Collaborative Innovation Ecosystems as Platforms for Sustainable Entrepreneurship: A Regional Case from Lappeenranta, Finland

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Abstract: Regional innovation governance plays a critical role in aligning economic development with sustainability objectives. According to Systems of Innovation theory, regional actors, including municipalities, research institutions, and businesses, form interconnected systems that shape the generation, diffusion, and commercialization of knowledge. Effective governance within these systems is essential for enabling regions to respond to societal transitions, including the shift toward green and circular economies. This paper explores how regional innovation ecosystems can serve as enablers of sustainable entrepreneurship and corporate development. Focusing on a pilot project led by the City of Lappeenranta, in partnership with Ikigaia and Servitium, and supported by Sitra, the study examines how cross-sectoral collaboration can be structured to address shared sustainability challenges and stimulate innovation in green growth sectors. Drawing on Innovation Ecosystem Theory and the Triple Helix Model, the research investigates how public, private, and academic actors co-develop governance models, pilot initiatives, and communication platforms that support entrepreneurship in emerging fields such as biomaterials, hydrogen (Power2X), and small modular reactors. The project's methodology includes stakeholder interviews, participatory workshops, and comparative benchmarking with other Finnish "InnoCities" to co-create new collaboration models. Through the lens of Stakeholder Theory, Collaborative Governance, and Dynamic Capabilities, the paper reveals how shared leadership and adaptive processes foster a culture of sustainable innovation. It also identifies persistent challenges such as fragmented funding, misaligned organizational timescales, and knowledge accessibility, offering actionable strategies to overcome them. The findings contribute to ongoing discourse on sustainable innovation governance by presenting a replicable and flexible model for ecosystem-based co-creation. It offers insights for local governments, innovation intermediaries, and corporate leaders seeking to align entrepreneurial activity with long-term environmental and societal objectives.

Keywords: Innovation ecosystems, Regional innovation governance, Sustainable entrepreneurship, Collaborative governance, Triple Helix model

1. Introduction

In the face of accelerating environmental degradation, technological disruption, and economic uncertainty, regions are increasingly called upon to act as engines of sustainability-oriented innovation (Jay and Gerard, 2015). As national governments decentralize responsibilities and global competition intensifies, cities and regions must harness the collaborative potential of their local innovation ecosystems to drive transformative growth (Braga and Souza, 2019). This imperative is particularly acute in small and mid-sized regions, where institutional coordination, stakeholder engagement, and strategic resource alignment are often underdeveloped yet critically needed (Andersson and Karlsson, 2004).

Innovation Ecosystem Theory provides a comprehensive lens for examining how diverse actors, public, private, academic, and civic, collaborate within territorially bounded systems to produce and diffuse new knowledge, technologies, and practices (Autio et al., 2018). Within this framework, innovation is not a linear process but emerges from dynamic, interdependent interactions among multiple organizations embedded in shared socio-economic and institutional contexts. The effectiveness of such ecosystems is determined not only by the presence of individual actors, but also by the quality of their linkages, trust relations, coordination mechanisms, and collective vision.

The Triple Helix Model (Etzkowitz & Leydesdorff, 2000) further sharpens this focus by conceptualizing the co-evolutionary relationships between academia, industry, and government. In this model, innovation emerges when the institutional spheres converge and take on hybrid roles; for example, universities becoming entrepreneurial, firms investing in basic research, and governments facilitating knowledge-intensive development. However, the model also warns that such convergence requires well-developed governance capabilities to manage institutional tensions and align divergent objectives.

In tandem, Stakeholder Theory (Freeman, 1984) underscores the normative and practical significance of inclusive governance. It posits that effective innovation systems must be accountable not only to economic actors but also to social and environmental stakeholders. This perspective is essential in sustainability-driven innovation, where societal legitimacy, environmental stewardship, and intergenerational equity must be balanced against short-term commercial objectives.

To operationalize such complexity, Collaborative Governance frameworks (Ansell & Gash, 2008) offer practical guidance on how multi-actor decision-making can be structured. These frameworks emphasize shared leadership, joint agenda-setting, and deliberative dialogue as foundations for cross-sector coordination. They are particularly useful in regional contexts where administrative fragmentation and institutional silos hinder the pursuit of collective goals.

Complementing these perspectives, the Dynamic Capabilities approach (Teece, 2007) explains how organizations develop the ability to sense opportunities, seize them through strategic alignment, and reconfigure internal and external competencies to sustain innovation over time. Within regional ecosystems, the distribution and activation of such capabilities are critical to ensuring not only participation but also absorptive capacity among smaller and less resourced actors.

