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Beyond Paradoxical Sustainable Business Model and Ecosystem Innovation: Cosmo-Local Dynamics From Brazilian–Belgian Perspectives

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Abstract

Socio-ecological challenges highlight structural problems in incorporating sustainability into organizations and governments, requiring strategic directions and actions of collective value. This situation has resulted in the emergence of concepts related to eco-innovation and more specifically sustainable business model innovations (SBMI). On the one hand, this phenomenon represents a major internal–external approach for incorporating sustainability aspects in society. On the other hand, considering the inherent risks of socio-ecological challenges, some key players worldwide are developing initiatives focusing on the contribution of the societal context to the business in an external–internal approach. Therefore, this research aims to propose an interactive meta-model of micro-foundations in SBMI and to detail the dynamics of territory and ecosystems that combine the internal–external and external–internal approaches. Utilizing a qualitative methodology, the analysis considers interviews of 22 experts directly engaged in leading sustainable transitions in two territories: Rio de Janeiro, Brazil, and Wallonia, Belgium. These two territories were selected due to the heterogeneity of their contexts and sustainable transitions, with the aim of exploring divergent perspectives and the paradoxes between real systems and territories. The results are structured in 75 first-order and 16 second-order codes, and five aggregated dimensions. The conceptual model (Meta-MEI) and dynamic framework developed from these codes reflect a cosmo-local approach, providing indications on how the internal–external and external–internal approaches are interconnected, as well as highlighting the source's leadership and inter-territorial stakeholders in incorporating sustainability from a holistic perspective. Future research should explore the meta-model validation in different territories.

Keywords: *Eco-innovation; Sustainability; Leadership; Resilience; Strategic management*

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Companies are increasingly confronted with the dual challenge of maintaining operational performance while embedding sustainability imperatives into their core activities. These imperatives include contributing to the prosperity of local territories, mitigating the disruptive impacts of disasters, and fostering legitimate, long-term relationships with stakeholders (Costa & Xavier, 2023; Xavier et al., 2024). Concurrently, both governmental institutions and civil society are under mounting pressure to embed sustainability considerations into everyday practices (Richardson et al., 2023). In this context, innovation is being redefined through the emergence

of eco-innovation, which refers to transformative changes in techniques, processes, products, and business models that result in reduced environmental impacts (De Jesus & Mendonça, 2018; Xavier et al., 2020). As highlighted by Muñoz-Torres et al. (2019), given the magnitude of socio-ecological challenges, the only viable solution appears to be the widespread adoption of sustainable business models. Organizations must systematically, holistically, and radically address emerging economic and environmental challenges (Astorino, 2024) by reconfiguring business models through eco-innovation approaches (Boons & Lüdeke-Freund, 2013). Eco-innovation

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can be understood either as the outcome of a process or as the process itself that leads to this outcome (Hazarika & Zhang, 2019). For instance, in the context of eco-innovation in business model, it can refer to the outcome – a sustainable business model – or the process through which this outcome is achieved – a sustainable business model innovation (SBMI). This quest in embedding socio-ecological factors into business model innovation processes is referred to SBMI (Bocken & Geradts, 2020), which will be the main focus of this manuscript. SBMI involves innovations that create positive environmental or societal impacts by transforming how businesses deliver and capture value, offering higher returns and resilience compared to traditional models (Bocken et al., 2014; Shakeel et al., 2020).

As emphasized by Bansal and Desjardine (2014), firms operate as systems embedded within broader macro-systems. In this view, business models serve as the structural foundation of business ecosystems – networks of interdependent actors whose mutual success and survival rely on ongoing collaboration and coordination (Ansari et al., 2016; Iansiti & Levien, 2004; Moore, 1996). The concept of a business ecosystem can be understood through two complementary lenses (Adner, 2017; Jacobides et al., 2018). An internal–external perspective focuses on how firms develop outward-looking strategies in response to changing environments, emphasizing organizational adaptation and transformation. Conversely, an external–internal perspective highlights how territorial dynamics and the creation of cooperation ecosystems contribute to shaping and nurturing business model innovation. Despite the fact that environmental changes are associated with the emergence of eco-innovation and the subsequent SBMI concept, the focus is on organizational perspectives from an internal–external approach. However, recent global challenges (e.g., covid-19, wars, resource scarcity, social inequalities) have led researchers (Costa & Xavier, 2023; Xavier et al., 2024) to argue for broadening the eco-innovation concept toward an external–internal approach, influencing the definition of SBMI by integrating territorial innovation opportunities. This shift is already visible, though fragmented, in practices such as collaborative food governance, community waste management (Xavier et al., 2024), or refugee crisis responses (Da Silva Leite et al., 2023) in Brazil, and inclusive biodiversity (Dendoncker et al., 2018) or regional (Nicola, 2024) transition initiatives in Belgium.

Despite growing interest in SBMI, several theoretical gaps persist in the literature. First, the distinction between internal and external approaches to SBMI remains insufficiently defined, and the potential synergies of combining both perspectives are largely unexplored (Dentchev et al., 2018; Geissdoerfer et al., 2018). Second, although the concepts of *territory* (e.g., Fontinha et al., 2022; Maillefert & Robert, 2017; Xavier et al., 2024) and *ecosystem* (e.g., Gomes et al., 2023; Konietzko et al.,

2020; Oskam et al., 2021) are increasingly mobilized in sustainability research, their theoretical articulation within SBMI studies remains underdeveloped. Third, existing research is characterized by a fragmented landscape of models, often focused on isolated variables (Xavier et al., 2020). There is a lack of comprehensive meta-models or meta-analyses capable of synthesizing existing knowledge and providing a unified view of SBMI across scales and contexts. Addressing these gaps, this research proposes a conceptual metamodel that bridges internal and external interactions in SBMI, while positioning territory and ecosystems as key structuring environments for sustainable business model transformation.

This context leads to the following research questions:

RQ1. In what ways can internal organizational processes and external strategic engagements serve as micro-foundations of SBMI?

RQ2. In what ways can territorial dynamics and ecosystem-based interactions constitute micro-foundations of SBMI?

RQ3. How can existing fragmented models of SBMI be synthesized into a comprehensive framework that captures cross-scale and contextual dynamics?

By better understanding the internal–external dynamics on one hand (RQ1), and the external–internal dynamics on the other hand (RQ2), the research aims to propose a comprehensive framework that captures both cross-scale and contextual dynamics (RQ3). Therefore, the resulting meta-model derives from the study of micro-foundations of SBMI. Micro-foundations are the underlying actions on individual and group levels that shape strategies as well as dynamic capabilities, leading to the emergence of macro dynamics in organizations and ecosystems (Teece, 2007; Teece et al., 1997). Considering the current situation where some key organizations are in the vanguard of this movement, this research adopts a meta-analysis methodology focused on capturing the perspective of experts with a holistic understanding of eco-innovation dynamics. In this sense, we consider experts from two territories with significant concerns regarding sustainability: Rio de Janeiro, Brazil, and Wallonia, Belgium.

This research comprehensively explains the sustainability paradoxes and opportunities across different socio-economic and environmental landscapes. Rio de Janeiro is a densely populated city in Brazil with enormous sustainability challenges. While dealing with urban pollution, deforestation, and social inequality (Malta & da Costa, 2021), the city of Rio recognizes and values the local knowledge of an informal service economy (Cipolla et al., 2017). Wallonia, a region at the heart of the European Union, represents a developed context where sustainability concerns are also pressing, particularly regarding climate change, waste management, and energy consumption (Bruyninckx et al., 2012). Studying initiatives in both territories can provide valuable insights into effective governance, public engagement, and eco-innovation dynamics that can be adapted

and applied to other contexts besides these two territories. Moreover, the insights gathered can serve as a basis for global sustainability strategies, fostering collaboration and knowledge exchange between the Global North and Global South.

This research is structured in four sections. After this introduction, the second section presents the theoretical background on the internal–external and external–internal approaches intrinsic to SBMI. The third section explains the methodological procedures adopted in this research. The fourth section provides structured results in terms of coding the experts' interviews and a conceptualization of the findings. The fifth section then presents the final considerations and future research suggestions.

Theoretical background

Recognizing the broader context in which innovations emerge is essential, particularly the intricate dynamics between diverse stakeholders, resources, and institutions that together form environmentally and socially responsible business networks. These interconnected systems – where companies, suppliers, consumers, regulators, and other actors collaboratively contribute to long-term economic viability, environmental stewardship, and social equity – play a critical role in shaping how eco-innovations are developed and adopted (Stasiškienė et al., 2021; Verdier, 2008). For this reason, the concept of SBMI is intrinsically related to that of business ecosystem. SBMI drives sustainability transitions within business ecosystems by fostering collaboration and innovation among multiple partners. It emphasizes value creation beyond traditional supply chains and blends closed and open innovation strategies to achieve strong sustainability outcomes (Bolton & Hannon, 2016; Ritala et al., 2023). In this sense, a sustainable business model is seen as a catalyst for the transition to sustainability across business ecosystems (Bolton & Hannon, 2016; Boons & Lüdeke-Freund, 2013; Lüdeke-Freund, 2010), while business ecosystem fosters the development of sustainable business models (Evans et al., 2017; Schaltegger et al., 2016). Hou and Shi (2021) state that a firm's continuous innovation should be approached by considering both parts of a firm's business ecosystem. This section provides the theoretical background concerning SBMI-related micro-foundations in an internal–external approach and in an external–internal approach, corresponding to the two constituent parts of the business ecosystem.

SBMI-related micro-foundations: Internal–external approach

Following Adner (2017) and Jacobides et al. (2018), the business ecosystem may be divided into two parts. The first part refers to all the organization's 'external' activities and strategies,

which represent the internal–external approach. External activities such as open innovation (Pichlak & Szromek, 2021), stakeholder management (Fobbe & Hilletoft, 2021), or sustainable marketing (Amir & Prabawani, 2023) will be key for the success of SBMI. This approach refers to a macro view of the business ecosystem, characterized by a large number of loosely connected actors who depend on each other for their mutual effectiveness (e.g., Autio & Thomas, 2014; Jacobides & Tae, 2015; Rong & Shi, 2014). The focus is on actors with direct ties to the focal organization and can therefore involve a broad scope of actors (Teece, 2007). Accordingly, the business ecosystem raises new challenges in terms of leadership (Foss et al., 2023), organizational design (Ganco et al., 2020), and external strategies (Adner, 2017) that are addressed in this manuscript.

Leadership is central to fostering eco-innovation and sustainability within organizations, highlighting transformational and visionary leadership styles as essential for engaging employees emotionally and intellectually. This approach encourages positive change through shared vision and inspiration, positioning leadership as a fundamental factor in driving sustainability (Amir & Prabawani, 2023; Sabella et al., 2016). Furthermore, the necessity for these leadership styles extends to the business ecosystem level, where leaders must connect with stakeholders to accomplish societal goals (Averina et al., 2022; Konietzko et al., 2020). In this sense, Kurucz et al. (2017) introduce relational leadership capabilities, which view leadership as a dynamic process shaped by interactions within organizations, emphasizing the integration of sustainability into business practices. Some important aspects of leadership involve the opportunity to adopt reflective practices (Sehnm et al., 2019) and disruptive thinking (Kasmi et al., 2022; Khan et al., 2020).

