- Knudsen, M. P., Frederiksen, M. H., & Goduscheit, R. C. (2021). New forms of engagement in third mission activities: A multilevel university-centric approach. *Innovations*, 23(2), 209–240. <https://doi.org/10.1080/14479338.2019.1670666>
- Kraus, S., Mahto, R. V., & Walsh, S. T. (2021). The importance of literature reviews in small business and entrepreneurship research. *Journal of Small Business Management*, 61, 1–12. <https://doi.org/10.1080/00472778.2021.1955128>

- Kushwah, S., Dhir, A., Sagar, M., & Gupta, B. (2019). Determinants of organic food consumption. A systematic literature review on motives and barriers. *Appetite*, 143, 104402. <https://doi.org/10.1016/j.appet.2019.104402>
- Laveren, E., Blackburn, R., Ben-Hafaiedh, C., Díaz-García, C., & González-Moreno, Á. (2020). An introduction to sustainable entrepreneurship and entrepreneurial ecosystems. *Sustainable entrepreneurship and entrepreneurial Ecosystems*, January, 1–10. <https://doi.org/10.4337/9781839109690.00006>
- Liu, Z., & Stephens, V. (2019). Exploring innovation ecosystem from the perspective of sustainability: Towards a conceptual framework. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(3), 48. <https://doi.org/10.3390/joitmc5030048>
- Malecki, E. J. (2018). Entrepreneurship and entrepreneurial ecosystems. *Geography Compass*, 12(3), e12359. <https://doi.org/10.1111/gec3.12359>
- Maroufkhani, P., Wagner, R., & Wan Ismail, W. K. (2018). Entrepreneurial ecosystems: A systematic review. *Journal of Enterprising Communities*, 12(4), 545–564. <https://doi.org/10.1108/JEC-03-2017-0025>
- Martínez-Fierro, S., Biedma-Ferrer, J. M., & Ruiz-Navarro, J. (2020). Impact of high-growth start-ups on entrepreneurial environment based on the level of national economic development. *Business Strategy and the Environment*, 29(3), 1007–1020. <https://doi.org/10.1002/bse.2413>
- Mochkabadi, K., & Volkmann, C. K. (2020). Equity crowdfunding: A systematic review of the literature. *Small Business Economics*, 54(1), 75–118. <https://doi.org/10.1007/s11187-018-0081-x>
- Moggi, S., & Dameri, R. P. (2021). Circular business model evolution: Stakeholder matters for a self-sufficient ecosystem. *Business Strategy and the Environment*, 30(6), 2830–2842. <https://doi.org/10.1002/bse.2716>
- Moggi, S., Pierce, P., & Bernardi, N. (2021). From sustainability to thriving: A novel framework for entrepreneurial ecosystems. *International Entrepreneurship and Management Journal*, 18, 829–853. <https://doi.org/10.1007/s11365-021-00787-x>
- Moya-Clemente, I., Ribes-Giner, G., & Pantoja-Díaz, O. (2020). Configurations of sustainable development goals that promote sustainable entrepreneurship over time. *Sustainable Development*, 28(4), 572–584. <https://doi.org/10.1002/sd.2009>
- Muldoon, J., Bauman, A., & Lucy, C. (2018). Entrepreneurial ecosystem: Do you trust or distrust? *Journal of Enterprising Communities*, 12(2), 158–177. <https://doi.org/10.1108/JEC-07-2017-0050>
- Muñoz, P., & Cohen, B. (2018). Sustainable entrepreneurship research: Taking stock and looking ahead. *Business Strategy and the Environment*, 27(3), 300–322. <https://doi.org/10.1002/bse.2000>
- Neumeyer, X., & Santos, S. C. (2018). Sustainable business models, venture typologies, and entrepreneurial ecosystems: A social network perspective. *Journal of Cleaner Production*, 172, 4565–4579. <https://doi.org/10.1016/j.jclepro.2017.08.216>
- O'Shea, G., Farny, S., & Hakala, H. (2021). The buzz before business: A design science study of a sustainable entrepreneurial ecosystem. *Small Business Economics*, 56(3), 1097–1120. <https://doi.org/10.1007/s11187-019-00256-4>
- Pacheco, D. F., Dean, T. J., & Payne, D. S. (2010). Escaping the green prison: Entrepreneurship and the creation of opportunities for sustainable development. *Journal of Business Venturing*, 25(5), 464–480. <https://doi.org/10.1016/j.jbusvent.2009.07.006>
