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Exploring the debate on social innovation ecosystems: theoretical approaches, epistemes and future research agenda

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EXPLORING THE DEBATE ON SOCIAL INNOVATION ECOSYSTEMS: THEORETICAL APPROACHES, EPISTEMES AND FUTURE RESEARCH AGENDA

EXPLORANDO O DEBATE SOBRE OS ECOSSISTEMAS DE INOVAÇÃO SOCIAL: ABORDAGENS TEÓRICAS, EPISTEMES E AGENDA DE PESQUISA FUTURA

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ABSTRACT

Objectives: This study analyzes the academic debate on Social Innovation Ecosystems (SIEs) by identifying primary theoretical approaches, epistemes, progress, and gaps to formulate propositions to put forward the field's research agenda. **Theoretical Approach:** Beyond a bibliometric and descriptive thematic review, this article conducts a critical examination of the epistemological foundations in the debate. It proposes a research agenda anchored in Global South perspectives, specifically focusing on Latin America, to decolonize and expand theorization based on regional specificities. **Method:** A Systematic Literature Review (SLR) was conducted following the PRISMA guidelines using the Scopus and Web of Science databases. The documentary corpus underwent bibliometric, theoretical, and epistemological analyses, which served as the foundation for the developed recommendations. **Results:** A bibliometric and longitudinal analysis of 267 articles (with high and moderate adherence to SIE) provided a macro overview of the field. Subsequently, an in-depth qualitative examination of the 19

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high-adherence articles revealed the primary conceptualizations, frameworks, and methodologies employed, highlighting dominant analytical currents and their respective epistemological anchors. **Conclusions:** This study offers an original contribution by advancing the research agenda on SIE in both national and international contexts. By transcending thematic analysis, the article fosters new theorizations that consider diverse "ecologies of ecosystems" and geographic specificities, emphasizing the potential of research produced in the Global South and Latin America to advance the contemporary debate.

Keywords: social innovation ecosystems; social innovation; systematic literature review; theoretical and epistemological analysis.

RESUMO

Objetivos: Este estudo analisa o debate acadêmico sobre os Ecossistemas de Inovação Social (EIS), identificando as principais abordagens teóricas, epistemes, progressos e lacunas, a fim de formular proposições que façam avançar a agenda de pesquisa no campo. **Abordagem Teórica:** Para além de uma revisão bibliométrica e temática descritiva, o artigo realiza um exame crítico das bases teóricas e epistemológicas do debate. Propõe-se uma agenda de pesquisa ancorada em perspectivas do Sul Global, com ênfase na América Latina, buscando descolonizar e expandir a teorização sobre o tema a partir de suas especificidades regionais. **Método:** Realizou-se uma Revisão Sistemática da Literatura (RSL) seguindo as diretrizes PRISMA nas bases de dados Scopus e Web of Science. O corpus documental foi submetido a análises bibliométrica, teórica e epistemológica, que serviram de fundamento para as recomendações apresentadas. **Resultados:** A análise bibliométrica e longitudinal de 267 artigos (com alta e moderada aderência aos EIS) forneceu um panorama macro do campo. Subsequentemente, um exame qualitativo profundo dos 19 artigos de alta adesão revelou as principais conceituações, frameworks e metodologias empregadas, evidenciando as correntes analíticas dominantes e suas respectivas ancoragens epistemológicas. **Conclusões:** O estudo oferece uma contribuição original ao avançar a agenda de pesquisa sobre EIS nos âmbitos nacional e internacional. Ao transcender a análise temática, o artigo fomenta novas teorizações que considerem as diversas "ecologias de ecossistemas" e suas especificidades geográficas, destacando o potencial dos estudos produzidos no Sul Global e na América Latina para fazer avançar o debate na área.

Palavras-chave: ecossistemas de inovação social; inovação social; revisão sistemática de literatura; análise teórica e epistemológica.

Introduction

The quest for transformative changes toward more sustainable realities is at the core of today's scientific agenda (Gupta et al., 2024), with the fields of Management and Public Administration being central to this debate (Ergene et al., 2021). In Brazil, the climate crisis, compounded by other

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longstanding and emerging urban challenges, has demanded increasingly urgent measures for mitigation, adaptation, and transition, inviting a rethinking of urban management (Andion & Chimenti, 2024). Such processes imply new patterns of governance between the State, the market, civil society, and academia, as well as new relations between humans and nature in cities and territories. In this scenario, the debate on Social Innovation (SI) and its unfolding concepts, such as the Social Innovation Ecosystem (SIE), have garnered increasing attention within the social sciences, interpreted as viable pathways to tackle 21st-century "wicked problems".. This type of problem was first defined by Rittel and Webber (1973) as a social policy problem, for which no definitions or solutions are possible in a definite or objective mode.

Climate change, species extinction, biodiversity loss, and ocean acidification, compounded by deepening social inequalities, are just some of the "wicked problems" defining Anthropocene as an era of dominant human influence on ecosystems (Ergene et al., 2021). In response, global efforts spearheaded by the United Nations (UN, 2025) aim to tackle these challenges through the Sustainable Development Goals (SDGs). These goals themselves are often categorized as wicked due to their inherently multidimensional, multisectoral, and interdisciplinary nature. However, despite significant UN efforts, the wicked nature of sustainability challenges ensures a process whereby solving one problem often unfolds into several new ones (Kantabutra, 2024), further complicating resolutions, which can hardly be determined by a single actor or sector in isolation.

Instead, the focus must shift toward collaborative networks comprising diverse actors across multiple sectors, including civil society representatives, market agents, government institutions, academia, and local communities. Focusing on this constellation of actors implies valuing socio-state interactions and their effects on addressing complex public problems. From this perspective, studies on Social Innovation Ecosystems (SIEs) have gained traction in the broad debate on social innovation, particularly after 2020 (Alperstedt & Andion, 2021; Pel et al., 2018).

According to Alperstedt and Andion (2021), the notion of Social Innovation Ecosystems is founded on the premise that social innovation does not occur in isolation but is embedded within a complex web of actors, relationships, and practices that unfold across interconnected analytical levels (micro, meso, and macro). These ecosystems are described as "network constellations" (Pel et al., 2020a), in which public, private, civil society, academic, and community organizations and actors are mobilized around public issues. Thus, social innovation initiatives can originate in any sector either independently or through cross-sector collaboration. These processes are contextually shaped by local specificities, including cultural norms, institutional arrangements, public policies, and infrastructure networks (Kadyrova, 2024).

The significance of temporal, institutional, and territorial inscription in social innovation dynamics (Andion et al., 2022) has driven a shift from studies of isolated SIs toward investigations into SIE dynamics. Consequently, understanding how these networks address problematic situations at a local level is essential to foster the development of social innovation experiences and its impact on

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social realities (Domanski et al., 2020). In response, diverse SIE definitions and theoretical perspectives have emerged in the last decade, such as the multilevel perspective (Kaletka et al., 2016), the civic ecosystems (Rangelov & Theros, 2023), and the quadruple-helix models (Canseco-Lopez et al., 2025).

This scientific debate surrounding SIEs has intensified over recent years and was driven by a proliferation of theoretical and empirical studies rooted in diverse perspectives. These range from normative approaches that highlight general patterns and essential capabilities for any SIE (Alijani et al., 2016) to those emphasizing local experiences, empirical analysis, and territorial dynamics (Andion et al., 2020; Moulaert, 2009; Terstriep et al., 2020). However, this conceptual plurality may lead to theoretical fragmentation, potentially causing researchers to misinterpret comparative studies rooted in divergent epistemological visions.

Engaging with the SIE debate from the standpoint of the Global South, however, requires more than expanding the geographical scope of empirical settings; it demands epistemological vigilance. Latin American critical thought has long demonstrated that the production and circulation of knowledge are marked by the coloniality of power and knowledge (Quijano, 2014), which naturalizes theoretical frameworks produced in the Global North as universal while assigning to Southern realities the role of empirical "cases" to be explained by external models.

In the field of Administration, Guerreiro Ramos (1996) warned early on against the uncritical transposition of foreign concepts, proposing a "sociological reduction" through which external theories are critically assimilated in light of local realities, a caution that also inspires this review. In a converging direction, Santos (2007) proposes an "ecology of knowledges" that recognizes the plurality and incompleteness of all epistemes, including scientific ones. Assuming such perspectives does not imply refusing dialogue with Northern scholarship, a recurrent misunderstanding in the field (Abdalla & Faria, 2017), but rather qualifying this dialogue by keeping in sight the historical, institutional, and epistemological legacies that shape Global South realities (Andion et al., 2017; Monteiro, 2019).

Given the recent proliferation of studies on SIEs and their relevance to the urgent socio-ecological transition, particularly regarding Global South countries such as Brazil, where network connections and socio-state interactions have always been critical for addressing wicked public problems (Lavalle & Szwako, 2015), this study aims to analyze the evolution of the academic debate on SIEs. This Brazilian tradition of scholarship on civil society and socio-state interactions is not merely contextual: it offers a theoretical substrate for understanding why, in such contexts, SIEs tend to assume the form of public arenas of democratic experimentation rather than of mere support structures for entrepreneurs (Andion et al., 2017, 2020).

Anchored in this assumption, through a systematic literature review, this article identifies primary theoretical approaches, epistemes, progress, and gaps, proposing ways to advance the research agenda in the SIEs' field of studies. In line with this purpose, the study also proposes a research agenda anchored in Global South perspectives, with an emphasis on Latin America, seeking to decolonize and

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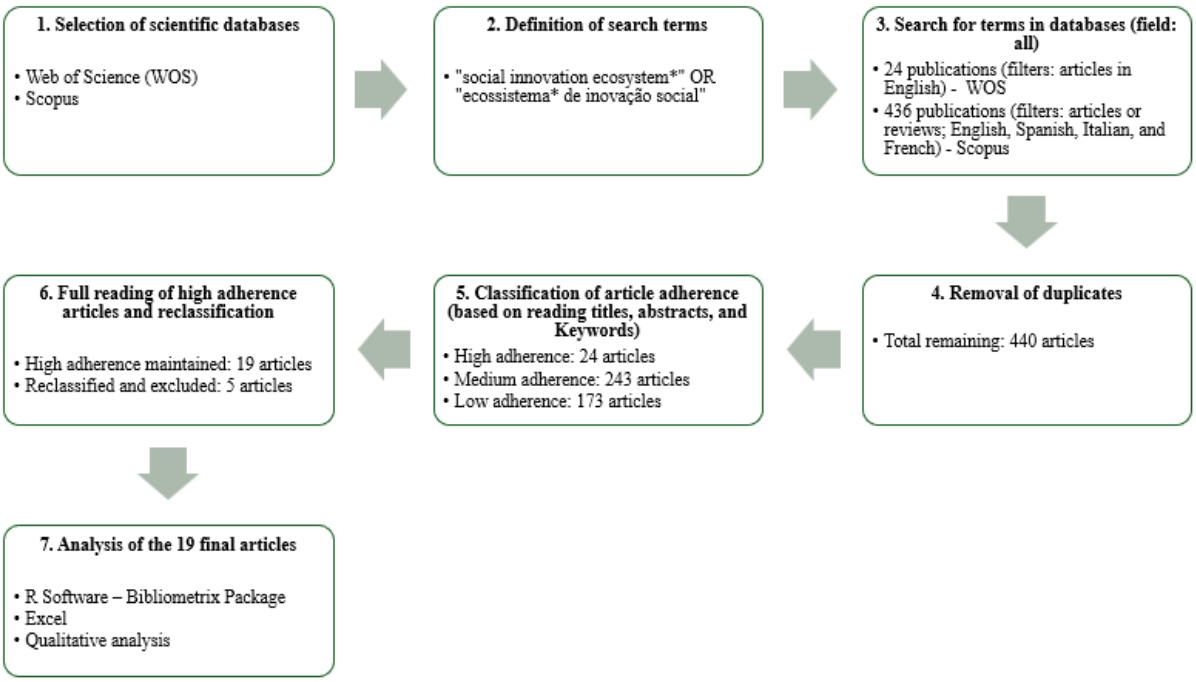
expand theorization on SIEs based on their regional specificities. This literature review followed the guidelines for such studies in the administration field proposed by Chimenti (2025).