Additionally, there are distinct dynamic capabilities crucial for strategic sustainability (sensing, seizing, and reconfiguration), a set of strategic activities aimed at enabling companies to integrate, build, and reconfigure internal and external resources to address rapidly changing business environments (Teece et al., 1997). The lack of dynamic capabilities could explain the timidity of eco-innovation strategies. Indeed, dynamic capabilities are often used to illustrate SBMI (e.g., Hofmann & Zu Knyphausen-Aufseß, 2022; Inigo et al., 2017; Oliveira-Dias et al., 2022) and the role of business ecosystem in such a process (e.g., Fait et al., 2024; Konietzko et al., 2020; Santa-Maria et al., 2022). Furthermore, Teece (2007) discusses micro-foundations as a concept for understanding the micro-level constructs that facilitate the development of dynamic capabilities. Put differently, micro-foundations reflect the individual-level and group activities that not only contribute to the development of dynamic capabilities but also impact the overall strategy of an organization (Fallon-Byrne & Harney, 2017). Therefore, micro-foundations of dynamic capabilities comprise all the processes, procedures, structures, organizational activities or skills

underlying each capability and influencing its sensing, seizing, and reconfiguring capacities. The packages of micro-foundations for dynamic capabilities can trace an organization's innovation trajectory (Teece, 2007).

First, to sense sustainable opportunities, organizations must possess in-depth knowledge of their environment and foster a holistic and long-term perspective that recognizes the interconnections among activities (Astorino, 2024; Xavier et al., 2020). Additionally, organizations should implement collaborative monitoring with both internal and external stakeholders to enhance situational awareness, while reflective practices around pressures and expectations further promote organizational ambidexterity, allowing the simultaneous pursuit of innovation and routine operations (Costa & Xavier, 2023; O'Reilly & Tushman, 2008). Considering the internal stakeholders, it is also fundamental to consider how organizational culture interferes in the engagement of the staff in sustainable strategies (Hofmann & Zu Knyphausen-Aufseß, 2022; Ringvold et al., 2023).

Second, to seize dynamic capability of sustainable opportunities, leaders must create and adopt a common language around sustainability, utilizing accepted frameworks to facilitate collaboration and synergies within the organization (Madsen, 2020; Ringvold et al., 2023; Santa-Maria et al., 2022) and with the external stakeholder (Fontainha et al., 2022; Madsen, 2020; Ringvold et al., 2023; Santa-Maria et al., 2022). The perception of success should be aligned with sustainability criteria, emphasizing that financial profit is a means to fulfil the company's mission rather than an end goal (Stubbs, 2019; Tabares, 2021). Operating principles should consider the entire life cycle of products, utilizing eco-design tools systematically and promoting internal collaboration for effective eco-innovation (Kristensen et al., 2021; Tabares, 2021).

Third, the reconfiguration capability deals with the adaptation of human resources and innovation teams to foster a sustainable organizational culture (Santa-Maria et al., 2022; Sehnem et al., 2019; Troise et al., 2023). The discussion highlights the fact that the eco-innovation process is complex and sequential, requiring organizations to develop these capabilities at specific stages to effectively transform opportunities into tangible innovations, ultimately strengthening performance across sustainability dimensions (Throop & Mayberry, 2017; Zucchella & Previtali, 2019). Additionally, for sustainable development, many organizations commit to long-term relations along the value chain, resulting in the co-development of strategies (Amir & Prabawani, 2023; Khan et al., 2020; Lippolis et al., 2023). Operationalization of collaborative activities is linked to the external reconfiguration capability. It involves co-production with stakeholders, shifting focus from 'doing the right things for them' to 'doing the right things with them' (Oliveira-Diaz et al., 2022; Santa-Maria et al., 2022; Sehnem et al., 2019). Experimentation, joint learning, and training are organized

across the value chain (Oliveira-Diaz et al., 2022; Sinatoko Djibo et al., 2023; Van Eechoud & Ganzaroli, 2023).

Leadership, organizational design, and external strategies together constitute micro-foundations of SBMI. However, the academic literature tends to examine these internal and external approaches in isolation. This separation hinders a comprehensive understanding of how these dimensions interact and reinforce one another.

Problem statement I (PSI): There is a critical need for integrative frameworks that account for the mutual influence of intra-organizational processes and external strategies in shaping SBMI.

SBMI-related micro-foundations: External-internal approach

Companies generally focus on creating value for their supply chains, but this value creation must meet the expectations of stakeholders and incorporate the characteristics of the territory and its endogenous resources (Salvado & Joukes, 2021). Territory emerges as a dynamic and multifunctional system interacting with social, cultural, and economic elements, influencing local efficiency (Fontainha et al., 2022; Tapia et al., 2021; Xavier et al., 2024) positioning territory as central to the creation of relational and experiential value (Maillefert & Robert, 2017).

Companies face constant disruption in their supply chains, requiring them to engage and collaborate with various stakeholders, including public and private stakeholders and citizens (Cardoso et al., 2024; Fontainha et al., 2017, 2022). Sustainable solutions and economic models have been proposed as an alternative to improve the relationship between companies and territories, emphasizing the human and societal dimension, with renewed relationships between local actors (Costa & Xavier, 2023; Xavier et al., 2024). Therefore, a sustainable ecosystem could be territorially anchored, addressing local issues, and serving specific communities (Amir & Prabawani, 2023; Dentoni et al., 2021). To strengthen its role, the ecosystem focuses on enhancing its collaboration with local authorities and fostering ongoing interactions for sharing information about customers and best practices in socio-ecological transitions. This joint learning leverages collective experiences and promotes a culture of trial and error, enabling systematic experimentation and innovation over time (Best et al., 2022; Ferrari et al., 2023; Lippolis et al., 2023; Madsen, 2020; Velter et al., 2020).

Such an ecosystem enters in the second part of the business ecosystem, the micro view. Indeed, this view requires the creation of at least one particular 'ecosystem' representing an 'alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize' (Adner, 2017, p. 40). In this configuration, ecosystems

are clearly distinguishable from other types of inter-organizational collaborations in the sense that their particular emphasis is on the value proposition itself – the value proposition creates the boundaries of the ecosystem concerned. Value proposition can be material (e.g., a new product) as well as immaterial (e.g., sharing specific knowledge) (Järvi et al., 2018), and may not be explicit, without compromising the achievement of a collective outcome (Jacobides et al., 2018). In this configuration, every individual ecosystem actor will enter an ecosystem with expectations at the outset (Gueler & Schneider, 2021). Therefore, ecosystems are characterized by an alignment structure, multilateral relationships between partners, expectations, and an explicit or tacit value proposition. Multiple ecosystems may coexist within an organization's broader business ecosystem, potentially taking diverse forms such as knowledge ecosystems (e.g., Clarysse et al., 2014), innovation ecosystems (e.g., Oskam et al., 2021), or territorial ecosystems (e.g., Maillfert & Robert, 2017).

Unlike technological or industrial innovation ecosystems, territorial ecosystems encompass economic, social, and environmental interactions. According to Ritala et al. (2018), capitalized companies adopt predominantly environmentally oriented archetypes, while social and organizational archetypes are incorporated to a lesser extent. Regarding social aspects, these archetypes can involve the active participation of local communities in the development of innovations (Moulaert & Ailenei, 2005; Pamplona et al., 2024), as well as including natural resources, knowledge networks, and governance structures that promote sustainable value (Levänen et al., 2022; Pamplona et al., 2024; Velter et al., 2020; Verleye et al., 2024).

According to Stasiškienė et al. (2021) and Winn and Pogutz (2013), territorial ecosystems offer a favourable environment for the development of eco-innovations, as they combine the physical, social, and institutional resources available within a locality. These ecosystems allow organizations to create value locally and adapt their business models to the specific characteristics and needs of the territories. Integrating eco-innovations into territorial ecosystems requires a holistic approach, where factors such as infrastructure, local culture, governance, and social capital play key roles (Bonfanti et al., 2016; Kasparian & Rebón, 2020).

In this territorial perspective, a shared vision is crucial, requiring an understanding of individual interests to align objectives. This co-constructive dimension includes creating value and collaboration among ecosystem partners (Dentoni et al., 2021; Ferrari et al., 2023; Gomes et al., 2023; Konietzko et al., 2020; Velter et al., 2020; Verleye et al., 2024; Zucchella & Previtali, 2019). Actors engage in resource-sharing activities and strive for collective resilience based on local capabilities (Dentoni et al., 2021; Ferrari et al., 2023; Verleye et al., 2024). They employ strategies such as participation and socialization to foster customer commitment and ensure equitable value

distribution among participants (Averina et al., 2022; Izuka & Hane, 2021; Konietzko et al., 2020). Therefore, cooperation between governments, companies, and local communities is fundamental to the success of eco-innovations (Carneiro et al., 2023; Montshiwa, 2018). This phenomenon can be analysed in light of the instrumental approach of stakeholder theory, which suggests that collaborative relationships are crucial for creating sustainable value (Fontainha et al., 2022; Friedman & Miles, 2006). This mutually beneficial interaction facilitates the sharing of resources and knowledge, boosting innovation and responsiveness to disruptions (Costa & Xavier, 2023; Freeman et al., 2020; Hörisch et al., 2014), resulting in more robust ecosystems. The resilience of these ecosystems is further strengthened by cooperation networks that connect local and global actors (Harris et al., 2017), allowing sustainable business models to continuously adapt to external and internal pressures, such as changes in market conditions, social and environmental crises, and the implementation of eco-innovations (Cardoso et al., 2024; Nikolova-Alexieva et al., 2022).

Whereas supply chains tend to focus more on value delivery and material and information flows (Braz & de Mello, 2022), ecosystems primarily focus on value creation, innovation, and knowledge flow to materialize a value proposition (Ganco et al., 2020; Kanda et al., 2021; Trevisan et al., 2022). These ecosystems have their own organizational model, their governance structures promote group cohesion and define roles, with an elected orchestrator managing resources and monitoring risks (Gomes et al., 2023; Konietzko et al., 2020; Oskam et al., 2021).

Ecosystems encourage distributed experimentation (Dentoni et al., 2021; Gomes et al., 2023; Oskam et al., 2021; Velter et al., 2020), support interaction between different stakeholders (Best et al., 2022; Konietzko et al., 2020; Verleye et al., 2024), and could focus on joint accounting to evaluate eco-innovation strategies (Best et al., 2022; Dentoni et al., 2021; Kristensen et al., 2021; Verleye et al., 2024). Such ecosystems play a nurturing role for participating organizations by facilitating access to shared resources, capabilities, and networks and developing collective intelligence as well as new dynamic capabilities for eco-innovation. Through these interactions, they can become catalysts for SBMIs in an external-internal approach.