- Pankov, S., Schneckenberg, D., & Velamuri, V. K. (2021). Advocating sustainability in entrepreneurial ecosystems: Micro-level practices of sharing ventures. *Technological Forecasting and Social Change*, 166, 120654. <https://doi.org/10.1016/j.techfore.2021.120654>
- Pankov, S., Velamuri, V. K., & Schneckenberg, D. (2021). Towards sustainable entrepreneurial ecosystems: Examining the effect of contextual factors on sustainable entrepreneurial activities in the sharing economy. *Small Business Economics*, 56(3), 1073–1095. <https://doi.org/10.1007/s11187-019-00255-5>
- Parrish, B. D., & Foxon, T. J. (2006). Sustainability entrepreneurship and equitable transitions to a low-carbon economy. *Greener Management International*, 55, 47–62. <https://doi.org/10.9774/GLEAF.3062.2006.au.00006>
- Pasolini, G., Buratti, C., Feltrin, L., Zabini, F., de Castro, C., Verdone, R., & Andrisano, O. (2018). Smart city pilot projects using LoRa and IEEE802.15.4 technologies. *Sensors (Switzerland)*, 18(4), 1–17. <https://doi.org/10.3390/s18041118>
- Patzelt, H., & Shepherd, D. A. (2011). Recognizing opportunities for sustainable development. *Entrepreneurship: Theory and Practice*, 35(4), 631–652. <https://doi.org/10.1111/j.1540-6520.2010.00386.x>
- Pizzi, S., Leopizzi, R., & Caputo, A. (2022). The enablers in the relationship between entrepreneurial ecosystems and the circular economy: The case of circularity.com. *Management of Environmental Quality: an International Journal*, 33(1), 26–43. <https://doi.org/10.1108/MEQ-01-2021-0011>
- Qian, H., Acs, Z. J., & Stough, R. R. (2013). Regional systems of entrepreneurship: The nexus of human capital, knowledge and new firm formation. *Journal of Economic Geography*, 13(4), 559–587. <https://doi.org/10.1093/jeg/lbs009>
- Raposo, M., Fernandes, C. I., & Veiga, P. M. (2020). National systems of entrepreneurship: Goals of sustainability. *Journal of Entrepreneurship and Public Policy*, 9(4), 345–364. <https://doi.org/10.1108/JEPP-04-2020-0018>
- Raposo, M., Fernandes, C. I., & Veiga, P. M. (2021). We dreamed a dream that entrepreneurial ecosystems can promote sustainability. *Management of Environmental Quality: an International Journal*, 33(1), 86–102. <https://doi.org/10.1108/MEQ-01-2021-0010>
- Ritala, P., Gustafsson, R., Do, H., & Move, W. (2018). Q & a Paavo Ritala and robin Gustafsson. *Technology Innovation Management Review*, 8(7), 52–58. <https://doi.org/10.22215/timreview/1171>
- Schaltegger, S., & Wagner, M. (2011). Sustainable entrepreneurship and sustainability innovation: Categories and interactions. *Business Strategy and the Environment*, 20(4), 222–237. <https://doi.org/10.1002/bse.682>
- Scott, S., Hughes, M., & Ribeiro-Soriano, D. (2021). Towards a network-based view of effective entrepreneurial ecosystems. *Review of Managerial Science*, 1–31, 157–187. <https://doi.org/10.1007/s11846-021-00440-5>
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217–226. <https://doi.org/10.5465/amr.2000.2791611>
- Shepherd, D. A., & Patzelt, H. (2011). The new field of sustainable entrepreneurship: Studying entrepreneurial action linking “what is to be sustained” with “what is to be developed.”. *Entrepreneurship: Theory and Practice*, 35(1), 137–163. <https://doi.org/10.1111/j.1540-6520.2010.00426.x>
- Shvetsova, O. A., & Lee, S. K. (2021). Living labs in university-industry cooperation as a part of innovation ecosystem: Case study of South Korea. *Sustainability (Switzerland)*, 13(11), 5793. <https://doi.org/10.3390/su13115793>
- Siddaway, A. P., Wood, A. M., & Hedges, L. V. (2019). How to do a systematic review: A best practice guide for conducting and reporting narrative reviews, meta-analyses, and meta-syntheses. *Annual Review of Psychology*, 70, 747–770. <https://doi.org/10.1146/annurev-psych-010418-102803>
- Simatupang, T. M., Schwab, A., & Lantu, D. C. (2015). Building sustainable entrepreneurship ecosystems. *International Journal of Entrepreneurship and Small Business*, 26(4), 389–398.