The purpose is not merely to describe the field, but to identify controversies in theorization and to contribute to the scientific debate on SIEs, recognizing its facets that can address wicked problems and offering insights into the achievement of the SDGs. To this end, the article is structured as follows: the next section presents the methodology, which delineates the systematic review framework and its analytical procedures. Subsequently, the results and discussion section is organized into three distinct parts: (a) a bibliometric, thematic, and longitudinal overview of the corpus; (b) a qualitative reflection on the theoretical underpinnings of the SIE debate; and (c) an examination of epistemological streams and their implications for the conceptualization of SIEs. The final section provides concluding remarks, highlighting the study's main contributions, and proposing a future research agenda.

Methodology

This systematic review followed PRISMA guidelines (Page et al., 2022). Figure 1 illustrates the seven methodological steps. The first stage was database selection. Web of Science and Scopus were chosen because of their global and multidisciplinary reach, allowing metadata to be imported into R software and analyzed using the bibliometrix R-package (Aria, 2021; Aria & Cuccurullo, 2017).

Figure 1. Systematic review process.



Note. Developed by the authors.

The search terms were defined as follows: “social innovation ecosystem*” OR “ecossistema* de inovação social”. The search was conducted across all database fields without temporal or

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disciplinary constraints. This approach aimed for an integrative review, requiring the analysis of papers aligned with SIE theory even when the specific term was absent from metadata (titles, abstracts, or keywords). Restricting searches to specific metadata fields is advisable in consolidated themes, in which the volume of publications is substantial (Chimenti, 2025); in emerging debates such as that on SIEs, however, searching across all fields broadens the capture of relevant works.

Two clarifications regarding language coverage are warranted. The Portuguese descriptor was deliberately included as a redundancy, given the study's specific interest in the Brazilian debate. The absence of a Spanish descriptor (e.g., "ecosistema de innovación social"), in turn, does not exclude Spanish-language production indexed in the selected databases: Scopus indexing policy requires the title, abstract, and keywords of every record to be available in English, regardless of the language of the full text (Elsevier, 2025), while in Web of Science the language filter was restricted to English. Consequently, Spanish-language articles mobilizing the concept carry the equivalent English expression in their metadata and are retrieved by the search string as evidenced by the presence of Spanish-language titles in the corpus (see Figures 4 and 5). The effective boundary of the corpus concerns database coverage rather than search language, as discussed in the limitations section.

Afterwards, the type of publication was filtered to articles and the language to English, and 24 publications remained in Web of Science. In Scopus, reviews and articles were selected in five languages (English, Spanish, Portuguese, Italian, and French), with 436 publications remaining. Metadata was exported from databases, imported, and merged with bibliometrix, allowing the automatic exclusion of duplicates. The database was then exported to an Excel spreadsheet for submission to an evaluation by a panel of researchers.

The researchers categorized 440 articles in terms of adherence to SIEs after reading the titles, abstracts, and keywords. Adherence was operationalized at three levels: articles were classified as highly adherent when SIEs constituted the central object of the study, that is, when the concept appeared in the research problem or objectives and was theoretically or empirically developed; as moderately adherent when the concept was mobilized as context or background, without constituting the object of analysis; and as of low adherence when the term was mentioned only in passing. Classification divergences among panel members were resolved by consensus. After discarding 173 low-adherence articles, an exploration of bibliometric data of 267 articles was performed. Subsequently, moderate- and high-adherence publications were read to obtain a wider view of the debate. The high-adherence criterion was met by 24 articles, which were fully read; five were subsequently reclassified and excluded, since they only mentioned SIEs without focusing on the topic.

The 19 highly adherent papers were analyzed in depth with an Excel spreadsheet and biblioshiny, an app that runs in bibliometrix package (version 4.3.0) in R software (version 4.3.3). The spreadsheet allowed researchers to share their views with each other about the articles and standardize their perceptions to develop a qualitative analysis of the existing definitions of SIE. A keyword cloud was created using the WordArt website.

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Beyond the bibliometric analysis of the general corpus and the in-depth examination of the most relevant articles, the study performed a longitudinal and epistemological critique of the debate. This research aimed to identify the primary theoretical epistemic currents in social ecosystem studies, along with their key characteristics and implications for theorization and conceptualization within the field. This comprehensive analysis allowed for the identification of advances and gaps that were considered in the proposition of a future research agenda, as proposed in the final considerations section. During the preparation and revision of this article, the authors used the artificial intelligence tools Gemini (Google) and Claude (Anthropic) to assist with the drafting and revision of the text, including improvements to the flow and cohesion of the English language, and with the normalization of references. Following the use of these tools, the authors reviewed, edited, and validated all content and assume full responsibility for the content of the publication.

Results and discussion

This section details the main results and discussion of the review, organized into three analytical stages. First, a macro-perspective of the field is established through a bibliometric and thematic analysis of 267 articles categorized as having high or moderate adherence to the SIE theme. Subsequently, a more granular examination of the 19 high-adherence articles is conducted, providing a qualitative analysis of their theoretical approaches, including core conceptualizations, frameworks, and methodologies. Finally, a critical analysis identifies the predominant epistemological currents within the debate, uncovering research gaps and offering propositions to advance the research agenda on SIE.

A broader perspective on the SIE scientific debate: bibliometric and thematic analysis

The 267 documents analyzed were published across 153 distinct journals between 2016 and 2025, indicating that the discourse has consolidated over the last decade, gaining significant momentum in the post-pandemic period. The annual growth rate in publications reached 16.65%, with an average document age of 2.6 years. Furthermore, the average citation rate was 14.1 per article. Authorship is predominantly collaborative: only 37 of the 267 documents (13.9%) are single authored, involving a total of 770 authors. The field's dispersion is manifested in the distribution across outlets (267 articles spread over 153 distinct journals) and in its conceptual fragmentation, expressed by 899 distinct keywords; its emergent character, in turn, is indicated by the recent average age of documents (2.6 years) and by the high annual growth rate.

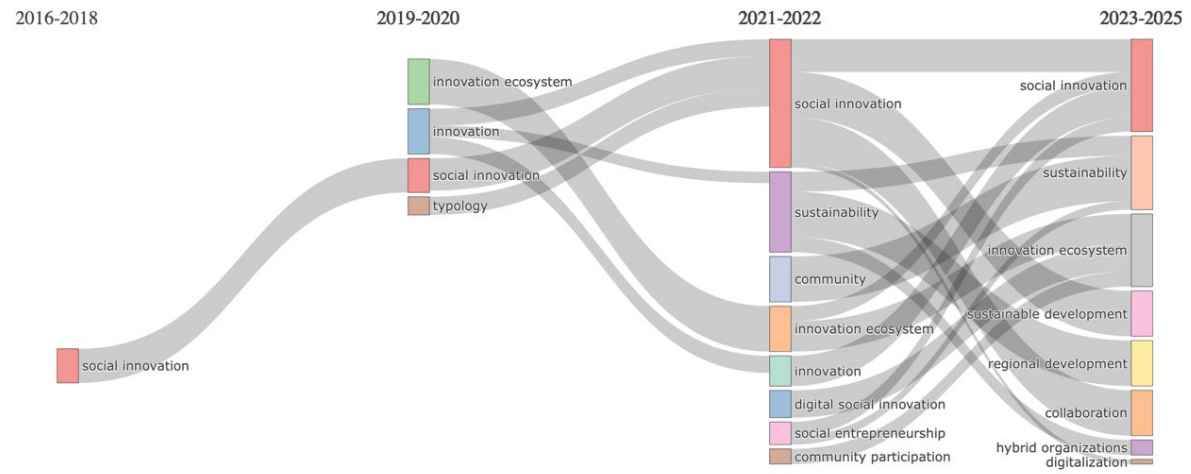
The majority of authors and journals originate from Northern countries, particularly Europe (Germany, Portugal, France, and the Netherlands) and North America (the United States and Canada). However, there is a notable presence of authors from Latin America, primarily from Brazil and Mexico. Regarding the most cited journals, European Planning Studies and Sustainability stand out.

Beyond this general view, there were two outstanding topics regarding this larger corpus of analysis, one related to the conceptualization and the other to the article titles.

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Regarding conceptual evolution, keyword analysis reinforced the argument that social innovation forms the conceptual base of SIEs' studies as discussed by Alperstedt and Andion (2021), since the word remains in each period. The analysis defined four different periods based on three cut-off years: 2018, 2020, and 2022, as shown in Figure 2.

Figure 2. Thematic evolution based on keywords analysis.



Note. Developed by the authors through biblioshiny.

Further insights emerge from the longitudinal analysis of keywords across distinct periods. For instance, between 2019 and 2020, terms such as "innovation," "innovation ecosystem," and "typology" are predominated. Subsequently, "social innovation" appeared with greater frequency, signaling a specialization of the debate that transcends a purely technological focus (Ezponda & Malillos, 2011) to seek a deeper understanding of SIE specificities. The emergence of newer terms, such as "community," "participation," "sustainability," "regional development," and "collaboration", indicates that the discourse is moving beyond a functionalist perspective toward more inclusive and territorial dimensions.