The good news is that there is an increasing focus on society and business ecosystems in the business model research (Snihur & Bocken, 2022). The bad news is that despite growing academic attention on SBMI, managers are still navigating in the dark, research examining the interrelations between SBMI and business ecosystems remains scattered in strategic management literature with no unifying framework or rallying call to study its impact in a more coordinated and cumulative way (Geissdoerfer et al., 2018; Snihur & Bocken, 2022; Ringvold et al., 2023). While the notions of ecosystem and territory

have gained traction in sustainability research, their conceptual integration within SBMI studies remains underdeveloped. Specifically, the relational mechanisms through which territorial embeddedness and ecosystem structures shape SBMI are not yet clearly articulated. The current landscape of SBMI research is marked by a proliferation of fragmented models, frameworks, and conceptual tools, often developed in isolation and lacking interoperability.

Problem statement 2 (PS2): There is a need for integrative frameworks that explores how territorially rooted ecosystems influence, enable, or constrain the design and evolution of SBMI.

Problem statement 3 (PS3): There is a pressing need for a comprehensive meta-model that systematizes the micro-foundations of SBMI with a comprehensive business ecosystem view in a coherent and theoretically grounded structure.

Research method

This research adopts a qualitative approach to give 'primacy to the perspective of the informant rather than the expectations of the researcher' (Stern et al., 1998, p. 197). In fact, the focus of qualitative research is to gain a better understanding of phenomena through the experiences of those who have lived them directly, recognizing the value of participants' unique perspectives that can only be fully understood in the context of their experiences and worldviews (Yin, 2015). Since richness of information prevails in qualitative research (Patton, 1990), research informants were recruited based on their experience in the field of study.

Semi-structured interviews were conducted with experts based in Rio de Janeiro (Brazil) and in the Wallonia Region (Belgium), reflecting the two territorial contexts of the research. The selection of experts followed purposive sampling criteria aligned with the research questions:

RQ1. In what ways can internal organizational processes and external strategic engagements serve as micro-foundations of SBMI?

RQ2. In what ways can territorial dynamics and ecosystem-based interactions constitute micro-foundations of SBMI?

RQ3. How can existing fragmented models of SBMI be synthesized into a comprehensive framework that captures cross-scale and contextual dynamics?

Specifically, experts were selected based on their direct involvement in (1) the creation of sustainable business models, (2) the support of sustainability-oriented organizations (3) the development of local transition projects, or (4) the articulation of sustainable cooperation ecosystems.

As a result, both the Belgian and Brazilian teams interviewed CEOs, consultants, NGOs professionals, researchers, and members of public institutions. These individuals hold

leadership positions in sustainability, innovation, public policy, and entrepreneurship and collectively offer extensive experience across academic, governmental, and private sectors. Their areas of expertise include circular economy, cooperation ecosystem, strategic management of eco-innovation, social impact, sustainable territorial development, and public innovation – domains critical to addressing complex environmental, economic, and social challenges. Engaging this interdisciplinary group was essential for grounding the conceptual development of the open source SBMI model in diverse, context-sensitive perspectives. A detailed distribution of the experts, including their nationality, field of expertise, and experience, is presented in Appendix 1.

The interview protocol was developed based on the topics discussed in the previous section. Three pilot interviews were conducted to improve the consistency and comprehension of the questions and to guarantee that the responses were aligned with the research purpose. The final protocol allowed flexibility 'for exploratory, unstructured responses', as recommended by McCracken (1988, p. 25), by being structured in a funnel approach. In this sense, the interview starts with general questions (e.g., 'What are the main challenges faced by organizations in today's world?', 'How do you contribute to the necessary sustainable transitions?') and moves on to more specific questions (e.g., 'What kind of leadership is necessary for the transition?', 'How and why do sustainable ecosystems develop?'). The interview questions evolve as the interview progresses, which is considered a sign of a good qualitative research as indicated by Gioia et al. (2013). Moreover, illustrative figures were used and further explanations provided during the interviews whenever necessary to ensure the clarity of the questions. The final and complete interview protocol is presented in Appendix 2.

The interviews were carried out face-to-face or online (Microsoft Teams and Google Meet) and lasted between 50 and 90 min. The interviews were conducted between June 2024 and October 2024 and were fully recorded and transcribed. All interviewees were assured of anonymity. The interviews were stopped due to theoretical saturation (Glaser & Strauss, 1967), after achieving the count of 12 experts from Belgium and 10 from Brazil. Theoretical saturation does not mean that it is impossible to have a more complete analysis of the phenomenon studied, but rather that we have enough elements to construct robust theories explaining the social processes underlying our research question (Low, 2019).

The data analysis considered a two-stage approach: data processing and data elicitation. For the data processing, the process was started with an inductive approach based on Gioia's methodology (Gioia et al., 2013). Simultaneous data collection and analysis, data coding, and establishment of theoretical categories were conducted. Namely, as described in Table 1, the three main stages of Gioia's methodology were

Table 1. Methodological steps description

STEP	METHODOLOGY	DESCRIPTION	FURTHER DETAILS
01	Gioia's methodology: first-order codes	In the first-order analysis, initial themes emerged inductively from raw empirical data. Specifically, codes were assigned to each hermeneutic unit (i.e. groups of words or sentences) from the interview transcripts. The generated initial codes are therefore centred on the informant's terms.	At this step, the major risks are obtaining themes corresponding to the main interview questions (Clarke & Braun, 2013) or being too close and essentially adopting the informant's view losing the necessary higher-level perspective for informed theorizing (Gioia et al., 2013). To reduce these risks, Lejeune's recommendations were followed (2019) to prioritize the use of verbs in the first stage of coding and to have one member of the collaborative team who review all the codes.
02	Gioia's methodology: second-order themes	In second-order coding, constant comparison techniques were used to identify patterns, similarities, and differences in the data set. Such data examination contributes to identify whether the emerging themes suggest concepts that might help to describe and explain the phenomena under study.	Gioia et al. (2013, p. 20) suggest particular attention to emerging concepts that 'don't seem to have adequate theoretical referents in the existing literature' or existing concepts that 'leap out because of their relevance to a new domain'. Throughout the analysis, codes and concepts were refined by iterating between theory and data. The generated themes are therefore more researcher-centric.
03	Gioia's methodology: aggregated themes	In the aggregate dimension, the focus was on moving from a comprehensive set of first- and second-order codes to a more thematic data structure. It was explored whether it was possible to distil the second-order codes further into 'aggregate dimensions'.	This process led to the creation of a data structure (Table 2) which is a graphic representation of how the analysis progressed from raw data to final themes, which is a key demonstrator of rigour in qualitative research as discussed in Pratt (2008) and Tracy (2010).
04	Mind map: paradoxes	Additional tool. The previously discovered codes and themes are positioned in interactions inside the mind map. Furthermore, paradoxes were found throughout this research, which is why the study provides a mind map (Figure 3) that illustrates an example of a paradox and Table 3 that lists the paradoxes we found.	The mind maps and paradoxes clarify the opposing aspects from multiple perspectives, seeking to identify the barriers and underlying assumptions that underlie the possible conflicts in the scenario under consideration (Braathen, 2016). The resulting framework (Table 3) delineates the interconnections among the emerging concepts that characterize or elucidate the phenomenon of interest.

Source: own elaboration.

completed (i.e., first-order codes, second-order themes, and aggregated dimensions). In a fourth stage, a mind map was constructed as a complementary analytical tool to reflect the overarching data structure and reveal dynamic tensions through visual feedback loops. This step enabled the identification of paradoxes across both country contexts, later synthesized in Appendix 3. These paradoxes, together with the thematic structure, supported the proposition of the conceptual model for SBMI in ecosystem transitions, by linking the micro-foundations to broader systemic challenges.

Gioia's methodology steps resulted in the conception of a data structure, which is a static image of dynamic phenomena (Gioia et al., 2013). Nevertheless, as developed in the theoretical framework, SBMI is in essence a dynamic process. Consistent with the research objective, the data structure was analysed from a dynamic perspective to better reflect the organizational processes in place. Consequently, a mind map was integrated as an auxiliary instrument in the third phase of Gioia's methodology. A mind map is an effective tool for synthesizing qualitative and quantitative data, as it visually reveals both converging and conflicting issues arising from intricate social systems (Eppler, 2006). A paradox is defined as the simultaneous existence of seemingly contradictory elements that are mutually dependent (Wheeldon & Faubert, 2009).

Looping structures in mind maps and systemic diagrams, which emphasize cyclical tensions and interdependent contradictions, are frequently used to visually identify the emergence of paradoxes in complex systems (Eppler, 2006; Lassen et al., 2020; Wheeldon & Faubert, 2009).

Utilizing the mind map, researchers capture the diverse irreconcilable perspectives present in complex systems while actively identifying and analysing these paradoxes (Martiskainen & Sovacool, 2021). As Martiskainen and Sovacool (2021), and Lassen et al. (2020) suggest, this mapping process is crucial, as it helps to avoid the common analytical pitfall of oversimplifying reality or ignoring the diversity of interpretations surrounding a complex system, thus fostering self-management and self-regulation of activities. The identification of paradoxes arises from the synthesis of coded data and the development of the mind map. The mapping process reveals these paradoxes, as the visual representation uncovers underlying tensions and feedback loops.

Gradually, by consulting the literature and moving to dynamic interpretation, this research approach can be considered a transition from 'inductive' research to a form of 'abductive' research – which is considered another key demonstrator of rigor in qualitative research, as discussed in Alvesson and Kärreman (2007).

Results and discussion

This section presents three interconnected analytical layers. First, it identifies the main codes in the aggregated dimensions, illustrated by experts' quotes, thereby revealing the micro-foundations derived from empirical data. Second, it also details the complexity of the system and the emergence of paradoxes through the interpretation of tensions across aggregated dimensions. Third, it presents the new concepts and a meta-model for navigating SBMI complexity.

Micro-foundations and their interactions in SBMI

Emerging from data analysis and interpretation, five thematic aggregated dimensions, 16 second-order codes and 75 first-order codes were developed, forming the micro-foundations in SBMI and detailing the dynamics of territorial ecosystems. The codes are presented in Table 2.

Surprisingly, only a few significant differences could be observed between the statements of the Belgian and Brazilian experts. It was noted that the Brazilian experts had higher expectations on the role of public authorities, on the inclusion of civil society and the territorial approach, while the Belgian experts brought more discussion on alternative organizational models and new business models with a resigned attitude focused on how they can act on their own. One Belgian expert, working internationally, highlighted: 'I have worked in Italy, Germany, Morocco, so I can tell you that there are big differences, but it's the superficial layer. In the centre, they are still two-legged men. [...] The culture is different, but it's just a difference in terms of obstacles' (Belgian consultant, expert M). This notable alignment across contexts will be further illustrated in the following, which explores the five aggregated themes: regeneration of human energies, paradigm for sustainability, adaptability, societal legitimacy, and ecosystem transitions.