- Spigel, B. (2017). The relational organization of entrepreneurial ecosystems. *Entrepreneurship: Theory and Practice*, 41(1), 49–72. <https://doi.org/10.1111/etap.12167>
- Spigel, B., & Harrison, R. (2008). Towards a process theory of entrepreneurial ecosystems. *Strategic Entrepreneurship Journal*, 12(1), 151–168. <https://doi.org/10.1002/sej.1268>
- Stam, E. (2015). Entrepreneurial ecosystems and regional policy: A sympathetic critique. *European Planning Studies*, 23(9), 1759–1769. <https://doi.org/10.1080/09654313.2015.1061484>

- Stam, E., & van de Ven, A. (2021). Entrepreneurial ecosystem elements. *Small Business Economics*, 56(2), 809–832. <https://doi.org/10.1007/s11187-019-00270-6>
- Suchek, N., Fernandes, C. I., Kraus, S., Filser, M., & Sjögrén, H. (2021). Innovation and the circular economy: A systematic literature review. *Business Strategy and the Environment*, May, 1–17. <https://doi.org/10.1002/bse.2834>
- Sunny, S. A., & Shu, C. (2019). Investments, incentives, and innovation: Geographical clustering dynamics as drivers of sustainable entrepreneurship. *Small Business Economics*, 52(4), 905–927. <https://doi.org/10.1007/s11187-017-9941-z>
- Takyi, L., & Naidoo, V. (2020). Innovation and business sustainability among SMEs in Africa: The role of the institutions. In Y. Gao, S. Tsai, X. Du, & C. Xin (Eds.), *Sustainability in the entrepreneurial ecosystem: Operating mechanisms and Enterprise growth* (pp. 50–74). IGI Global. <https://doi.org/10.4018/978-1-7998-3495-3.ch003>
- Talwar, S., Kaur, P., Nunkoo, R., & Dhir, A. (2022). Digitalization and sustainability: Virtual reality tourism in a post pandemic world. *Journal of Sustainable Tourism*, 1–28. <https://doi.org/10.1080/09669582.2022.2029870>
- Terama, E., Milligan, B., Jiménez-Aybar, R., Mace, G. M., & Ekins, P. (2016). Accounting for the environment as an economic asset: Global progress and realizing the 2030 agenda for sustainable development. *Sustainability Science*, 11(6), 945–950. <https://doi.org/10.1007/s11625-015-0350-4>
- Thees, H., Zacher, D., & Eckert, C. (2020). Work, life and leisure in an urban ecosystem - co-creating Munich as an entrepreneurial destination. *Journal of Hospitality and Tourism Management*, 44, 171–183. <https://doi.org/10.1016/j.jhtm.2020.06.010>
- Theodoraki, C., Dana, L.-P., & Caputo, A. (2022). Building sustainable entrepreneurial ecosystems: A holistic approach. *Journal of Business Research*, 140, 346–360. <https://doi.org/10.1016/j.jbusres.2021.11.005>
- Theodoraki, C., Messeghem, K., & Rice, M. P. (2018). A social capital approach to the development of sustainable entrepreneurial ecosystems: An explorative study. *Small Business Economics*, 51(1), 153–170. <https://doi.org/10.1007/s11187-017-9924-0>
- Tiba, S., van Rijnsoever, F. J., & Hekkert, M. P. (2020). The lighthouse effect: How successful entrepreneurs influence the sustainability-orientation of entrepreneurial ecosystems. *Journal of Cleaner Production*, 264, 121616. <https://doi.org/10.1016/j.jclepro.2020.121616>
- Tiba, S., van Rijnsoever, F. J., & Hekkert, M. P. (2021). Sustainability startups and where to find them: Investigating the share of sustainability startups across entrepreneurial ecosystems and the causal drivers of differences. *Journal of Cleaner Production*, 306, 127054. <https://doi.org/10.1016/j.jclepro.2021.127054>
- Tipu, S. A. A. (2021). Organizational change for environmental, social, and financial sustainability: A systematic literature review. *Review of Managerial Science*, 16, 1697–1742. <https://doi.org/10.1007/s11846-021-00494-5>