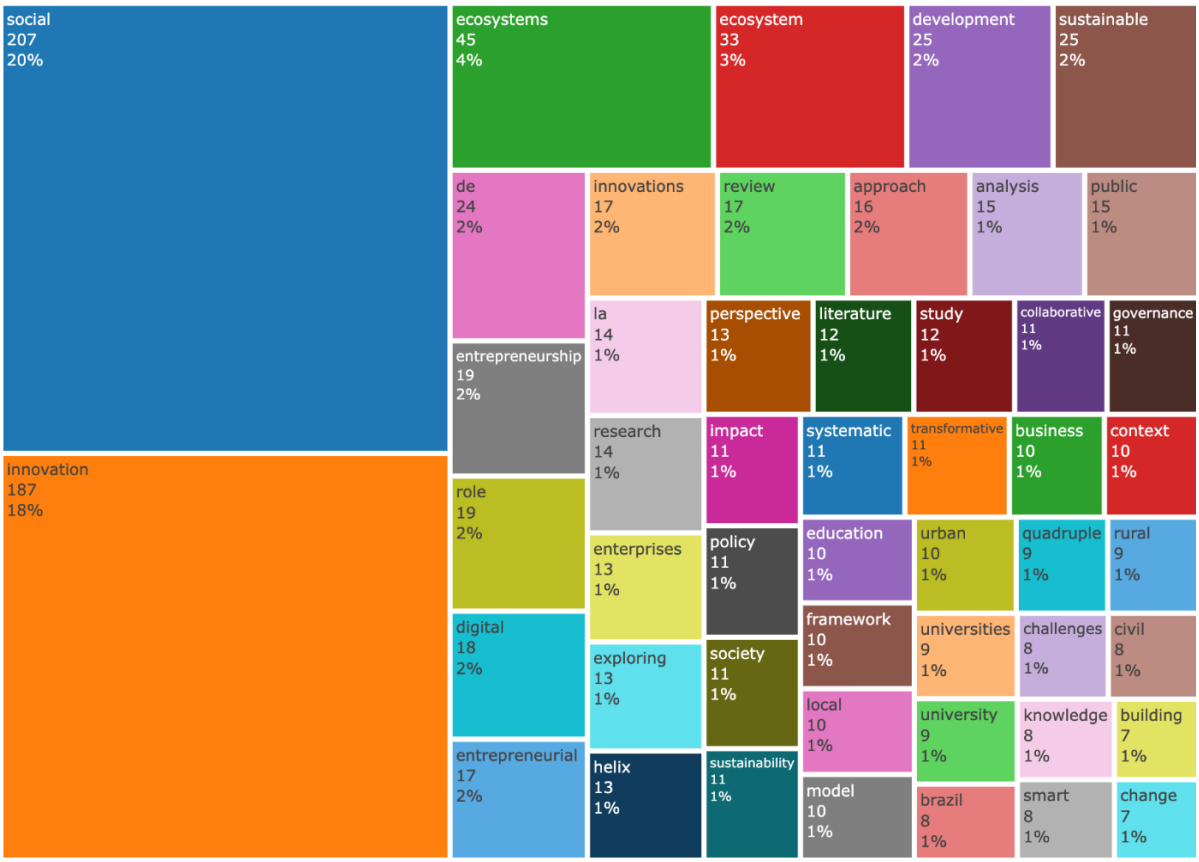
Comparing word connections between the periods 2021–2022 and 2023–2025, it is evident that the primary focus on social innovation dynamics has diversified into themes of sustainable development, regional development, collaboration, digitalization, and social entrepreneurship. Regarding the first three, their intersection with SIEs indicates that ecosystemic practices foster collaborative pathways and new territorial dynamics, thereby contributing to the achievement of the SDGs (Cunha et al., 2022; Moulaert et al., 2013). Conversely, the prominence of 'digitalization' reflects the growing impact of digital platforms and technologies on social innovation, a debate that has intensified in recent years, particularly in the post-COVID-19 landscape (Bucio-Mendoza & Solis-Navarrete, 2025; Muller et al., 2024).

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Finally, while social entrepreneurs often drive social innovation to resolve local issues, it is imperative to distinguish social entrepreneurship from SIEs, as these constructs are frequently, yet erroneously, conflated in the literature (Alperstedt et al., 2023). While terms like social entrepreneurship and social enterprises may align with SIEs, they can also reflect concepts such as Social Entrepreneurial Ecosystems or Social Business Ecosystems, which often emphasize the figure of the "heroic entrepreneur" over networked relationships.

Regarding the title analysis, unigrams, bigrams, and trigrams were considered, with a constraint related to the maximum of 50 terms. No words were excluded from this process. A tree map containing unigrams is shown in Figure 3.

Figure 3. Title analysis – Unigrams.



Note. Developed by the authors through biblioshiny.

As illustrated in Figure 3, the unigram analysis reveals that the most frequent terms in titles are "social" (207), "innovation" (187), "ecosystems" (45), "ecosystem" (33), "development" (25), and "sustainable" (25). The high frequency of the first four terms underscores the consolidation of "Social Innovation Ecosystem(s)" as a central construct, a finding corroborated by the trigram analysis. The prominence of "development" and "sustainable" suggests a robust link between SIEs and sustainability frameworks, specifically the United Nations' 2030 Agenda and the SDGs (UN, 2015). Beyond the themes linked with sustainability, other terms in Figure 3 delineate emerging research streams within

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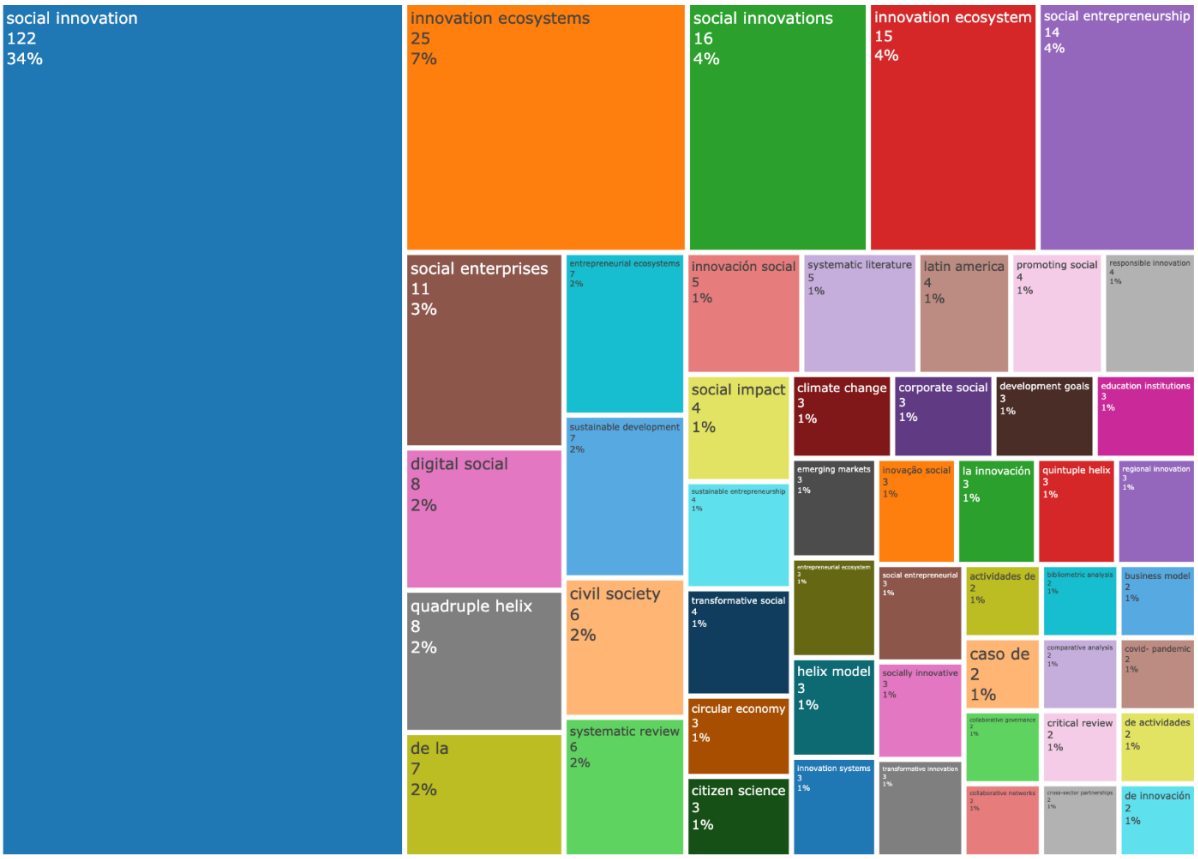
the SIE debate. On one hand, a cluster of words associated with management and entrepreneurship stands out, including “business,” “entrepreneurial,” “digital,” “helix,” and “enterprises.” Conversely, a second group focuses on public governance and urban development, featuring terms such as “transformative,” “policy,” “collaborative,” “civil,” “governance,” and “challenges.” Finally, a third set of keywords relates to science and education, specifically “universities,” “research,” and “knowledge.”

Regarding the bigrams illustrated in Figure 4, the most frequent lexical pairings in titles were “social innovation” (122), “innovation ecosystems” (25), “social innovations” (16), “innovation ecosystem” (15), “social entrepreneurship” (14), “social enterprises” (11), “digital social” (8), and “quadruple helix” (8). The high frequency of “social innovation” reflects both its foundational relevance to the SIE debate and its expansive conceptual application. This trend confirms that as scientific interest in social innovation intensifies, the term has become a dominant descriptor within the field's growing literature (Monteiro, 2019).

While the term “innovation ecosystems” is inherently linked to SIEs, the former often prioritizes technocentric ecosystems and classical economic cycles. The discussion about “digital social innovation” in the same way, is sometimes related to a technocentric focus that may diverge from the relationship-oriented and practice-based views of SIEs championed by scholars such as Andion et al. (2020, 2022), Domanski et al. (2020), and Pel et al. (2020a). Furthermore, the prevalence of management-centric terminology reflects the influence of business-oriented models on the SIE discourse, a trend also evident in the debate over triple- and quadruple-helix models. As advanced by Carayannis et al. (2021), these frameworks invite the integration of industry, government, academia, and civil society to foster social innovation through a multisectoral governance perspective.

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Figure 4. Title analysis – Bigrams.



Note. Developed by the authors through biblioshiny.

In the trigram analysis, half of the 50 terms appeared only once and 17 appeared only twice, showing a thematic dispersion of the debate. Therefore, the discussion focuses on those appearing more than three times, excluding “la innovación social” and “digital social innovation”, which were addressed earlier. The most frequent trigrams were “social innovation ecosystems” (9), “social innovation ecosystem” (5), “systematic literature review” (5), “promoting social innovation” (4), “transformative social innovation” (4), and “sustainable development goals” (3).

SIEs appeared in the titles of 14 of 267 articles (5.24%), which did not include all 24 articles categorized as highly adherent. Therefore, while the presence of the term in the title is a strong indicator that the article focuses on SIEs, its absence is inconclusive. Authors are encouraged to use the term in their titles when SIEs are their focus; the frequency of “systematic literature review”, in turn, likely reflects the PRISMA guideline of signaling the review type in titles (Page et al., 2022).

The trigram “promoting social innovation” may indicate articles focusing on the diffusion or communication of social innovation practices, whether they involve ecosystems or not. On the other hand, transformative social innovation, a concept proposed by Pel et al. (2020b), is highly aligned with SIEs discussion due to its emphasis on relationships and institutional and socio-material transformation

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through social innovation practices. Finally, the appearance of sustainable development goals affirms the alignment of SIEs with necessary social innovations to achieve the UN SDGs.

Figure 5. Title analysis – Trigrams.



Note. Developed by the authors through biblioshiny.