Regeneration of human energies

The regeneration of human energies appears to be a trigger for an SBMI process. Given the complexity of integrating socio-ecological issues, it is necessary to involve all employees in the innovation process. In this context, questioning the company's ambition and co-constructing a *raison d'être* (a purpose) leads to: 'a quest for meaning for the company, but also a quest for meaning for people, and so motivations are multiplied' (Belgian CEO, expert L). On the basis of this *raison d'être*, new narratives and a common vocabulary around the transition project can be developed:

Table 2. Framework of data structure

FIRST-ORDER CODES	SECOND-ORDER THEMES	AGGREGATED THEMES
Serving an evolutive <i>raison d'être</i> and questioning practices accordingly Mobilizing collaborators through ambitious and meaningful vision Combating superficial and incongruent practices Developing a common vocabulary regarding socio-ecological challenges Rethinking our relationship with competition and prioritizing contribution to the common good Raising customer awareness of socio-ecological issues Re-questioning what value and success is within the organization or ecosystem	Purpose-driven organization	Regeneration of human energy
Initiating transformation through leadership is essential for SBMI Training and evaluating leaders in participatory leadership Adopting a leadership of authenticity and vulnerability (humility) Developing sustainable territorial leadership Re-questioning your relationship with money, power and organization's ownership as a leader	Transformative leadership	
Put people back at the centre of the organizational project Raising collaborators' awareness of socio-ecological issues Aiming for happiness, harmony and collaborative relationships in the organization and beyond Give importance to each individuals' opinion and feelings Bringing diversity to teams	Human-driven organization	
Involving collaborators in the transformation dynamic according to their profile (e.g. cartesian, relational, spiritual) Assigning roles according to personalities or legemities Mobilizing support committees helping autonomous decision-making Developing new mindsets, narratives and cultures is essential for SBMI	Metacognitive differentiated management	
FIRST-ORDER CODES	SECOND-ORDER THEMES	AGGREGATED THEMES
Developing new mental models, narratives and cultures is essential for SBMI Developing a conflict management culture seeing opportunities in crises and paradoxes Make room for feminine values (e.g. empathy, cooperation, transparency) in organization. Developing a culture of questioning and reflective practices	Paradigm-shifting culture	Paradigm of sustainability
Mobilizing stakeholders in innovation process through transparent communication Mobilizing collaborators through inspiring socio-ecological narratives Leveraging people interest by showing economic and social synergies in eco-innovations	Mobilizing organizational change	
Measuring 'state of being' type indicators and human-related indicators above traditional indicators Establishing a double materiality on the various socio-ecological issues Re-questioning what value and success is within the organization. Accounting considering intangible assets and liabilities Performing cultural scans periodically to process tension	Accounting for the invisible	
FIRST-ORDER CODES	SECOND-ORDER THEMES	AGGREGATED THEMES
Relying on source principles to strike a balance between centralization and decentralization Developing adaptive governance varying decision-making mechanisms according to the context Co-creating guidelines for autonomous decision-making Mobilizing leaders (source principles) for vision, continuous training, communication, group harmony, structure, processes and action Structuring internal processes around collective intelligence to enhance adaptability	Androgynous governance	Adaptability
Implementing cellular organizational models (e.g. holacracy) to support distributed autonomy Avoid operating in silos, multiply the roles of staff and appoint thematic experts Decentralizing governance and leveraging collective intelligence Giving autonomy to operational actors	Living-system structures	
Taking the time to get to know each other well, and to create trust in a cooperation ecosystem Designing collective visions tailored to the specificities of each cooperation ecosystems, while respecting its source Organizing cooperation ecosystems around <i>raison d'être</i> , value distribution schemes, decentralized governance, source principles, conflict management scheme and inter-organizational teams Creating adaptive rooms for experimentation (e.g. eco-laboratory) spaces in cooperation ecosystems	Resilient ecosystem orchestration	
FIRST-ORDER CODES	SECOND-ORDER THEMES	AGGREGATED THEMES
Drawing inspiration from living systems and developing regenerative practices Prefer small, cooperative structures that leverage their contribution by sharing rather than growing organically Developing inclusive business models Developing multi-solutions and multi-cash flow business models Developing multi-local and connected business models Mobilizing marketing techniques and digital technologies to leverage circularity in business models	Metamorphic business model	Social legitimacy
Cooperating to innovate from the needs, culture and resources of the territory Constraining production and value chains to limited territories Localizing heavy materials production and delocalizing intangible productions	Territorial anchoring	
Developing financing lines for ecological and social projects Promoting the sustainable development with a holistic perspective of the territory Challenging the practices with an interconnected system network Relying on stakeholders as a strategic resource for successful SBMI Putting systemic perspective at heart of organizational culture Operating at a corporate activism looking for changes in the system in which organizations operate	Systemic connection	

(Continued)

Table 2 (Continued). Framework of data structure

FIRST-ORDER CODES	SECOND-ORDER THEMES	AGGREGATED THEMES
Cooperating with social economy actors and citizens (social ecosystem) Cooperating with complementary partners outside the value chain (innovation ecosystem) Cooperation within sectoral federations (sectoral ecosystem) Cooperating with diverse territorial actors (territorial ecosystem) Cooperating closely with value chain actors (value chain/territorial ecosystem) Surrounding yourself with other conscious leaders (leaders ecosystem)	Multi-ecosystem approach	Ecosystemic transition
Making territory with geographically distant actors (cosmo-local) Spreading the knowledge acquired during the sustainable transformation of the business model	Cosmo-local approach	
Accepting to take the time in the innovation process Fostering an entrepreneurial mindset based on purpose Experiencing projects within laboratory ecosystems Accepting to move forward in uncertainty Leave room for eco-laboratory spaces in the organization. Testing eco-innovation projects helps to initiate organizational transformation	Entrepreneurship mental model	

Source: own elaboration.

Because if we ever manage to tell a story that's going to touch people, where they're going to feel involved and say to themselves 'Yeah, that's true', then we'll be able to plant the little seed that's going to start the change [...] it's not by saying 'There's too much CO₂', that's too abstract, people don't get it, and that's normal, me neither; you see, it's beyond us. (Belgian CEO, expert O)

This *raison d'être* acts as a compass to guide the company in its projects and questions all its practices in a spirit of congruence: 'The company's reason for existing must be reflected in concrete actions, not just rhetoric. Nothing demotivates employees more than seeing a company preach sustainability while behaving in ways that contradict it' (Brazilian consultant, expert B). Nevertheless, this purpose must be coupled with a managerial ambition: 'I have understood that this transformation is above all a personal transformation' (head of Belgian public institution, expert K). This is why leadership transformation is a precursor and overarching part of the SBMI process: 'So I believe that if the people inside, but the leader first and foremost, have not experienced this transformation and this awareness, which is beyond our intellect, which is more in the heart than in the brain, I believe that we will never take the right actions that have a real impact' (Belgian consultant, expert V). Adopting a leadership of authenticity and vulnerability helps all stakeholders to engage in the eco-innovation projects:

Constructive and courageous leadership values listening to contradictory opinions, because challenges to consensus bring knowledge. A curious, kind and empathetic leader shows vulnerability, asks open-ended questions and is always willing to learn, creating a favourable environment for collaboration and collective innovation. (Brazilian CEO, expert G)

At first glance, these transformative leaders may be perceived as outliers, but: 'as in biology [...] at some point, they may be precursors because this aberration will spread so much that in fact it will contaminate everyone' (head of Belgian NGO, expert N). Little by little, the organization enters into collaborative dynamics in which the human being will be put at the

centre and training, collaboration and diversity will drive SBMI: 'I believe that ... when people feel a sense of belonging [...] engagement in innovation takes place. We need to create space where diversity and the exchange of daily experience are inclusive' (Brazilian CEO, expert I). Understanding personality profiles will spur human flourishing in which organizational changes and roles adapt to the profiles: 'Each individual will learn differently and therefore you need differentiated management, you must understand who the two-legged individual is in front of you: Why do they have their brakes? Why do they have their blocks?' (Belgian consultant, expert M).

Paradigm for sustainability

Gradually, the organization develops a new paradigm for sustainability. New mental models and narratives permeate the culture, while questioning and reflective practices become the norm. A good number of tensions are identified but they are also opportunities for development: 'The number one symptom of a team that does not perform well is the absence of conflict [...] the earlier we manage to deal with the conflict, the easier it will be to turn it into a positive' (Belgian researcher, expert U). Organizational and societal changes will be mobilizing since they will be based on transparent communication and social, economic, and ecological synergies:

Change happens when active listening and open dialogue align economic, social, and environmental priorities in a virtuous cycle [...] but, the cultural aspect remains the most significant challenge; it must be well aligned [...] to foster continuity and facilitate governance while respecting natural and human rhythms. (Brazilian public manager, expert C)

It is essential to re-examine the notion of value and success within the organization and consequently the resulting indicators. These indicators will be more open, human, and immaterial: "'Gross domestic product (GDP)'" needs to be replaced as the primary indicator that moves the world [...] giving way to metrics that dialogue with society, with respect for nature, with those actors who are invisible in the current economic logic' (Brazilian CEO, expert G).

Adaptability

In view of the increasingly fluctuating environment in which organizations operate, their adaptability is becoming a determinant of eco-innovation and a factor of success. Adaptability, as the ability to adjust to new or different conditions over the long term, goes beyond agility, which focuses on short-term changes. This involves a deeper and often more thoughtful adjustment to the new realities: 'Analysing local characteristics is essential for adapting the model to the reality of the

territory [...] proper adaptation is not just a quick response but conscious preparation for what lies ahead' (Brazilian activist engineer, expert E). This requires the development of adaptive governance, based on autonomy and collective intelligence: '[...] governance must be flexible enough to allow autonomy but, at the same time, ensure that everyone is collectively aligned with larger goals to transform the context' (Brazilian researcher, expert D). The source principles ensure an adaptive balance between decentralization and centralization of governance. The vision must be guaranteed by the people at the origin of it: 'first of all, there is the source person who guarantees the vision, who says this is where we are going, but it is not them who does it, it is not them who orchestrates it' (Belgian CEO, expert Q). Even if the latter can be questioned, there is a commonly accepted form of centralization. On the other hand: 'we have to appoint someone who will have the impetus to say that they have the talent for orchestrating, for putting processes [...] Then another one, it's going to be the talent of harmony, of bringing people together, of ensuring information transfer, etc.' (Belgian CEO, expert R). As a result, not all powers are centralized and decentralization is regulated by safeguards, adapting according to the context: 'As a source person, I have made the pitfall, as the source of being the one who organizes, who structures, who facilitates all this in fact, and that gives a real mess' (Belgian CEO, expert R). Leaders must 'develop this sensitivity, namely how, when and where to step in or stay back as a leader' (Belgian researcher, expert U). This governance is anchored in a transversal structure, which can be inspired by the cellular organization of living systems: 'we are very close to the rules of nature and robustness' (head of Belgian NGO, expert N). Similarly, SBMI are generally closely linked to cooperation ecosystems. These inter-organizational and multi-stakeholder groupings must be organized according to the same principles as those developed above because 'in the centre, they are still two-legged men' (Belgian consultant, expert M). Therefore, organizing cooperation ecosystems around *raison d'être*, value distribution schemes, decentralized governance, source principles, conflict management scheme, and interorganisational teams ensures their resilience and long-term orientation.