- Tolstyk, T., Gamidullaeva, L., Shmeleva, N., Woźniak, M., & Vasin, S. (2021). An assessment of regional sustainability via the maturity level of entrepreneurial ecosystems. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), 5. <https://doi.org/10.3390/joitmc7010005>
- Torraco, R. J. (2016). Writing integrative literature reviews: Using the past and present to explore the future. *Human Resource Development Review*, 15(4), 404–428. <https://doi.org/10.1177/1534484316671606>
- Torres Valdés, R. M., Lorenzo Álvarez, C., Castro Spila, J., & Santa Soriano, A. (2019). Relational university, learning and entrepreneurship ecosystems for sustainable tourism. *Journal of Science and Technology Policy Management*, 10(4), 905–926. <https://doi.org/10.1108/JSTPM-03-2018-0032>
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207–222. <https://doi.org/10.1111/1467-8551.00375>
- van Rijnsoever, F. J. (2022). Intermediaries for the greater good: How entrepreneurial support organizations can embed constrained sustainable development startups in entrepreneurial ecosystems. *Research Policy*, 51(2), 104438. <https://doi.org/10.1016/j.respol.2021.104438>
- Volkman, C., Fichter, K., Klofsten, M., & Audretsch, D. B. (2021). Sustainable entrepreneurial ecosystems: An emerging field of research. *Small Business Economics*, 56(3), 1047–1055. <https://doi.org/10.1007/s11187-019-00253-7>
- Vrontis, D., & Christofi, M. (2021). R&D internationalization and innovation: A systematic review, integrative framework and future research directions. *Journal of Business Research*, 128, 812–823. <https://doi.org/10.1016/j.jbusres.2019.03.031>
- Vuorio, A. M., Puumalainen, K., & Fellhoffer, K. (2018). Drivers of entrepreneurial intentions in sustainable entrepreneurship. *International Journal of Entrepreneurial Behaviour and Research*, 24(2), 359–381. <https://doi.org/10.1108/IJEBR-03-2016-0097>
- Wagner, M., Schaltegger, S., Hansen, E. G., & Fichter, K. (2021). Small Business Economics). University-linked programmes for sustainable entrepreneurship and regional development: How and with what impact? *Small Business Economics*, 56(3), 1141–1158. <https://doi.org/10.1007/s11187-019-00280-4>
- Welter, F. (2011). Contextualizing entrepreneurship—Conceptual challenges and ways forward. *Entrepreneurship Theory and Practice*, 35(1), 165–184. <https://doi.org/10.1111/j.1540-6520.2010.00427.x>
- Wurth, B., Stam, E., & Spigel, B. (2021). *Toward an entrepreneurial ecosystem research program*. Theory and Practice. <https://doi.org/10.1177/1042258721998948>
- Zhao, W., Wang, A., Chen, Y., & Liu, W. (2021). Investigating inclusive entrepreneurial ecosystem through the lens of bottom of the pyramid (BOP) theory: Case study of Taobao village in China. *Chinese Management Studies*, 15(3), 613–640. <https://doi.org/10.1108/CMS-05-2020-0210>
- Zhao, X., Shang, Y., & Song, M. (2020). Industrial structure distortion and urban ecological efficiency from the perspective of green entrepreneurial ecosystems. *Socio-Economic Planning Sciences*, 72, 100757. <https://doi.org/10.1016/j.seps.2019.100757>

How to cite this article: Chaudhary, S., Kaur, P., Alofaysan, H., Halberstadt, J., & Dhir, A. (2023). Connecting the dots? Entrepreneurial ecosystems and sustainable entrepreneurship as pathways to sustainability. *Business Strategy and the Environment*, 32(8), 5935–5951. <https://doi.org/10.1002/bse.3466>