A closer look at the scientific debate on SIEs: an analysis of the most adherent articles

This section examines specific dimensions of the SIE debate, including temporal development, geographical distribution, and the prevailing theoretical and methodological approaches, considering the main articles identified in the systematic literature review. The discussion centers on a subset of 19 studies identified as having high thematic alignment with the SIE concept. By narrowing the scope to these high-adherence articles, we provide a more granular and critical exploration of the core frameworks, conceptual, and epistemological nuances currently shaping the field.

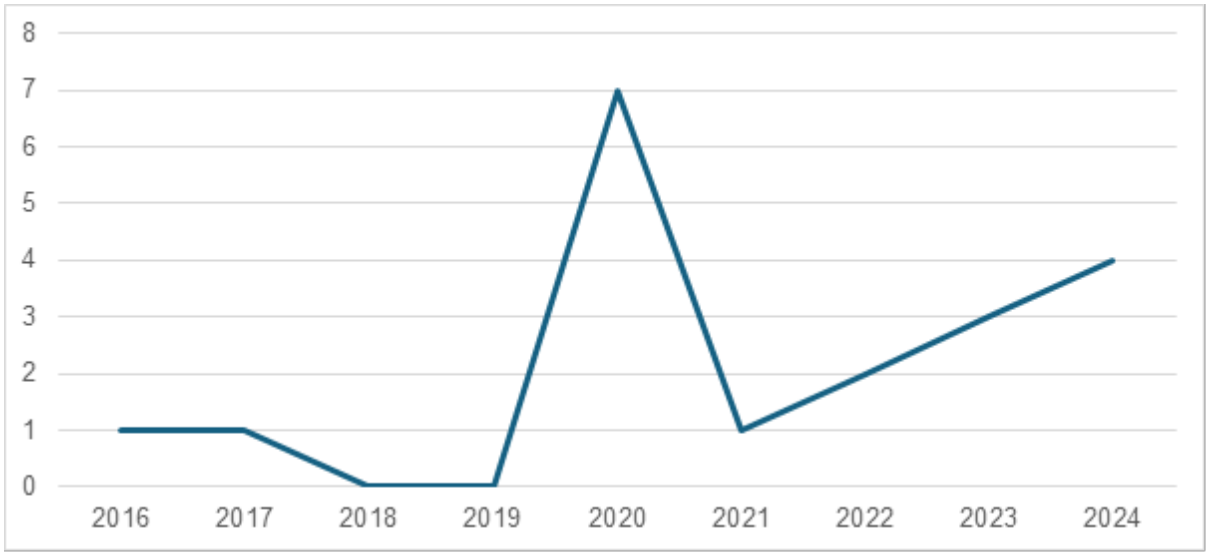
- *Temporal and geographical distribution*

Figure 6 illustrates the annual distribution of publications within the high-adherence subset. The study by Alijani et al. (2016) emerges as a seminal work, pioneering the assessment of driving factors and barriers in the development of SIEs. While one article was published in 2017 (Slimane & Lamine, 2017), no additional work emerged in the subsequent two-year period. The year 2020

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represents a significant turning point with seven articles, the highest frequency in the historical timeline, marking the onset of continuous annual production. This 2020 peak likely reflects the COVID-19 pandemic context, which underscored the urgency of innovative perspectives and cross-sector collaboration to address complex social problems. Furthermore, this scenario acted as a "test situation," creating a window of opportunity to rethink and implement more collaborative and transformative social practices.

Figure 6. Number of articles per year.



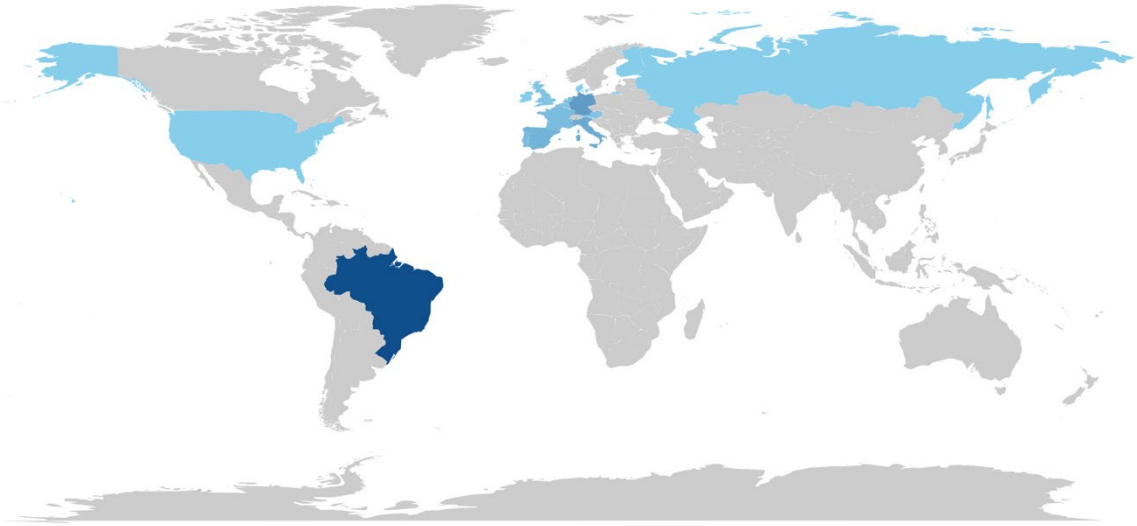
Note. Developed by the authors.

Geographical distribution was analyzed by considering the authors' nationalities, the empirical focus of the research, and the most frequently cited countries. For theoretical studies, the first author's affiliation determined the location of origin. Among the 19 high-adherence articles, seven focused specifically on European nations, five were comparative studies within Europe, four were conducted in Brazil, and three adopted a global comparative perspective. These findings confirm a Eurocentric predominance in the conceptual development of SIEs. This concentration suggests that current theoretical frameworks are largely grounded in the institutional contexts of the Global North, potentially overlooking the unique socio-state interactions prevalent in the Global South.

Figure 7 illustrates scientific production by country, where the color intensity corresponds to the volume of publications. Notably, Brazil emerges as the leading country in terms of high-adherence studies, followed by Germany and Italy. Conversely, Figure 8 presents a different landscape regarding the total number of citations per country for the first author. A comparison of both figures reveals a disparity between production volume and citation impact: Brazil, despite its leading output, ranks fourth in total citations. The top three positions in citation impact are held by Germany, Austria, and Belgium, reinforcing the dominance of European institutions in shaping the global discourse on SIEs.

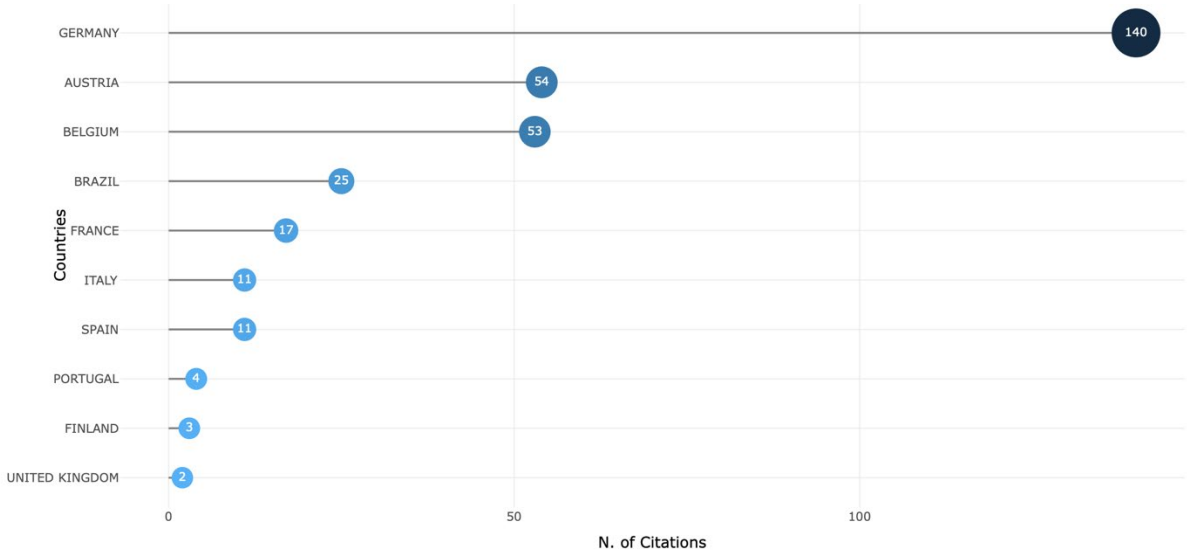
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Figure 7. Production by country.



Note. Developed by the authors through biblioshiny.

Figure 8. Citations by country.



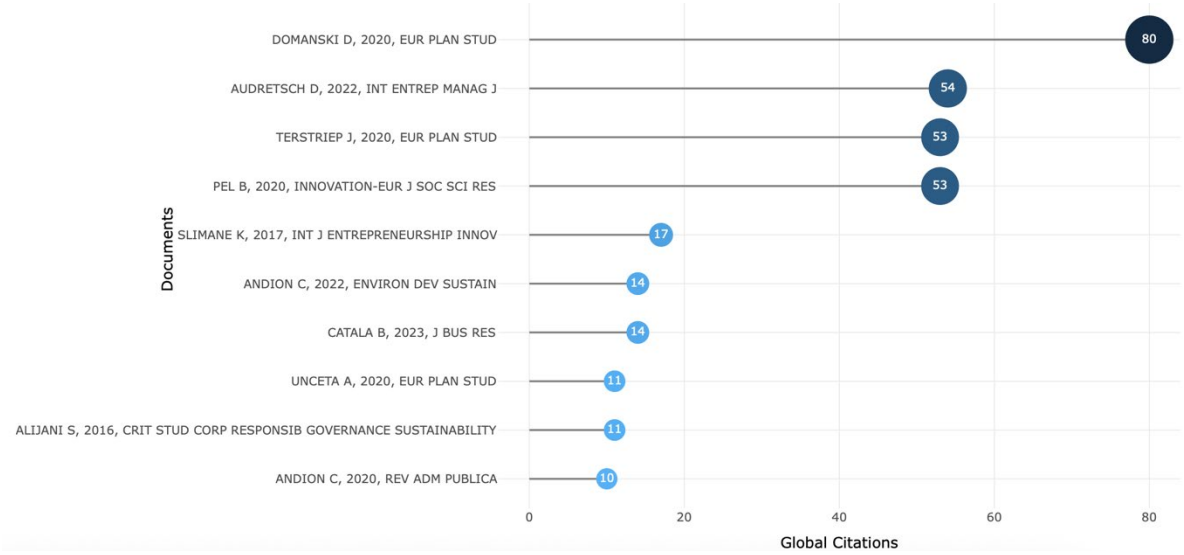
Note. Developed by the authors through biblioshiny.

Consistent with Figure 8, Figure 9 displays the global citation counts for the articles within this study's corpus. The data reveals a significant paradox: while Brazil leads in publication volume regarding SIEs, European studies maintain a distinct advantage in terms of global citations. This disparity underscores the structural inequalities inherent in academic knowledge production, such as limited access to high-impact databases, and the restricted diffusion of journals published in Brazil and other Global South nations. Furthermore, this citation gap reflects a broader geopolitical asymmetry, in which Southern perspectives often remain peripheral despite their empirical richness.