Societal legitimacy

Sustainable business models have different characteristics that develop their metamorphism, and their ability to eco-innovate. First of all, these are inclusive business models rooted in their territory:

Local product, environments, and ways of life must be valued, and the history and processes that shape the region must be respected. Sustainable business models need to be inclusive and adapted to the uniqueness of territory, where innovating in a plural and

purpose-driven way is essential to anchor the model to the local context. (Brazilian consultant, expert H)

Production activities and value chains tend to be limited to territories, which pushes the development of multi-local approaches (i.e., the replication of the business model within different connected territories):

The multi-local approach is the first step in a plan in which we want to be able to contribute across a wider territory, but in a local way [...] There are ecosystems of sites that will talk to each other, and these human and logistical ecosystems anchored in a certain place, the challenge for us is to duplicate them. (Belgian CEO, expert O)

Secondly, they are characterized by expertise translated into multi-solutions that promote resilience by leading to a multi-cashflow approach:

the diversification of cashflow, consultancy, training and the sale of equipment, it allows us to subsidize the main delivery activity. One of the reasons was to say to ourselves, we can't wait to grow organically and to grow only when we're sure we're going to be profitable in the delivery business. (Belgian CEO, expert T)

By drawing inspiration from living systems, these business models form small structures that grow transversally rather than organically:

In order to expand our successful models to new regions, it is essential to go beyond mere replication. We need to immerse ourselves in the characteristics and nuances of each location [...] [a model] that not only adapts to the new context, but is also enriched by it, by the voices and knowledge of the territory. (Brazilian public manager, expert C)

Even if material production tends to be localized, intangible production tends to be decentralized. Hence, the systemic connection is at the heart of these business models that seek to be connected with different external actors on, and outside, the territory: '[...] only makes sense today with the five players together. The university, startup, venture capital, corporate and government approaches. I don't see any other way out' (Brazilian researcher, expert A). With their societal legitimacy, organizations then seek to influence the sector, and even further, the entire system in which they operate: '[...] [the aim is] for this project to be [...] I would say [...] successful both within the municipality and outside it, replicating its impact in other places' (Brazilian CEO, expert F).

Ecosystemic transition

The purpose of SBMIs is to drive ecosystemic transitions in which many different actors participate and benefit from eco-innovation projects. We have found that there are

different types of ecosystems surrounding leaders and organizations: social, territorial, leader, innovation, and sectoral ecosystems. Cooperation is thus at the heart of eco-innovation processes: 'If we don't achieve these connections, these forms of cooperation, and this vision of openness, we will find it difficult to achieve and make a (transition) project last' (Brazilian manager, expert J). Cooperation is also essential for the mental health of leaders, it 'helps a lot from a personal point of view, otherwise it would be very, very difficult' (head of Belgian public institution, expert K). The knowledge acquired during eco-innovation processes is thus shared between organizations in a logic of continuous improvement and leveraging societal contributions. These cooperations do not stop at the territorial level and territorial ecosystems are formed in a cosmo-local dynamic:

But at the same time, if we don't couple this relocation with a collaboration that we will call cosmic or planetary, we risk falling into isolation and less innovation, more slowness, etc. And so, it is precisely the combination of both that I call cosmo-localism, and the idea is to combine local differentialism and the universalism of digital collaboration. (Belgian researcher, expert S)

Finally, to bring about ecosystem transitions, it is necessary to develop an entrepreneurial mindset: '[...] essential for transforming the culture [...] a turning point that aligns academic knowledge with practical innovation and the intrapreneurial movement' (Brazilian researcher, expert A). In this context, ecosystems can help test eco-innovation projects by sharing the risks:

We are a governance laboratory, a project laboratory because we all say to each other 'let's come and test this in our ecosystem', and then we each go to our different professions, to the university, to the companies, to sow the seeds. Starting from scratch in a company and wanting to revolutionize, it's complicated, first of all, let's embody ourselves, first of all, live things ourselves. (Belgian CEO, expert R)

A framework to deal with paradoxes in SBMI

The micro-foundations of SBMIs defined in the previous section are interrelated and form what could be understood as a complex system. Indeed, dealing with sustainability issues increases the level of systemic complexity (Talukder et al., 2020) and, this complexity is increased by SBMI due to non-linear feedback loops, distributed agency, and inter-organizational interdependence in ecosystem transitions (Prihadyanti, 2023). In this context, SBMI is not isolated but is integrated within dynamic and evolving ecosystems, where various actors and values interact concurrently.

The concept of complexity relates to an emergent property of systems composed of numerous interconnected elements. Such systems exhibit a complex structure (i.e., the

elements are assembled in a non-trivial and non-linear way) and a complex behaviour (i.e., the behaviour of the system is irreducible to the behaviour of its components). Complexity is to be distinguished from the complicated aspect of a system, a complicated system is composed of many elements but relatively few interactions and little structure (Mack & Khare, 2016).

Importantly, complexity is not identical to paradox, yet paradoxes frequently arise within complex systems when organizations confront demands that are both interdependent and contradictory. As organizations navigate conflicts such as the necessity for multi-actor collaboration and the urgency to accelerate innovation, these paradoxes emerge within the framework of SBMI. These conflicts necessitate adaptive management strategies that recognize their enduring and interdependent nature, rather than perceiving them as simple trade-offs to be settled.

The dynamic of the relationships between the SBMI's micro-foundations is depicted in Figure 1 through a looping structure that illustrates the paradox between multi-ecosystem collaboration and innovation pace. This paradox arises from the interaction of two empirically supported micro-foundations: (1) multi-ecosystem approach, supported by first-order codes such as collaborating with citizens and social economy leaders, working with regional federations, and establishing partnerships beyond the value chain; and (2) entrepreneurial mindset, demonstrated by the codes allowing one to devote the necessary time and uncertainty to the innovation process. Figure 1 displays words in red indicating polarities that come from these micro-foundations and their respective codes, highlighting tensions that are implied in the related practices even though they are not named explicitly in the interviews. The map demonstrates that inclusive innovation requires the development of numerous collaborations and, at the same time, faces market pressure due to response speed and agility. This paradoxical loop explicitly outlines the main contradiction: collaboration increases the legitimacy of innovation while also slowing down processes and intensifying the competitive pressure to reduce.

Nevertheless, such micro-foundations illustrate how practitioners approach the paradox. Engaging multiple ecosystems enables actors to draw on diverse resources, perspectives, and value propositions, which not only enhances creativity but also spreads the risks associated with experimentation. At the same time, an entrepreneurial mindset fosters the capacity to advance under uncertainty, to test several pathways in parallel, and to accept the iterative nature of innovation processes. Together, the micro-foundations could transform the tension itself into a productive force: while collaboration may slow immediate response times, it ultimately expands the range of possible solutions and supports more robust and inclusive innovation trajectories.

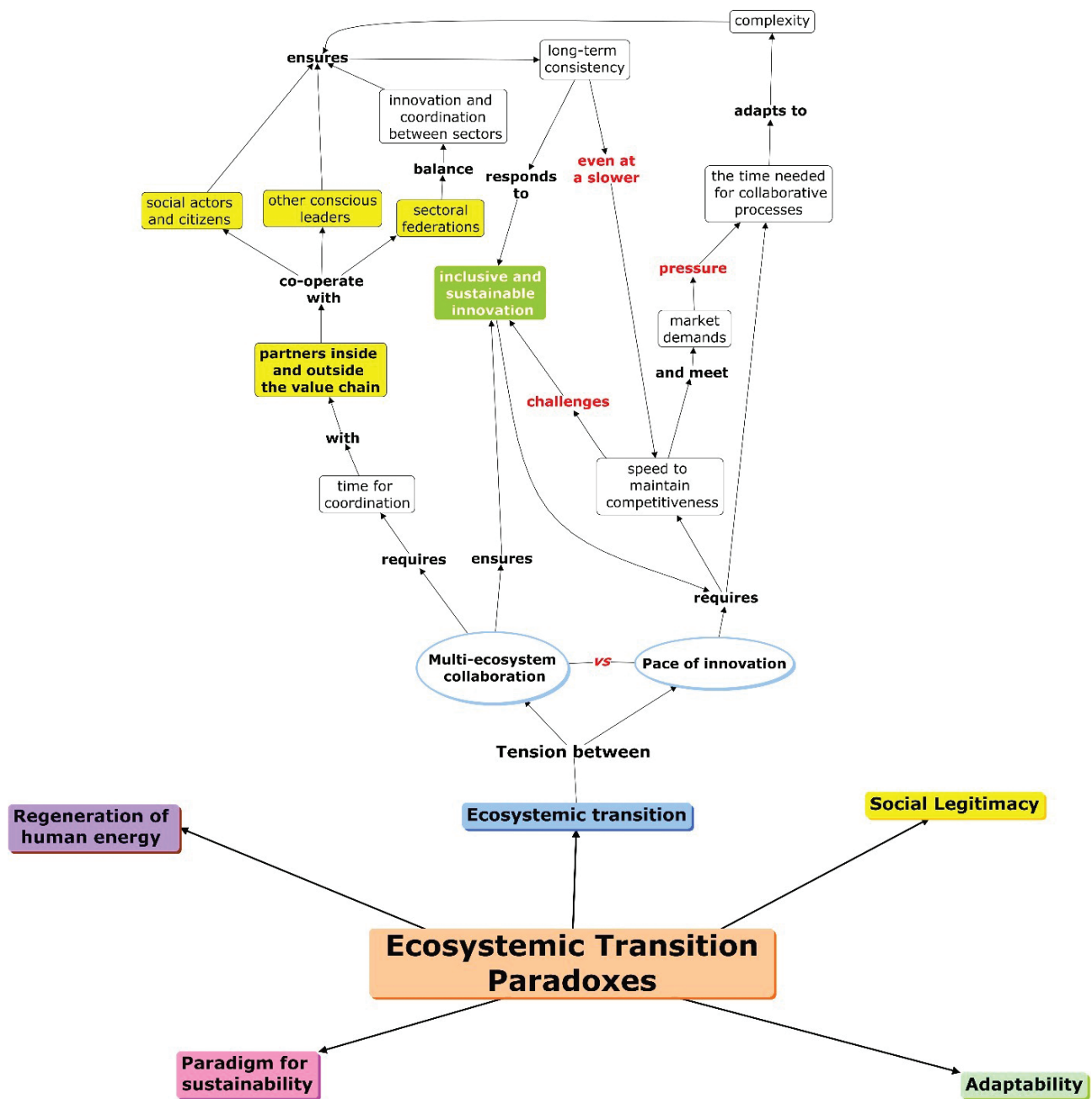


Figure 1. Example of a paradox arising from SBMI.
Source: own elaboration.