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This pattern gains analytical depth when read through the lens of the coloniality of knowledge (Quijano, 2014): the international division of academic labor tends to assign to the South the role of supplier of empirical cases, while reserving to the North the prerogative of theorization. In the SIE debate, therefore, the asymmetry is not merely quantitative: it conditions which conceptualizations circulate as "general theory" and which remain framed as "local experience", an issue taken up in the research agenda proposed in the final section.

Figure 9. Global citations of articles.



Note. Developed by the authors through biblioshiny.

- *Thematic analysis*

Analysis of the keywords within the high-adherence subset (Figure 10) revealed 71 unique terms. After consolidating plural variations (e.g., "city/cities"), 66 distinct keywords remained for analysis. Approximately 83% of these terms (55) appeared in only a single paper, represented in yellow in Figure 10, underscoring a significant thematic dispersion even among the most central articles in the field. Conversely, the 11 terms highlighted in black represent keywords shared by at least two papers. Among these, "social innovation" stands out, appearing in 14 articles. Its predominance reinforces the intrinsic link between SIEs and social innovation, corroborating the perspective that the SIE framework represents a theoretical evolution of social innovation research (Alperstedt & Andion, 2021; Cajaíba-Santana, 2014; Domanski et al., 2020). Furthermore, the terms "ecosystem(s)" and "social innovation ecosystem(s)" were identified in seven articles each, further evidencing the deliberate application of ecosystem approach to the social innovation field.

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Figure 10. Keyword cloud.



Note. Developed by the authors through WordArt.

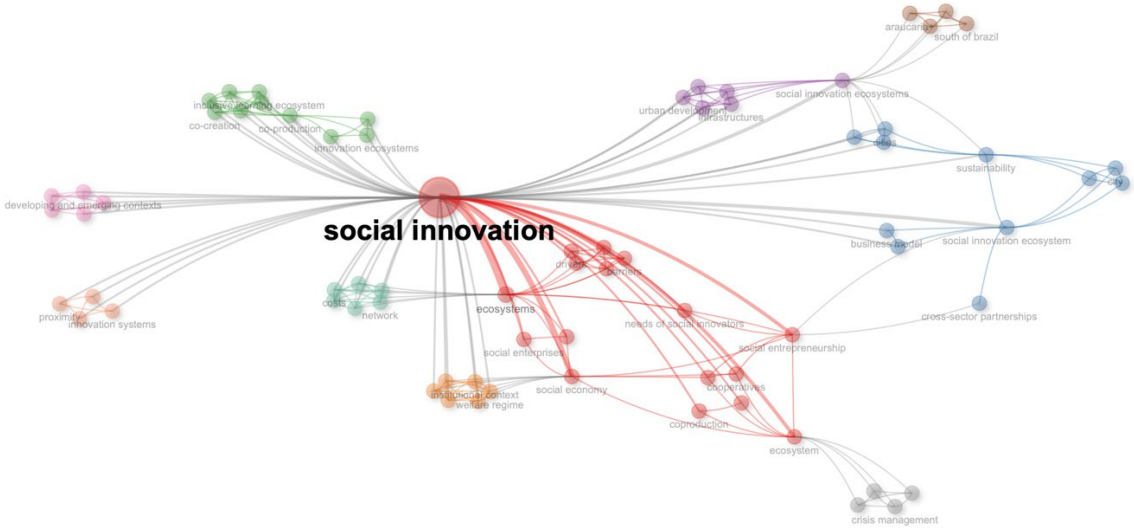
The presence of keywords such as “cities,” “urban development,” “network,” and “coproduction” reveals a significant interface between SIEs discussion and the domains of public policy and public governance, focusing on the multiplicity of actors mobilizing for social change. Similarly, the terms “social economy,” “cooperatives,” and “social entrepreneurship”, each appearing in three publications, suggest a complex intersection with the SIE framework. However, the recurring use of these established concepts also points to a lack of clear thematic boundaries, indicating that the specific theoretical identity of SIEs is still being delineated amidst overlapping research traditions. Finally, the term 'sustainability' reaffirms the intrinsic link between the SIE debate and global challenges related to socio-ecological transitions.

The thematic network analysis, based on keyword co-occurrence and clustered via the walktrap algorithm (Figure 11), reveals a high-density core centered on “Social Innovation”. While the primary cluster (red) expectedly consolidates foundational concepts such as social economy, entrepreneurship, and ecosystems, its composition exposes a critical conceptual gap. Despite the thickness of edges connecting these central nodes, terms representing the spatial and strategic frontier of the field, such as sustainability, cross-sector partnerships, and urban development, remain relegated to peripheral, less integrated clusters (e.g., blue and purple).

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Although the main cluster contains terms aligned with SIE and the studies examined in this review, such as barriers and drivers (Andion et al., 2020; Biggeri et al., 2017; Catala et al., 2023; Cortese et al., 2024; Pel et al., 2020a) and complexity (Andion et al., 2020; Nepomuceno et al., 2023), the peripheral positioning of "city" and "urban development" is particularly telling. It suggests that while Social Innovation Ecosystems (SIE) are theoretically linked to broad social economy frameworks, their integration with urban territory and city-scale governance is still fragmented in the literature, especially if the keywords are considered a core of the studies. This visual evidence strengthens the argument for a research agenda focused on situated SIE, moving beyond generic organizational drivers toward a localized, city-centric understanding of social change.

Figure 11. Thematic analysis of keyword co-occurrence.



Note. While the red cluster consolidates established organizational concepts, the blue and purple clusters highlight emerging spatial themes, such as city and urban development, which remain theoretically distant from the central core of the current literature.

- *Theoretical analysis*

A qualitative theoretical analysis of the main articles focused on three major points: (1) the objective of the research, (2) the main type of discussion in each study, and (3) the existence of concepts related to the SDGs based on the premise that SIEs require collaboration between the actors involved to solve complex problems.

To this end, the aim of each fully reviewed article was identified. As the objectives were distinct, it was decided to categorize them according to the factor considered the focus of the research. Thus, in terms of objective: three articles were considered to have a greater focus on the entrepreneur and their characteristics (Audretsch et al., 2022; Catala et al., 2023; Cortese et al., 2024), six were related to the conceptualization of SIE (Andion et al., 2020; Domanski et al., 2020; Pel et al., 2020a;

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Pinto et al., 2021; Silva et al., 2020; Slimane & Lamine, 2017), and ten were focused on SIE analysis (Alijani et al., 2016; Andion et al., 2022; Cosimato et al., 2024; Dantas et al., 2023; Kadyrova, 2024; Krüger & David, 2020; Nepomuceno et al., 2023; Perikangas et al., 2024; Terstriep et al., 2020; Unceta et al., 2020).

In terms of discussion, the comprehensive analysis of the selected articles enabled their classification into three thematic clusters based on their primary contribution to the SIE field: (a) Definition of SIE, (b) Analysis and Examples of SIE, and (c) Conceptual Frameworks. Given the multifaceted nature of the research, several studies were identified as contributing to multiple clusters; consequently, the total count across categories exceeds the number of individual articles analyzed. The following sections provide a synthesized overview of the core contributions identified within each group.

(a) Definitions of Social Innovation Ecosystems (SIEs)

In the six articles categorized as "Definition of SIEs" (Andion et al., 2020; Domanski et al., 2020; Pel et al., 2020a; Pinto et al., 2021; Silva et al., 2020; Slimane & Lamine, 2017), the authors propose an interpretation and definition of the concept of SIE. The literature reveals a significant paradigm shift from individualistic, entrepreneur-centered models toward systemic and territorial perspectives. This conceptual evolution is built upon four primary pillars:

- Relational Dynamics and Trust: SIEs are defined by recurring interactions rooted in mutual trust and interdependence. These relationships transcend traditional market pricing or formal hierarchies, operating instead through social capital and shared values (Slimane & Lamine, 2017).

- Public Arenas and Territoriality: SIEs function as collective spaces where diverse actors mobilize to interpret, investigate, and act upon public problems. These arenas are at the same time spaces to cooperation and conflict, and they are deeply embedded in specific historical and territorial trajectories (Andion et al., 2020; Cefaï, 2017). Pinto et al. (2021) further situate this at the meso-level, where market and non-market interactions converge to generate innovative responses to social needs.

- Environmental and Heuristic Models: Rather than focusing on a single “heroic” innovator, these models emphasize the environment. They are defined by local rootedness, translocal connectivity, and discursive resonance (Pel et al., 2020a), involving a comprehensive network of both human and non-human actors comprising actors, legislation, norms, relationships, policies, institutions, and cultures (Kadyrova, 2024). This environment reinforces inter-sectoral cooperation and the creation of governance structures that support collaborative actions for social innovation (Domanski et al., 2020)

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- Multi-Helix and Systemic Integration: Aligned with the Quadruple Helix framework, SIEs represent enduring partnerships between citizens, government, academia, and industry, aimed at enhancing collective well-being and public value (Catala et al., 2023; Dantas et al., 2023). These actors interact and share capabilities and resources, whether financial or not, with the objective of addressing social problems in an innovative way, promoting positive impact or mitigating negative effects on society (Silva et al., 2020).

Synthesizing these contributions, the SIE can be defined as a dynamic territorial arrangement formed through the collaborative interaction of diverse publics that mobilize and produce agency upon the local public problems, including individuals, organizations, objects and lived environments. Guided by shared values and mutual interdependence, these actors have the potential to develop innovative responses to the "wicked problems" that they face. These ecosystems have singular "ecologies" and operate across multiple scales (local, regional, and global) and are shaped by the interplay of normative, cultural, institutional, and political elements.

By reconfiguring social relations, power structures and transactions with nature, the SIEs constitute fertile environments for democratic experimentation, exercise of public problems resolution, co-construction of knowledge, and dissemination of learning. Ultimately, they could promote sustainable social transformations by transcending individualistic approaches and leveraging the collective potential of collaborative action, taking into account the ecological prudence and the interaction between humans and non-humans (Latour, 2012).

(b) Analysis and Examples of SIEs

The ten articles categorized under "Analysis and Examples of SIEs" (Alijani et al., 2016; Andion et al., 2020, 2022; Cortese et al., 2024; Cosimato et al., 2024; Dantas et al., 2023; Kadyrova, 2024; Nepomuceno et al., 2023; Perikangas et al., 2024; Pinto et al., 2021) serve as the empirical backbone of the field, offering diverse methodological approaches to studying these ecosystems *in situ*. Primarily utilizing single or multiple-case study designs, these works transcend mere descriptions to provide robust analytical frameworks. They delineate the operational dynamics of SIEs by examining real-world examples, thereby bridging the gap between abstract conceptualization and the practices of ecosystem governance and functioning.

These empirical studies highlight the operational reality of SIEs as living spaces of tension, cooperation, and experimentation, highlighting:

- Response to Wicked Problems: Articulation among multiple actors serves as a collective response to challenges that are difficult to define and solve (Rittel & Webber, 1973). For instance, Nepomuceno et al. (2023) illustrate how ecosystems manage conflicts and negotiations in environmental preservation (SDG 15).

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- Strategic Cooperation: Essential elements for SIE functionality include willingness to collaborate, open communication, shared goals, and resilience (Perikangas et al., 2024). Digital platforms, such as the Observatory of Social Innovation of Florianópolis (OBISF), act as vital instruments for co-constructing solutions within these arenas (Andion et al., 2020).

- Geographical and Multiscale relations: Analysis ranges from situated, city-specific lenses (Kadyrova, 2024) to broader institutional perspectives (Cortese et al., 2024). Regardless of scale, the consensus remains that in the absence of active social relationships, there is no ecosystem, only uncoordinated efforts.

- Critical, pragmatist, and transformative perspectives: By fostering concrete experimentation and bridging diverse modes of existence, SIEs contribute to the co-construction of knowledge and the creation of more democratic, sustainable, and equitable development pathways. Ultimately, these ecosystems facilitate the building of more inclusive and collaborative futures (Andion et al., 2022; Pel et al., 2020a).

Giving greater prominence to these experiences reveals the empirical substance of the field. Andion et al. (2020, 2022) analyze the SIE of Florianópolis (Brazil) through the Social Innovation Observatory (OBISF), a digital platform that maps hundreds of initiatives and follows their effects upon the city's public arenas; Nepomuceno et al. (2023) examine the Araucária+ initiative, showing how heterogeneous actors negotiate conflicts around the preservation of the Atlantic Forest in southern Brazil. Kadyrova (2024) compares the structures of urban SIEs in Manchester, Utrecht, Stockholm, Sofia, and Budapest, evidencing how institutional contexts shape ecosystem configurations; and Perikangas et al. (2024) investigate the co-production of social innovations by social enterprises in Finland. It is in such situated experiences that the practical contributions of the SIE debate become most tangible.

(c) Conceptual Frameworks in SIEs

The nine articles categorized as "Conceptual Frameworks" offer diverse models for the analysis, evaluation, and measurement of SIEs. While most of these studies (Alijani et al., 2016; Audretsch et al., 2022; Catala et al., 2023; Cosimato et al., 2024; Slimane & Lamine, 2017; Unceta et al., 2020) utilize visual representations to illustrate their proposals, others (Domanski et al., 2020; Terstriep et al., 2020) build their frameworks on foundational social theories and Regional Innovation Systems (RIS) to explain ecosystemic dynamics.

The identified frameworks can be analyzed through three primary lenses:

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- Component-Based and Normative Models: Several frameworks adapt traditional entrepreneurship models to social contexts. For example, Audretsch et al. (2022) identify six pillars (Policy, Finance, Culture, Support, Human Capital, and Market) derived from Isenberg's model for entrepreneurship ecosystems. Similarly, Catala et al. (2023) categorize what they term the "Social Economy Ecosystem" into knowledge and operational dimensions. These models tend to view the ecosystem as a structured set of manageable components.

- Measurement and Impact Assessment: A significant effort within the field is dedicated to quantifying ecosystem maturity. Unceta et al. (2020) propose a metric based on social innovation dynamics and their underlying factors. In a similar vein, Catala et al. (2023) suggest a scoring system for ten distinct factors to assess ecosystem performance, bridging the gap between qualitative characteristics and quantitative evaluation.

- Processual and Dynamic Perspectives: In contrast to static structures, some authors view the SIE as a dynamic process. Slimane and Lamine (2017) define the ecosystem as a coordinated process of social innovation occurring within a network, primarily analyzed through a transaction-based approach.

The analysis of these articles reveals that SIE frameworks generally converge on four common stages or characteristics: (1) individual or organizational readiness; (2) network formation based on problem identification; (3) collective development of social innovative practices; and (4) the institutionalization of these practices within the territory. However, fundamental tension remains. While normative models provide structural clarity, they often struggle to capture the systemic complexity (Domanski et al., 2020) and the relational plasticity (Terstriep et al., 2020) inherent in social change. This complexity makes it difficult to conceptualize the SIE in a strictly linear or evolutionary manner. To address this, Cosimato et al. (2024) propose a spiral model, representing the non-linear scaling of social innovation, from micro-level connections to macro-societal impact, characterizing ecosystem emergence as non-intentional, iterative, and often unpredictable process.

Finally, regarding the relationship between SIEs and SDGs, the 2030 Agenda serves in the debate as both a driver and a metric for SIE activities:

- Operationalizing the 2030 Agenda: SIEs provide the multisectoral logic necessary to address the "wicked" nature of SDGs, such as poverty and inequality. They act as "laboratories" for experimentation where global goals are territorialized and adapted to local realities (Andion et al., 2022).

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- Strategic Alignment with SDG 11: By transforming urban spaces into inclusive and resilient environments, SIEs directly contribute to the targets of Sustainable Cities and Communities (Goal 11) (Kadyrova, 2024).

- Legitimacy and Impact: The SDGs provide an international framework which guides and qualifies local initiatives. Aligning SIEs with these targets allows for better measurement, comparison, and replication of social innovations across different territories, fostering systemic transformation and social justice (Cortese et al., 2024; Dantas et al., 2023).

- *Epistemological analysis*

The preceding analysis demonstrates that while the debate on Social Innovation Ecosystems (SIE) is relatively recent, it has acquired significant density and relevance. This proliferation of studies has fostered diverse theoretical and paradigmatic approaches; although they address the same phenomenon, they do not necessarily share the same ontological foundations. As the field matures, three distinct analytical currents emerge, reflecting different epistemes applied to the study of ecosystems. Given the still-incipient stage of consolidation of the debate, we deliberately characterize them as emerging analytical currents rather than consolidated schools of thought.

(a) The Functionalist-Managerial Current

The first current is predominantly theoretical and seeks to establish "ideal types" of ecosystems, viewed as abstract constructs that can be rationally designed and managed. Drawing inspiration from business and entrepreneurial ecosystem models, this current adopts a functionalist, systemic, and prescriptive perspective. Authors such as Alijani et al. (2016), Audretsch et al. (2022), and Carayannis et al. (2021) conceptualize SIEs as "structures" or "environments" constituted by heuristic dimensions (political, institutional, and cultural) aimed primarily at providing support for social entrepreneurs. As seen in the keyword analysis, this discourse is rooted in management vocabulary, emphasizing efficiency, scalability, and financial sustainability. Social innovation is viewed through a neo-Schumpeterian lens (Andion et al., 2017), a "solution" to a social issue (Murray et al., 2010), while the role of the State and public policy remains largely peripheral.

(b) The Sociology of Practices Current

A second current is noted for its interdisciplinary, inter-institutional, and empirical studies, primarily across Europe (e.g., Domanski et al., 2020; Pel et al., 2020a). This current engages deeply with the social sciences, particularly sociology, to move beyond a product-oriented view.

Here, social innovation is not merely a "business output" but a result of changes in social practices. Consequently, ecosystems cannot be reduced to support structures. They represent a

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"distributed agency system" (Pel et al., 2020a), where local embedding, translocal connectivity, and discursive resonance are paramount. In the perspective of Domanski et al. (2020), the ecosystem functions as an ecology that stimulates and stabilizes new social configurations (e.g., new forms of labor or mobility). While providing robust epistemic shifts, this current focuses almost exclusively on the Global North, centering its debate on the climate crisis and socio-ecological transitions, with limited dialogue regarding the realities of the Global South.

(c) The Territorial-Pragmatist Current

The third current comprises works from the Global South, with a leading role played by Brazilian scholars such as Andion et al. (2020, 2022) and Santo and Andion (2024). As identified in the bibliometric data, Brazil leads global production in volume and relevance, spearheading new analytical pathways to explore social ecosystems marked by structural inequalities and historical injustices.

Unlike the North, where SIEs are often seen as strategies to modernize public governance to address challenges linked to socioecological transition, in Latin America, these "wicked problems" encounter old questions and public issues that remain unsolved. These are addressed within a constellation of "public arenas", stages for democratic experimentation, resistance, and resilience. Social innovation here is not just a tool for socio-ecological transition; it is a means to reclaim the "commons" and maintain "well-being" (bem-viver) within diverse modes of existence from a decolonial perspective. The notion of buen vivir/bem viver, rooted in Andean and Amerindian cosmologies, expresses alternatives to hegemonic development models centered on economic growth, emphasizing community, reciprocity, and cohabitation with nature (Acosta, 2016; Gudynas, 2011).

Anchored in the critique of the coloniality of power and knowledge (Quijano, 2014) and in the epistemological horizon of an ecology of knowledges (Santos, 2007), this current does not reject Northern theorization; rather, it insists that concepts travel with their contexts, and that mobilizing SIE frameworks in Latin America requires the critical assimilation that Guerreiro Ramos (1996) termed "sociological reduction", attentive to the historical, institutional, and epistemic legacies that constitute Southern realities. Brazilian scholarship has been building this bridge within social innovation research itself: through pragmatism and the public arenas approach (Andion et al., 2017; Magalhães et al., 2020), through counter-hegemonic horizons of development in rural contexts (Santo & Andion, 2024), and through the debate on the decolonial option in the field of Administration (Abdalla & Faria, 2017).

This brief analysis, summarized in Table 1, confirms that the SIE literature is characterized by an epistemological plurality. On one end, positivist and systemic approaches emphasize the functionality of theoretical models to forge high-impact SIEs. On the other, a counter-narrative rooted in the sociology of practices and pragmatism (Andion et al., 2020; Moulaert et al., 2013) views the ecosystem as a constellation of actors and their interactions with nature, capable of generating lasting transformative social innovations.

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This plurality should not be viewed as a weakness, but as a strength that reflects the complexity of the phenomenon. However, researchers must be conscious of these consequences: choosing a functionalist lens over a pragmatist one fundamentally changes the interpretation of what an ecosystem "is" and "does." Bridging the dialogue between these perspectives, particularly between the socio-ecological focus of the North and the democratic experimentation of the South, is one of the primary tasks for the future research agenda, as explored above.

It is in this context that the expression "ecologies of ecosystems", employed in this article, should be understood. The term refers neither to the biological meaning of ecology nor merely to the ecosystem metaphor consolidated in innovation studies; it deliberately dialogues with the "ecology of knowledges" proposed by Santos (2007). Just as no single episteme exhausts the possibilities of knowing, no single ecosystem model (functionalist, practice-based, or territorial) exhausts the diversity of concrete SIE configurations. Speaking of ecologies of ecosystems thus implies recognizing that SIEs are plural both in their epistemological foundations and in their territorial inscriptions, and that the relationships among these configurations and among the currents that study them should be of complementarity and mutual learning rather than hierarchy, in line with a decolonial horizon for the field.