Apart from the case illustrated in Figure 1, Appendix 3 provides more examples of paradoxes identified throughout the study, while Appendix 4 provides transparency on how each paradox was empirically identified by methodically detailing the relationship between microfoundations, first-order codes, and identified paradoxes. Specifically, the integration of thematic coding in a mind map revealed these paradoxes, hence enabling a better knowledge of the

interdependent tensions defining SBMI in ecosystem transitions. Every paradox is based in the empirical evidence and shows a dynamic to be acknowledged, navigated, and controlled rather than a contradiction to be resolved. These ideas help to fuel the continuing discussion on how systems thinking, paradox, and complexity support sustainable innovation approaches (Lassen et al., 2020; Velter et al., 2020).

The paradoxes can unbalance eco-innovation processes, which reinforces the necessity to study and learn about them (Breuer et al., 2018). Figure 2 presents and describes the paradoxes as complex problems in SBMI that need to be

recognized and managed. Managing polarities increases the ability of leaders to distinguish between problems that can be solved and polarities that cannot be solved, in addition to showing how to effectively manage unsolvable problems

	NAME OF PARADOX	DESCRIPTION	MICRO-FOUNDATIONS (= LEVERS)
REGENERATION OF HUMAN ENERGY	DISRUPTIVE LEADERSHIP ↕ BELONGING AND UNFAVOURABLE CONTEXT (ISOLATION)	The need to innovate and transform in challenging environments with limited resources pushes leaders to overcome structural barriers, yet scarce support and obstacles hinder disruptive innovation.	Purpose-driven organization, human-driven organization
	EVOLUTIONARY PURPOSE ↕ MARKET PRESSURE AND PRESERVING THE STATUS QUO (SELF-DECEPTION)	The evolutionary purpose demands continuous change, innovation, and adaptation, while preserving the status quo and seeking stability, resisting change, or making only minor adjustments to stay within the comfort zone. This leads to self-deception.	Purpose-driven organization, human-driven organization
	EVOLUTIONARY PURPOSE ↕ COERCIVE ISOMORPHISM	Organizations aim for authentic innovation that reflects their essence. However, prevailing norms and structures in the ecosystem often pressure them toward standardization over differentiation and authenticity.	Purpose-driven organization, metacognitive-differentiated management
	TECHNOCENTRIC/HIGHLY SPECIALIZED TRAINING ↕ TRANSVERSAL AND INTERDISCIPLINARY LEADERSHIP	Technocratic training provides deep expertise in a specific field but can challenge leadership, which demands multidisciplinary knowledge across areas.	Transformative leadership, metacognitive-differentiated management, human-driven organization
PARADIGM FOR SUSTAINABILITY	EVALUATION AND CRITICAL REFLECTION ↕ OPTIMIZATION AND IMMEDIATE RESULTS	Critical thinking fosters sustainable, quality decisions, but today's urgency often sacrifices depth and quality for quick resolutions.	Counting the invisible, culture of paradigm shift
	LOCAL RESILIENCE ↕ RISKY REFUGES	Local resilience requires communities and organizations to adapt to their conditions, but this can sometimes lead to seeking 'risky refuges' (such as short-term strategies or solutions that are not sustainable in the long term).	Culture of paradigm shift, counting the invisible
	CULTURAL MOBILIZATION AND INNOVATION ↕ COGNITIVE BIASES AND ANCESTRAL KNOWLEDGE	Cultural mobilization aims to shape norms and foster a more inclusive, collaborative environment, but individual cognitive biases can hinder change.	Mobilizing organizational change, culture of paradigm shift, counting the invisible
ADAPTABILITY	CENTRALIZATION ↕ DECENTRALIZATION AND HIDDEN POWER STRUCTURES	Centralization versus decentralization concerns the formal distribution of authority, while invisible hierarchies in a decentralized environment can lead to passive-aggressive power plays.	Androgynous governance, structure of a living system
	SOCIAL INCLUSION ↕ GLOBAL MARKET-ORIENTATED ECONOMY	Social inclusion seeks an equitable distribution of resources for those who do not have access to global opportunities, while economies of scale foster growth but limit the benefits to other privileged social groups.	Orchestration of resilient ecosystem, structure of a living system
	DIVERSITY AND ECOSYSTEM OF COOPERATION ↕ POWER DYNAMICS AND VISION ALIGNMENT	Diversity is crucial for innovation, but aligning around a shared vision can be challenging. Conversely, cooperative ecosystems aiming to maximize collaboration are threatened by toxic power dynamics, which create divisions and sabotage harmony.	Orchestration of resilient ecosystem, structure of a living system, androgynous governance

Figure 2. Paradoxes framework.
Source: own elaboration.

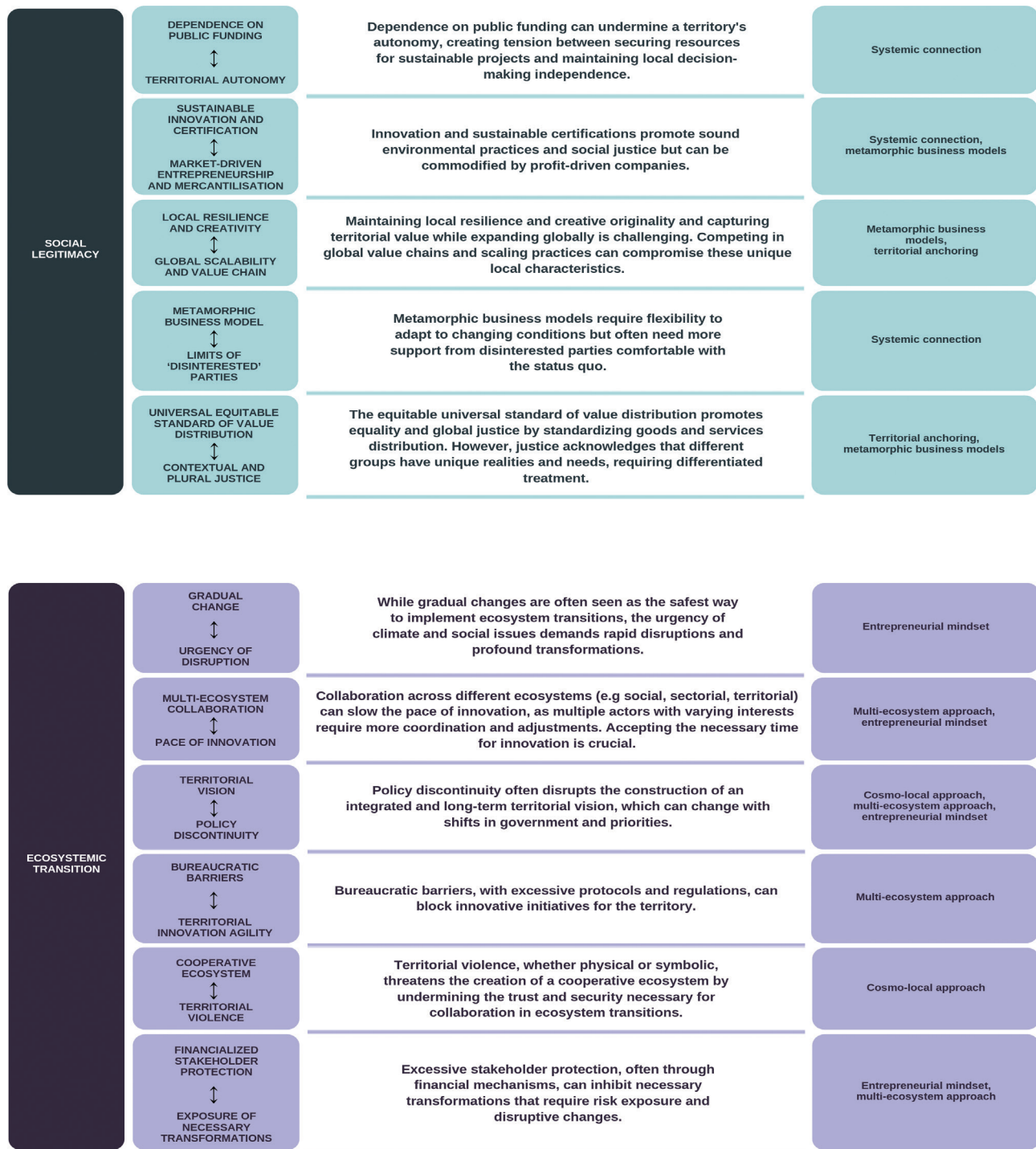


Figure 2 (Continued). Paradoxes framework.
Source: own elaboration.

(Manderscheid & Freeman, 2012). In this sense, the analysis of codes and the understanding of paradoxes allow the proposition of micro-foundations for SBMI in a context of dynamic interactions with territory and ecosystems. These proposed

micro-foundations are partial levers for sustainable transitions, which require constant recognition of the paradoxical nature of systems, without clinging to one of the poles of the paradox. It is worth noting that the paradoxes exist in both countries.

In summary, the paradoxes outlined in this section illustrate contradictions that are not restricted to institutional or structural arrangements, but also reflect ways of thinking about and interpreting the role of sustainability. The way organizational actors deal with issues – for example, multi-ecosystem collaboration versus the pace of innovation, or centralization versus decentralization – is anchored in mental models that drive their views of value, success, and time. Recognizing the paradoxes, therefore, implies understanding that navigating them depends on cognitive and paradigmatic changes (Angheloiu & Tennant, 2020; Velter et al., 2020). At this point, room opens up for the modelling described in the following section which aims to articulate the phases of SBMI, starting with adjustments in mental models and prevailing social paradigms.

A model to navigate the SBMI puzzle

Following the analysis of the micro-foundations of SBMI through both internal–external and external–internal lenses, as well as the paradoxes inherent to these dynamics, it becomes possible to model their implementation. A phasing exercise was therefore conducted to identify the major stages of SBMI. In a first stage, and within an internal–external logic, shifts in mental models – and consequently in leadership and governance structures – emerged as a fundamental basis for SBMI. Indeed, the tensions within different approaches to sustainability can be explained, in part, by a difference in mental models or paradigms from which sustainability issues are addressed (Davelaar, 2021). For Milne et al. (2009), every organized society has a dominant social paradigm, composed of values, meta-physical beliefs, institutions, habits, etc., and which collectively provide social lenses through which individuals and groups interpret their social world. In the same vein, Meadows's work shows that transformation requires a change in mental models (Angheloiu & Tennant, 2020). The results of this research show that at the centre of an SBMI there is a change in the mental models of the organization's key leaders. These leaders, becoming aberrant for a time, gradually bring other actors on board with them through transformative leadership. Therefore, the results are aligned with those of Kurucz et al. (2017) who introduce relational leadership capabilities, considering leadership as a dynamic process shaped by interactions within organizations to integrate sustainability into business practice. Similarly, our results show that these leadership styles extend to the ecosystem level, where leaders must connect with stakeholders to accomplish societal goals (Averina et al., 2022; Konietzko et al., 2020). In this internal–external approach, the paradigm shift is therefore rooted in the shift of the main leader(s) and propelled by new, more human leadership styles.