Table 1. Emerging analytical currents in the SIE scientific debate

Feature	**Functionalist-Managerial Current**	**Sociology of Practices Current**	**Territorial-Pragmatist Current**
Primary Episteme	**Positivist / Systemic:** Seeks universal models, EIS efficiency, and scalability.	**Sociological / Interdisciplinary:** Focuses on social change and agency.	**Pragmatist / Critical:** Focuses on public inquiry and democratic experimentation.
View of the SIE	An **abstract structure** or "support environment" to be rationally managed.	An **ecology of practices** or a distributed system of agency.	A **constellation of public arenas** and territorialized social interactions and transactions
Role of Social Innovation	A **neo-Schumpeterian "product"** or solution to a specific social gap.	A **reconfiguration of social practices** (new ways of living/working).	A **process of collective investigation, co-definitions and co-creation** to face public problems and reclaim the commons and "well-being."

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Feature	Functionalist-Managerial Current	Sociology of Practices Current	Territorial-Pragmatist Current
Key Objectives	Financial sustainability, impact measurement, and business growth.	Stability and diffusion of new social configurations at the local level.	Resilience, social justice, and the transformation of power structures.
Geographical Focus	Global (but based on North Global business models).	**Global North** (notably Germany, Belgium, and Canada).	**Global South** (notably Brazil and Latin America).
Key Vocabularies	Business, helix, digital, social entrepreneurship, scalability.	Local embedding, discursive resonance, translocal connectivity.	Public arenas, democratic experimentation, territory, "commons", "well-being".
Theoretical Roots	Management Theory / Entrepreneurship Ecosystems.	Social Theory / Sociology of Innovation	Sociological Pragmatisms / Territorial and Urban Studies/ Public Action and Public Governance

Note. Developed by the authors.

Final considerations and contributions to the future research agenda

This study conducted a systematic literature review following the PRISMA protocol guidelines (Page et al., 2022) of the debate on SIEs between 2016 and 2025, offering a multi-dimensional mapping that integrates bibliometric trends with a critical qualitative and epistemological synthesis. By examining 267 articles and delving into a high-adherence subset of 19 studies, this work offers three primary contributions to the field.

First, the study identifies a significant geographical and citation paradox. While Brazil has emerged as a global leader in the volume of SIE research, demonstrating the vitality of the theme in the Global South, the citation impact exhibits a persistent concentration within European institutions and authors, revealing a geopolitical asymmetry in the field. This finding underscores the structural inequalities in global knowledge production and the need for greater international visibility for Southern perspectives. Read through an anti-abyssal lens (Santos, 2007), this asymmetry expresses a persistent cognitive injustice that conditions which conceptualizations circulate as universal knowledge and which remain marginalized as local experience (Abdalla & Faria, 2017).

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Second, the qualitative synthesis reveals that the SIE is no longer merely a support structure for individual entrepreneurs but is increasingly conceptualized as a territorialized constellation of actors and institutions. The shift from “innovation heroes” to “systemic interdependence” signals a maturation of the field, where ecosystems are seen as dynamic spaces for addressing “wicked problems” through collective action.

Third, the epistemological mapping presented provides a new lens to understand the field’s fragmentation. By categorizing the literature into Functionalist-Managerial, Sociology of Practices, and Territorial-Pragmatist currents, this study clarifies the ontological tensions that shape the debate. Rather than enforcing rigid boundaries, recognizing these distinct "epistemes" lays the foundation for an "ecology of ecosystems", in deliberate dialogue with Santos's (2007) ecology of knowledges, which assumes the plurality and incompleteness of each approach and advocates relationships of complementarity and mutual learning rather than hierarchy. Such mapping allows researchers to move beyond purely normative models and embrace the complexity of social innovation dynamics.

The results demonstrate that while the SIE debate is still in a stage of consolidation, it has gained significant traction as a response to the increasing complexity of contemporary social challenges. By shifting the analytical focus toward the internal relationships and practices of the ecosystem, this approach provides a deeper understanding of the collaborative dynamics required to address socio-environmental crises. Furthermore, the relevance of SIEs lies in their strategic alignment with the 2030 Agenda; they function as robust networks that catalyze innovation and systemic transformation. Through the articulation of collaborative practices, contextualized solutions, and the co-production of public policies, SIEs have emerged as essential instruments for the territorialized implementation of the SDGs.

This study advances the field by offering a critical systematization of the Social Innovation Ecosystem (SIE) literature, elucidating both its analytical potential and the significant epistemic, theoretical, and methodological gaps inherent in diverse approaches. By exploring this conceptual plurality, the research underscores the urgent need to enhance theoretical clarity and foster empirical investigations that reveal how these ecosystems function in practice across heterogeneous territorial and institutional contexts. Ultimately, this work serves as an invitation to the scientific community to invest in interdisciplinary and participatory research design approaches capable of capturing the complexity of SIEs and being sensitive to contextual realities. In doing so, we advocate for research agendas co-constructed in and from the Global South, genuinely committed to local alternatives and to the empowerment of affected communities (Abdalla & Faria, 2017).

Based on the gaps identified, we propose a research agenda focusing on five priority axes. First, to bridge the dialogue between the Global North and South, fostering comparative studies that account for divergent institutional landscapes, academic exchange, and collaborative learning among researchers and practitioners, without losing sight of the historical, institutional, and epistemological legacies that shape Global South realities (Guerreiro Ramos, 1996; Quijano, 2014). Second, to

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strengthen theoretical-empirical research through diverse analytical and epistemological lenses, emphasizing engaged scholarship that operates as an "ecology of knowledges" (Santos, 2007), learning reciprocally from non-academic and subalternized practices without epistemic hierarchies, thereby contributing to the robustness of SIEs and social innovation experiences. Third, to encourage theorization derived from empirical investigations that account for the diversity, plasticity, and context-specific ecologies of SIEs, viewing them not as static templates but as spaces for democratic experimentation (Andion et al., 2020). Fourth, to broaden interdisciplinary and interinstitutional dialogue to address contemporary wicked problems and sustainability challenges, thereby reinforcing the social innovation research agenda both in Brazil and internationally. Lastly, to explore transversal themes already emerging in the field, such as the relationship between SIEs and public governance, urban management, territorial dynamics, and the digital interface, focusing on their role in social transformation and the promotion of social justice.

Finally, this systematic review has limitations inherent to this type of research, such as the selection of databases and search terms. Although the English-language metadata required by the databases ensured the retrieval of Spanish-language articles indexed therein, relevant Latin American production published in journals indexed only in regional databases (e.g., SciELO, Redalyc, Latindex) remains outside the corpus. This structural limitation is not merely operational: it acts as an epistemic abyssal line that renders regional, non-hegemonic production invisible (Santos, 2007), expressing the academic dependency that governs global knowledge production (Abdalla & Faria, 2017). Consequently, future studies that expand the scope of the bibliometric corpus of analysis are suggested, including searches in regional databases and the inclusion of Spanish descriptors (e.g., “ecosistema de innovación social”). It is recommended that a new review include related terms; however, this demands high theoretical proficiency to exercise what Guerreiro Ramos (1996) defined as “sociological reduction”: an active, critical-assimilative stance necessary to distinguish subtle epistemological nuances and maintain construct validity.

Declaração de conflito de interesse

Os autores declaram que não há conflito de interesse.

Declaração de contribuição dos autores

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Declaração de disponibilidade de dados da pesquisa

O conjunto de dados de apoio aos resultados deste estudo não está disponível ao público.

Declaração de uso de IA

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References

Abdalla, M. M., & Faria, A. (2017). Em defesa da opção decolonial em administração/gestão. *Cadernos EBAPE.BR*, 15(4), 914–929. https://doi.org/10.1590/1679-395155249

Acosta, A. (2016). *O bem viver: Uma oportunidade para imaginar outros mundos*. Autonomia Literária; Editora Elefante.

Alijani, S., Luna, A., Castro-Spila, J., & Unceta, A. (2016). Building Capabilities through Social Innovation: Implications for the Economy and Society. *Finance and Economy for Society: Integrating Sustainability*, *11*. https://doi.org/10.1108/s2043-905920160000011016

Alperstedt, G. D., & Andion, C. (2021). Social Innovation Ecosystems: A Literature Review and Insights for a Research Agenda. In J. Howaldt, C. Kaletka and A. Schröder, (Eds.), *A Research Agenda for Social Innovation*, Cheltenham: Edward Elgar Publishing.

Alperstedt, G. D., Andion, C., & Pires, P. K. (2023). Dos empreendimentos sociais aos negócios de impacto: Examinando o debate teórico rumo à inovação social. *REGEPE Entrepreneurship and Small Business Journal*, *12*(2), e2264. https://doi.org/10.14211/ regepe.esbj.e2264

Andion, C., Alperstedt, G. D., & Graeff, J. F. (2020). Ecossistema de inovação social, sustentabilidade e experimentação democrática: um estudo em Florianópolis. *Revista de Administração Pública*, *54*(1), 181–200. https://doi.org/10.1590/0034-761220180418

Andion, C., Alperstedt, G. D., Graeff, J. F., & Ronconi, L. (2022). Social innovation ecosystems and sustainability in cities: a study in Florianópolis, Brazil. *Environment, Development and Sustainability*. https://doi.org/10.1007/s10668-021-01496-9

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/SciELOPreprints.18727

Andion, C., & Chimenti, P. (2024). Contribuições da Administração para Pensar e agir sobre as cidades. *Revista de Administração Contemporânea*, *28*(3), e240164. https://doi.org/10.1590/1982-7849rac2024240164.por

Andion, C., Ronconi, L., Moraes, R. L., Gonsalves, A. K. R., & Serafim, L. B. D. (2017). Sociedade civil e inovação social na esfera pública: uma perspectiva pragmatista. *Revista De Administração Pública*, *51*(3), 369–387.