As stated by some interviewees (experts A, G, Q, R, and U), the source principles may help to describe the internal–external dynamic in SBMI. The source principles, which were

originally proposed by Peter Koenig, then a management consultant, state that every human initiative – from projects to parties to entire businesses – starts with one single founder, the primary source. The source is the person who takes the first risk to implement an idea. Koenig shows that identifying the source, acknowledging them as such and working consciously with their vision is key to creating a harmonious endeavour and avoiding innovation to fail (Nixon, 2021). The culture of 'their' organization cannot develop substantially if the source does not also develop personally (Meissner et al., 2024).

However, a source is rarely able to fully manifest their initiative alone and needs help. Facilitators bring specific ideas and carry out actions to implement the vision. Other agents help the source better articulate their vision or expand it in ways the source had not thought of. When an agent takes the initiative to realize a part of the source's vision, they function as a source for that part, the one who has the vision, feels the passion and comprehends the next step. In a company, this secondary source could be someone taking the initiative to produce a tool, a new product, or to be responsible for the harmony in some projects (Nixon, 2021).

Through looking at an organization and mapping the initiatives of a primary source and the source's agents, it is possible to develop a picture of an organization, mapping its operations to a very high degree of complexity. This way of organizing is closed to concepts of holacracy, sociocracy, or teal organization (experts I, K M, R, S, T, U), as stated by interviewees, and belongs to a broader concept of liberated firm (experts D, F, L, M, and Q). In liberated firms, humans are put at the centre of a firm's concerns and strong values of social and environmental responsibility are respected (Antoine et al., 2017). It leads to some specificities that emerge from our interviews: decentralization of decision-making, reduction of controls, flattened structure, participative leadership, etc. (Khoury et al., 2024). Consequently, the results show that organizational models get closer to living-systems organizations which, according to Hamant (2023), develops the robustness of organizations. Such living-systems are inherently open to their environment and tend to develop cooperative strategies with their stakeholders (e.g., Averina et al., 2022; Fontainha et al., 2022; Konietzko et al., 2020), reinforcing adaptability and long-term sustainability.

In a second stage, SBMI appeared to be nourished by an external–internal dynamic, which strengthens the internal–external processes already underway and may also give rise to new eco-innovation trajectories. This stage highlights the existence of multiple cooperation ecosystems:

1. leaders ecosystem: transition leaders are connected and organise thematic discussions;
2. social ecosystem: the organization is connected with civil society actors and/or social and solidarity economy agents;

3. territorial ecosystem: various actors of the territory are connected, including public authorities, in favour of the sustainability of the territory;
4. innovation ecosystem: players from different spheres and scales of society are connected to materialize a new sustainable value proposition;
5. sector ecosystem: players of the same sector are connected in favour of the sustainability of the sector;
6. value chain ecosystem: actors of the same value chain cooperate closely. This ecosystem can be compared to a territorial ecosystem given the desire for relocation.

Each cooperation ecosystem may assume multiple profiles (e.g., territorial, social and innovation ecosystem). To this extent, the results show that the ecosystem approach lies at the core of SBMI (e.g., Amir & Prabawani, 2023; Bolton & Hannon, 2016; Dentoni et al., 2021), encompassing different forms and objectives. Furthermore, even though territorial ecosystems are essential (e.g., Maillefert & Robert, 2017; Stasiškienė et al., 2021; Winn & Pogutz, 2013), they are far from sufficient. From the cosmo-local approach, several experts from both territories emphasized the need to localize material-intensive production while globalizing immaterial production. Cosmo-localism pushes to create resilience locally by sharing resources globally as 'digital commons'. Cosmo-localism is not characterized by an external-internal dichotomy; instead, it is defined by associative modes that unify local communities without reducing their

locality (Bauwens et al., 2019). All these findings provide responses to PS1 and PS2, as previously introduced, and are summarized in Table 3 together with the references mobilized throughout this analysis.

The framework presented in Table 3 highlights the micro-foundations of the internal-external and external-internal approaches involved in SBMI. However, Table 3 presents a static perspective that does not capture the potential interrelations between these approaches. Therefore, in response to PS3, and to provide indications of how the internal-external and external-internal approaches are interconnected for SBMI, this research proposes a meta-model for eco-innovation (Figure 3). This interactive model of micro-foundations in SBMI reflects the stages outlined earlier in the text.

Some key components merit further details. The heart of Meta-MEI is the regeneration of human energies. The key leaders have a new ambition, embodying the purpose of the organization that they share through transformative leadership. As the organization does not act in a vacuum, this leadership is embedded in a multi-ecosystem approach that fosters SBMI processes. For SBMI to succeed, organizations must develop a cultural paradigm aligned with sustainability issues, cultivate an entrepreneurial mindset to detect and develop new sustainable opportunities, and mobilize all employees in organizational change through new narratives. Meta-MEI relies on androgynous governance, which is decentralized but contingent on the context and is embodied by stereotypical values of

Table 3. Theoretical and empirical contributions to PS1 and PS2

Problem statement	Dominant approach	Theoretical framework: micro-foundations and references	
PS1	Internal-External	<ul style="list-style-type: none"> Leadership And Mental Models: Regeneration Of Human Energy And Paradigm For Sustainability Organizational Design: Androgynous Governance, Living-System Structure, And Metamorphic Business Model External Strategy: Systemic Connection 	<ul style="list-style-type: none"> Angheloiu & Tennant (2020); Davelaar (2021); Kasmi et al. (2022); Khan et al. (2020); Kurucz et al. (2017); Milne et al. (2009); Nixon (2021); Meissner et al. (2024); Sehnem et al. (2019) Antoine et al. (2017); Khoury et al. (2024); Hamant (2023); Hofmann & Zupphausen-Aufseß (2022); Kristensen et al. (2021); Madsen (2020); Ringvold et al. (2023); Santa-Maria et al. (2022); Seles et al. (2022); Stubbs (2019); Tabares (2021); Troise et al. (2023) Amir & Prabawani (2023); Astorino (2024); Bhardwaj et al. (2022); Costa et al. (2023); Djibo et al. (2023); Van Eechoud & Ganzaroli (2023); Fobbe & Hiltefth (2021); Khan et al. (2020); Lippolis et al. (2023); O'Reilly & Tushman (2008); Oliveira-Diaz et al. (2022); Pichlak & Szromek (2021); Santa-Maria et al. (2022); Sehnem et al. (2019); Seles et al. (2022)
PS2	External-Internal	<ul style="list-style-type: none"> Resilient Ecosystem Orchestration Territorial Anchoring Multi-Ecosystem Approach Cosmo-Local Approach 	<ul style="list-style-type: none"> Averina et al. (2022); Best et al. (2022); Dentoni et al. (2021); Ferrari et al. (2023); Iizuka & Hane (2021); Konietzko et al. (2020); Ferrari et al. (2023); Lippolis et al. (2023); Madsen (2020); Velter et al. (2020); Verleye et al. (2024) Amir & Prabawani (2023); Cardoso et al. (2024); Costa et al. (2024); Costa & Xavier (2023); Dentoni et al. (2021); Fontainha et al. (2017, 2022); Maillefert & Robert (2017); Moulart & Ailenei (2005); Pamplona et al. (2024); Stasiškienė et al. (2021); Winn & Pogutz (2013); Xavier et al. (2024) Adner (2017); Jacobides et al. (2018); Konietzko et al. (2020); Bauwens et al. (2019); Harris et al. (2017)

Source: own elaboration.



Figure 3. Meta-MEI: meta-model for eco-innovation.
Source: own elaboration.

both women and men (e.g., Hardaker et al., 2023), to support cultural changes. Structures inspired by living systems and a human-driven purpose reinforce this virtuous circle, enabling cultural transformation and sustainability. The resulting differentiated management is called metacognitive because it seeks to get the best out of each individual, in a collective dynamic. By eco-innovating, organizations seek to develop metamorphic business models, that is, business models that are not only resilient, but also adaptable (multi-local), flexible (multi-solutions),

and system-transforming. Cooperation and territorial anchoring are inherent to these business models. For ecosystems to sustain, they are organized in a resilient way by drawing inspiration from previously developed organizational models. The ecosystem is none other than a particular form of organization. To measure and monitor the progress of SBMI, accounting needs to be broader, more open, and more intangible. The measured progress and learning can be shared through systemic connection and a cosmo-local approach. The loop is

closed when shared learning allows the lessons of some organizations to directly reinforce the SBMI processes of others.

Therefore, the Meta-MEI identifies distinct interrelated phases within SBMI. Initially, following a primarily internal-to-external trajectory, the process involves the regeneration of leadership, the development of purpose-driven organization, transformative leadership, and human regeneration. Subsequently, a more external-to-internal orientation emerges, exemplified by the multi-ecosystem approach. Finally, various micro-foundations operate concurrently, following either a more internal-external (e.g., androgynous governance, meta-cognitive-differentiated management, mobilizing organizational change) or external-internal logic (e.g., cosmo-local approach, resilient ecosystem, territorial anchoring). These phases appear to unfold simultaneously; however, their sequence remains critical. For instance, if leadership regeneration does not occur, the likelihood of success in subsequent phases is significantly diminished. An explanation might be that this phase is a vital component in the capability to sense sustainable opportunities. In this respect, without the development of purpose-driven organization, transformative leadership, and human regeneration, seizing such opportunities is unlikely. Furthermore, the organizational reconfiguration required for successful SBMI relies on a combination of micro-foundations, such as the multi-ecosystem approach, the adoption of living-system structures or the implementation of metamorphic business models.

In this sense, the dynamic capabilities (Teece et al., 1997) correspond to the common denominator of all these micro-foundations. Indeed, the micro-foundations can develop the organizational capabilities to detect and seize sustainable opportunities and reconfigure themselves accordingly. However, the dynamic capability framework does not sufficiently consider the internal-external approach and a new capability of 'projection' comes into play, in other words, the ability to evaluate SBMI and project the acquired knowledge and practices into other environments so that the benefits, from a sustainable point of view, could be multiplied. Indeed, it was observed that leaders were looking to measure, standardize, and spread their eco-innovations. Subsequently, in the case of SBMI, these dynamic capabilities seem to have a particular characteristic: they are sourced from the ambition of the leaders.

Final considerations and research implications

This study shows that the SBMI is a complex system full of paradoxes and brings theoretical, institutional, and managerial contributions by describing the paradoxes as well as the microfoundations that play the role of levers.

From a theoretical standpoint, the findings underscore the central role of human actors and cognitive dimensions in

organizational transformation. Changes in mental models, interpretive frameworks, and leadership orientations emerge as fundamental drivers of SBMI. These results point to the importance of integrating cognitive and behavioural dimensions into SBMI research, suggesting that further dialogue between management sciences and psychology could enrich understanding of sustainability-oriented organizational change.

The study further contributes to the literature by conceptualizing two complementary strategic orientations: an internal-external approach, wherein internal transformation enables influence on the broader business ecosystem; and an external-internal approach, whereby organizations draw upon ecosystemic resources and territorial anchoring to reshape internal processes and strategies. This dual perspective enables a more dynamic understanding of how organizations position themselves within, and act upon, complex and evolving environments.

In this respect, this research identifies a new dynamic capability described as *projection* – the ability to evaluate SBMI and project the acquired knowledge and practices into other environments so that the benefits, from a sustainable point of view, could be multiplied. This concept extends existing frameworks of dynamic capabilities by capturing how eco-innovation can be disseminated through cosmo-local and multi-actor strategies, thereby enhancing systemic impact. While the dynamic capabilities theory appeared to adequately address the external-internal approach, particularly through sensing and seizing capabilities, the internal-external approach remained underdeveloped. In response, the projection capability is introduced to capture this outward dynamic and opens promising new research avenues. It is essential to explore when and how organizations develop this capability. There may also be varying degrees of projection capability, which should be systematically identified.

Furthermore, the results underline how external-internal approaches can nourish SBMI through strategies such as resilient ecosystem orchestration, territorial anchoring, multi-ecosystem engagement, and cosmo-local approach. It offers new insights into the territorial embeddedness of SBMI. Indeed, two territorial logics are distinguished: one grounded in geographical proximity and resource anchoring, and the other based on relational trust across multi-ecosystem and cosmo-local configurations. This dual perspective challenges the prevailing assumption that SBMI must remain locally confined and encourages a more nuanced understanding of territoriality as both spatial and relational.

In this regard, the study also highlights important implications for public policy. Institutions can play a critical role by supporting ecosystem orchestration, identifying and mobilizing local territorial assets, and facilitating international linkages through cosmo-local mechanisms. These mechanisms can reduce fragmentation, accelerate coordination, and sustain

long-term transitions. The empirical context of this research, which is supported by public institutions, illustrates the added value of public-sector involvement in enabling international cooperation. Future research should look at the differences that may exist in the orchestration of ecosystems, depending on their type and their international openness.

Managerially, the study provides operational guidance for organizations seeking to engage in SBMI. The Meta-MEI offers a structured pathway that can be used in at least three complementary ways. First, it can serve as a practical roadmap: by delineating the main phases of transformation and the corresponding micro-foundations, the model guides organizations in designing and sequencing their practices. For instance, it stresses the importance of initiating change at the cognitive and cultural levels – through leader regeneration, purpose-driven orientation, transformative leadership, and human regeneration – before moving toward structural and strategic reconfigurations. Second, the Meta-MEI can be applied as an assessment tool: managers may use it to evaluate their ongoing SBMI initiatives, identify which microfoundations are already in place, and detect potential gaps that may hinder progress. Such a diagnostic function provides organizations with a clearer picture of their maturity and orientation in terms of eco-innovation, while also highlighting actionable levers for improvement. Third, the model helps organizations navigate the complexity and paradoxes inherent in SBMI. The framework draws attention to tensions – such as centralization versus decentralization or hidden power structures – that often undermine eco-innovation. By connecting these paradoxes with possible strategic responses – such as androgynous governance and living system structures – the Meta-MEI equips managers with conceptual tools to anticipate, reframe, and address these dilemmas more effectively.

In this sense, the Meta-MEI is more than a theoretical synthesis: it is an actionable meta-model that supports strategic decision-making, facilitates organizational learning, and enables corporations to advance eco-innovation initiatives in a more robust, scalable, and context-sensitive manner. Nevertheless, the Meta-MEI model still requires refinement. Future research should test and validate the Meta-MEI in different geographical and institutional contexts, in order to assess its transferability and enable its practical relevance. Moreover, not all microfoundations appear to hold equal weight; while some may function as critical enablers, others act as contextual or reinforcing elements. Future studies could thus investigate distinct SBMI profiles and the variability of micro-foundation configurations across these profiles.

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Appendices

Appendix I. Profiles of Brazilian and Belgian experts

Interviewee	Nationality	Field of expertise	Experience
Expert A	Brazilian	Food systems, urban sustainability, digital commons	Entrepreneur engaged in transforming food systems through collaborative, community-based models. Works to connect producers and consumers through inclusive governance and digital platforms promoting food sovereignty.
Expert B	Brazilian	Climate finance, impact investing, green economy	Expert in structuring financial mechanisms for the green economy. Advocates for integrating climate justice and biodiversity into sustainable finance and policy frameworks.
Expert C	Brazilian	Sustainable business ecosystem, public policy, regenerative economy	Policy advisor and researcher promoting the development of sustainable business ecosystems. Focuses on the intersection between economic development and ecological limits in institutional contexts.
Expert D	Brazilian	Business education, regenerative economy, eco-innovation	University professor and consultant fostering regenerative economic thinking. Works to integrate ecological awareness and systemic innovation into entrepreneurship and management education.
Expert E	Brazilian	Digital economy, commons-based innovation, sustainability	Researcher exploring the convergence of digital technologies and sustainability. Promotes commons-oriented production models and collaborative governance frameworks.
Expert F	Brazilian	Eco-innovation ecosystem, sustainable entrepreneurship	Entrepreneur and ecosystem builder working at the intersection of sustainability and innovation. Supports startups and initiatives with high socioenvironmental impact through networks and incubators.
Expert G	Brazilian	Eco-design, social innovation, circular economy	Designer and changemaker committed to eco-design and circular innovation. Develops participatory approaches to sustainability through creative processes and material reuse.
Expert H	Brazilian	Regenerative development, local economies, education	Works with community-led development, focusing on regenerative practices, empowerment, and territorial resilience. Encourages learning-by-doing in sustainable transitions.
Expert I	Brazilian	Agroecology, food sovereignty, rural development	Specialist in sustainable agriculture and rural innovation. Promotes food systems based on agroecology, local resilience, and community-supported initiatives.
Expert J	Brazilian	Environmental justice, urban rights, participatory governance	Activist and academic working on the links between socio-environmental justice, urban policies, and participatory democracy. Encourages inclusive practices in ecological transition pathways.
Expert K	Belgian	Territorial development, circular economy, governance	Public sector leader driving regional development strategies. Led a major organizational transition to embed circular economy and sustainability at the heart of operations. Facilitates ecosystem-level initiatives.
Expert L	Belgian	Strategic consulting, territorial intelligence, participatory governance	Consultant supporting local authorities and businesses in sustainable territorial development. Promotes horizontal governance models and management approaches centred on autonomy and responsibility.
Expert M	Belgian	Eco-innovation, creativity, organizational transformation	Consultant and trainer helping organizations transition toward socioenvironmental responsibility. Focuses on creative capacity building and alignment with eco-innovation models.
Expert N	Belgian	Governance innovation, regenerative leadership	Facilitates corporate transition processes through participatory governance. Develops citizen-inclusive advisory boards, reflecting the inclusive and long-term focus of sustainable business model innovation.
Expert O	Belgian	Regenerative economy, sustainable food systems	Business leader committed to regenerative agriculture and localized food systems. Implements business models that combine ecological integrity with economic resilience across territories.
Expert P	Belgian	Circular economy, eco-innovation ecosystems, CSR strategy	Researcher and advisor coordinating cross-sector innovation around circular economy and climate resilience. Supports organizations in aligning strategy and structure with sustainable transformation goals.
Expert Q	Belgian	Regenerative leadership, sustainable transformation	CEO engaged in building regenerative business models and human-centred leadership practices. Advocates for purpose-driven innovation and long-term value creation aligned with societal needs.

(Continued)

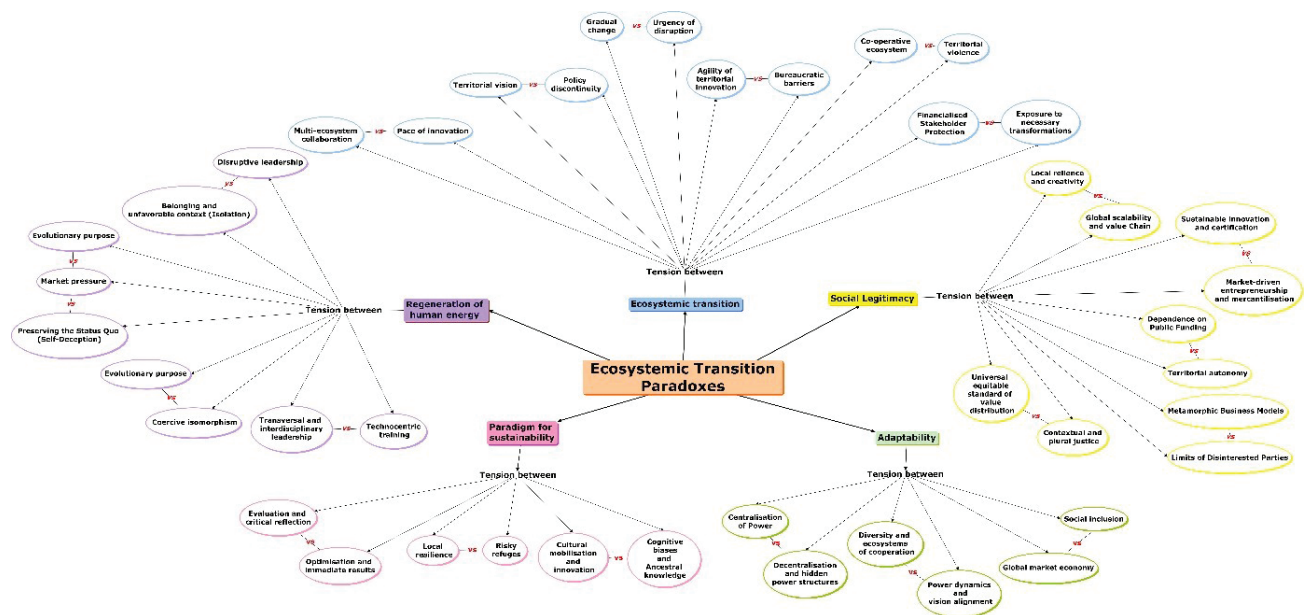
Appendix I (Continued). Profiles of Brazilian and Belgian experts

Interviewee	Nationality	Field of expertise	Experience
Expert R	Belgian	Digital, ecological, and organizational innovation	Consultant supporting businesses through ecological and technological transformation. Works on systemic alignment between business models, purpose, and ecological transition.
Expert S	Belgian	Digital commons, eco-innovation ecosystem	Researcher and speaker exploring peer-based innovation and commons-oriented production models. Offers a critical lens on value creation and governance for eco-innovation ecosystems.
Expert T	Belgian	Urban logistics, cooperative economy	Co-founder of a sustainable logistics initiative promoting modal shift and fair work conditions. Combines operational efficiency with systemic impact for urban sustainability.
Expert U	Belgian	Regenerative leadership, participatory governance	Founder of a consultancy and a platform focused on socio-ecological leadership. Develops collaborative frameworks to guide organizations through transitions aligned with sustainable business models.
Expert V	Belgian	Impact evaluation, business model innovation	Consultant in socio-ecological transition and business model transformation. Supports companies in assessing their sustainability impact and facilitating innovation ecosystems aligned with transition goals.

Source: own elaboration.



Appendix 2. Interview guide.
Source: own elaboration.



Appendix 3. A simplified overview of SBMI paradoxes.
Source: own elaboration.

Appendix 4. Connections between paradoxes and micro-foundations

Clickable link: [Experts_SBMI_Mf_Paradoxes.pdf](#)