Aria, M. (2021). *Bibliometrix: Data Importing and Converting*. Www.bibliometrix.org. https://www.bibliometrix.org/vignettes/Data-Importing-and-Converting.html

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive Science mapping analysis. *Journal of Informetrics*, *11*(4), 959–975. https://doi.org/10.1016/j.joi.2017.08.007

Audretsch, D. B., Eichler, G. M., & Schwarz, E. J. (2022). Emerging needs of social innovators and social innovation ecosystems. *International Entrepreneurship and Management Journal*, *18*, 217-254. https://doi.org/10.1007/s11365-021-00789-9

Biggeri, M., Testi, E., & Bellucci, M. (2017). Enabling Ecosystems for Social Enterprises and Social Innovation: A Capability Approach Perspective. *Journal of Human Development and Capabilities*, *18*(2), 299–306. https://doi.org/10.1080/19452829.2017.1306690

Bucio-Mendoza, S., & Solis-Navarrete, J. A. (2025). Social Innovation Ecosystems in Times of Crisis: Rethinking Innovation Policy Through the COVID-19 Pandemic. *Sustainability*, *17*(21), 9502. https://doi.org/10.3390/su17219502

Cajaiba-Santana, G. (2014). Social innovation: Moving the field forward. A conceptual framework. *Technological Forecasting and Social Change*, *82*, 42–51. https://doi.org/10.1016/j.techfore.2013.05.008

Canseco-Lopez, F., Serra, A., & Camps, M. M. (2025). Opening Our Innovation Ecosystems to All: The INTEGER Project Case Study. *Sustainability*, *17*(3), 1164–1164. https://doi.org/10.3390/su17031164

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), 1–14. https://doi.org/10.1109/tem.2019.2914408

Catala, B., Savall T., & Chaves-Avila, R. (2023). From entrepreneurial and innovation ecosystems to the social economy ecosystem. *Journal of Business Research*. https://doi.org/10.1016/j.jbusres.2023.113932

Cefaï, D. (2017). Públicos, problemas públicos, arenas públicas. *Novos Estudos – CEBRAP*, *36*(1), 187–214. https://doi.org/10.25091/s0101-3300201700010009

Chimenti, P. (2025). Muito além da bibliometria: O valor das revisões de literatura na pesquisa em Administração. *Revista de Administração Contemporânea*, *29*(3), e250209. https://doi.org/10.1590/1982-7849rac2025250209.por

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/SciELOPreprints.18727

Cortese, D., Civera, C., Casalegno, C., & Zardini, A. (2024). Transformative social innovation in developing and emerging ecosystems: a configurational examination. *Review of Managerial Science*, *18*, 827-857. https://doi.org/10.1007/s11846-023-00624-1

Cosimato, S., Di Paola, N., & Vona, R. (2024) Digital social innovation: how healthcare ecosystems face Covid-19 challenges. *Technology Analysis &Strategic Management*, *36*(8), 1763-1778. https://doi.org/10.1080/09537325.2022.2111117

Cunha, J., Ferreira, C., Araújo, M., Nunes, M. L., & Ferreira, P. (2022). Social innovation projects link to sustainable development goals: case of Portugal. *International Journal of Sustainable Development & World Ecology*, *29*(8), 725–737. https://doi.org/10.1080/13504509.2022.2084795

Dantas, C., Louceiro, J., Vieira, J., van Staalduinen, W., Zanutto, O., & Mackiewicz, K. (2023). SHAFE Mapping on Social Innovation Ecosystems. *International Journal of Environmental Research and Public Health*, *20*, 118. https://doi.org/10.3390/ijerph20010118

Domanski, D., Howaldt, J., & Kaletka, C. (2020). A comprehensive concept of social innovation and its implications for the local context – on the growing importance of social innovation ecosystems and infrastructures. *European Planning Studies*, *28*(3), 454–474. https://doi.org/10.1080/09654313.2019.1639397

Elsevier. (2025). *Scopus content policy and selection*. https://www.elsevier.com/products/scopus/content/content-policy-and-selection

Ergene, S., Banerjee, S, B., Hoffman, A. (2021) (Un)Sustainability and Organization Studies: Towards a Radical Engagement. *Organization Studies*, *42*(8), 1319–1335.

Ezponda, J. E., & Malillos, L. M. (2011). Cambio de paradigma en los estudios de innovación: el giro social de las políticas europeas de innovación. *Arbor*, *187*(752), 1031–1043. https://doi.org/10.3989/arbor.2011.752n6002

Gudynas, E. (2011). Buen Vivir: Today's tomorrow. *Development*, *54*(4), 441–447. https://doi.org/10.1057/dev.2011.86

Guerreiro Ramos, A. (1996). *A redução sociológica* (3.ª ed.). Editora UFRJ.

Gupta, J. , Bai, X., Liverman, D. M., Rockström, J., Qin, D., Stewart-Koster, B., Rocha, J. C., Jacobson, L., Abrams, J. F., Andersen, L. S., Armstrong McKay, D. I., Bala, G., Bunn, S. E., Ciobanu, D., DeClerck, F., Ebi, K. L., Gifford, L., Gordon, C., Hasan, S., … Gentile, G. (2024). A just world on a safe planet: a Lancet Planetary Health–Earth Commission report on Earth-system boundaries, translations, and transformations. *The Lancet Planetary Health*, *8*(10), e813 - e873.

Kadyrova, A. (2024). Exploring Structures of Urban Social Innovation Ecosystems: Cases of Manchester, Utrecht, Stockholm, Sofia and Budapest. *Journal of Social Entrepreneurship*, *15*(1), 1–23. https://doi.org/10.1080/19420676.2021.1921013

Kaletka, C.; Markmann, M. & Pelka, B. (2016) Peeling the Onion. An Exploration of the Layers of Social Innovation Ecosystems. Modelling a context sensitive perspective on driving and

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/SciELOPreprints.18727

hindering factors for social innovation. *European Public Social & Social Innovation Review*. 1(2), 83-93.

Kantabutra, S. (2024). Toward a Sustainability Performance Management framework. *Heliyon*, *10*(13), e33729–e33729. https://doi.org/10.1016/j.heliyon.2024.e33729

Krüger, D., & David, A. (2020). Entrepreneurial Education for Persons With Disabilities—A Social Innovation Approach for Inclusive Ecosystems. *Frontiers in Education*, *5*(3). https://doi.org/10.3389/feduc.2020.00003

Latour, B. (2012). *Reagregando o social: uma introdução à teoria do Ator-Rede*. EDUFBA; EDUSC.

Lavalle, A. G., & Szwako, J. (2015). Sociedade civil, Estado e autonomia: argumentos, contra-argumentos e avanços no debate. *Opinião Pública*, *21*(1), 157–187. https://doi.org/10.1590/1807-0191211157

Magalhães, T., Andion, C., & Alperstedt, G. D. (2020). Laboratórios vivos de inovação social e ação pública: Um enfoque analítico e um caminho metodológico baseados no pragmatismo. *Cadernos EBAPE.BR*, *18*(spe), 680–696. https://doi.org/10.1590/1679-395120190159

Monteiro, A. (2019). O que é a Inovação Social? Maleabilidade Conceitual e Implicações Práticas. *Dados*, *62*(3). https://doi.org/10.1590/001152582019187

Moulaert, F. (2009). Social innovation: Institutionally embedded, territorially (re)produced. In D. MacCallum, F. Moulaert, J. Hillier, & S. Vicari Haddock (Eds.), *Social Innovation and Territorial Development* (pp. 11–23). Ashgate.

Moulaert, F., Hamdouch, A., MacCallum, D., & Mehmood, A. (2013). *The International Handbook on Social Innovation*. https://doi.org/10.4337/9781849809993

Muller, P., Szostak, B. L. & Andion, C. (2024). Word from the Guest Editors: Producing social innovations in the creative and digital age. *Management international / International Management / Gestiòn Internacional*, *28*(4), 5–5. https://doi.org/10.59876/a-bej1-gwam

Murray, R., Caulier-Grice, J., & Mulgan, G. (2010). *The open book of social innovation*. NESTA; The Young Foundation.

Nepomuceno, A. S. N., Alperstedt, G. D., & Andion, C. (2023). Ecossistema de inovação social e preservação da mata atlântica no sul do brasil: o caso araucária +. *RGO - Revista Gestão Organizacional*, *16*(3), 98-120. http://dx.doi.org/10.22277/rgo.v16i3.7392.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., & McGuinness, L. A. (2022). A declaração PRISMA 2020: diretriz atualizada para relatar revisões sistemáticas. *Epidemiologia e Serviços de Saúde*, *31*(2). https://doi.org/10.5123/s1679-49742022000200033

Pel, B., Wittmayer, J., Dorland, J., & Jorgensen, M. S. (2018). Unpacking the social innovation ecosystem: A typology of empowering network constellations. *Annals of 10th International*

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/SciELOPreprints.18727

Social Innovation Research Conference (ISIRC). International Social Innovation Research Conference (ISIRC), Heidelberg.

Pel, B., Wittmayer, J., Dorland, J., & Jørgensen, M. S. (2020a). Unpacking the social innovation ecosystem: an empirically grounded typology of empowering network constellations, Innovation. *The European Journal of Social Science Research*, *33*, 311-336. https://doi.org/10.1080/13511610.2019.1705147

Pel, B., Haxeltine, A., Avelino, F., Dumitru, A., Kemp, R., Bauler, T., Kunze, I., Dorland, J., Wittmayer, J., & Jørgensen, M. S. (2020b). Towards a theory of transformative social innovation: A relational framework and 12 propositions. *Research Policy*, *49*(8), 104080. https://doi.org/10.1016/j.respol.2020.104080

Perikangas, S., Kostilainen, H., & Kainulainen, S. (2024). Co-production of social innovations and enabling ecosystems for social enterprises. *International Journal of Public Sector Management, 37*(3), 351-369. https://doi.org/10.1108/IJPSM-04-2023-0111

Pinto, H., Ferreira, S., & Guerreiro, J. A. (2021). The emergence of a Social Innovation Ecosystem in Portugal: An exploratory approach based on the perspective of strategic stakeholders. *European Public & Social Innovation Review*, *6*(2), 15-34.

Quijano, A. (2014). Colonialidad del poder, eurocentrismo y América Latina. In D. A. Clímaco (Ed.), *Cuestiones y horizontes: De la dependencia histórico-estructural a la colonialidad/descolonialidad del poder* (pp. 778–832). CLACSO.

Rangelov, I., & Theros, M. (2023). Civic ecosystems and social innovation: From collaboration to complementarity. *Global Policy*, *14*(5), 797–804. https://doi.org/10.1111/1758-5899.13248

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, *4*(2), 155-169.

Santo, A. L. do E., & Andion, C. (2024). Rural Social Innovation: An Exploratory Study in Rural Brazil. *Revista Organizações & Sociedade*, *31*(110), 001-036. https://doi.org/10.1590/1984-92302024v31n0014EN

Santos, B. de S. (2007). Para além do pensamento abissal: Das linhas globais a uma ecologia de saberes. *Novos Estudos CEBRAP*, (79), 71–94. https://doi.org/10.1590/S0101-33002007000300004

Silva, R. L. M. da, Segatto, A. P., Carvalho, A. C. V., & Ribeiro, G. (2020). Ecossistema de inovação social e os níveis de intensidade das parcerias intersetoriais do empreendedor social. *REGEPE Entrepreneurship and Small Business Journal*, *9*(4), 617-640. DOI: https://doi.org/10.14211/regepe.v9i4.1769

Slimane, K. B., & Lamine, W. (2017). A transaction-based approach to social innovation. *The International Journal of Entrepreneurship and Innovation*, *18*(4), 231-242. https://doi.org/10.1177/1465750317741879

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/SciELOPreprints.18727

Terstriep, J., Rehfeld, D., & Kleverbeck, M. (2020). Favourable social innovation ecosystem(s)? – An explorative approach. *European Planning Studies*, *28*(5), 881–905. https://doi.org/10.1080/09654313.2019.1708868

Unceta, A., Luna, A., Castro, J., & Wintjes, R. (2020). Social Innovation Regime: an integrated approach to measure social innovation. *European Planning Studies*. https://doi.org/10.1080/09654313.2019.1578338

United Nations. (2015). *Resolution 70/1. Transforming our world: the 2030 Agenda for Sustainable Development*. Un.org. https://docs.un.org/en/A/RES/70/1

United Nations. (2025). *The 17 Sustainable Development Goals*. United Nations. https://sdgs.un.org/goals

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