This article applies this integrated theoretical framework to analyze the state of the innovation ecosystem in South Karelia, a Finnish region undergoing a green transition. Drawing on data from a 2025 regional survey and two collaborative workshops, the study investigates how public, private, and academic stakeholders perceive the current enablers and barriers to research, development, and innovation (RDI) collaboration. In doing so, it addresses three core questions: (1) What structural and relational features define the regional innovation ecosystem in South Karelia? (2) What mechanisms support or hinder cross-sectoral engagement in sustainability-oriented RDI activities? (3) How can governance models be redesigned to enhance the region's capacity for sustainable entrepreneurship and innovation?

By linking empirical findings to contemporary theoretical insights, the study contributes to a deeper understanding of how ecosystem governance can be made more inclusive, adaptive, and capable of addressing complex societal transitions.

2. Methodology

This study was conducted as part of Sitra's *Sustainable Growth Innovations* programme in Spring 2025 (InnoCities, 2025). The objective was to map the current state, achievements, and development needs of research, development, and innovation activities (RDI) in the South Karelia region of Finland. A mixed-methods approach was adopted, combining a region-wide quantitative survey with a qualitative stakeholder workshops to capture diverse perspectives across the innovation ecosystem.

2.1 Data Collection

2.1.1 Online survey

An online survey was conducted from May 8 to May 25, 2025, facilitated by the research agency Servitium. The survey targeted regional stakeholders across sectors, including private enterprises, public authorities, and academic institutions. A total of 1,826 personalized invitations were sent via email, resulting in 303 responses (response rate: 12%). Respondents included 210 representatives from the private sector, 62 from the public sector, and 31 from research or educational institutions. This balanced participation ensured that the perspectives of industry, academia, and the public sector were all reflected in the findings. The survey was also disseminated via the City of Lappeenranta's official channels to increase accessibility and reach. The questionnaire comprised both closed and open-ended items, enabling the collection of statistical data as well as rich qualitative insights.

2.1.2 Stakeholder workshops

Two workshops were conducted by innovation consultancy Ikigaia Oy to complement the survey findings and facilitate participatory scenario planning and idea generation. Workshop 1 (May 19, 2025) involved 15 participants from public sector organizations and higher education. The session included scenario-based group work focusing on strategic RDI priorities and practical collaboration models. Workshop 2 (June 2025) brought together a wider range of actors, including companies, city officials, and innovation intermediaries. The workshop emphasized the identification of concrete RDI pilot concepts, ecosystem-building, and scaling strategies. Discussions were structured around two key tasks: selecting priority development themes and co-designing actionable innovation experiments.

2.2 Data Analysis

The data collected in this study was analyzed and interpreted by external expert organizations commissioned for the project. Quantitative survey responses were processed and statistically summarized by Servitium Oy, a

professional research agency, using descriptive statistical methods, and results were sent to the participants of survey, including author. Qualitative data, transcripts from both stakeholder workshops, was analyzed thematically by Ikigaia Oy, which also facilitated the workshops. Their analysis focused on identifying recurring themes, stakeholder priorities, practical barriers to cooperation, and innovative proposals for enhancing RDI activities in the region. Thematic synthesis was structured around ecosystem development needs, strategic scenarios, and collaborative opportunities. The results of the analysis were acquired by the author via unstructured interview with representative of Ikigaia.

3. Results

3.1 Survey Results

3.1.1 Interest and opportunities in RDI

A notable outcome is that a majority of respondent organizations are open to expanding their RDI engagement. Over half (52.4%) of business respondents indicated they are willing to increase RDI collaboration in the future (only ~4% said "no," with the remainder uncertain). This suggests considerable untapped enthusiasm for joint innovation efforts. Furthermore, many respondents highlighted the benefits and successes already experienced through RDI activities in the region. Commonly cited positives included the establishment of trust, smooth communication, and committed partners, leading to naturally well-functioning cooperation between companies and universities. When projects had clear shared needs, well-defined goals and good planning, respondents felt roles, schedules and management were effective. RDI cooperation was seen to bring new perspectives and external expertise, yielding fresh ideas and solutions that "would not have emerged otherwise". In addition, initiatives like student thesis projects and open innovation challenges have produced tangible results. RDI was also credited with networking benefits, spawning new partnerships and inter-organizational networks, and with enabling projects via funding that made development work possible which "otherwise would not have been feasible". These successes underscore the opportunity for further leveraging RDI: the groundwork of trust, ideas and networks exists to build upon.

3.1.2 Key challenges and barriers

Despite the encouraging signs of willingness and interest in RDI engagement, the survey revealed a number of critical challenges that continue to hinder effective collaboration within the regional innovation ecosystem. These challenges are primarily structural and informational in nature and were especially emphasized by respondents from the private sector.

The most frequently cited obstacle was the lack of awareness about existing RDI opportunities and relevant actors in the region. Approximately 45% of respondents indicated that companies—particularly small and medium-sized enterprises—remain largely uninformed about available programs, funding instruments, or potential collaboration partners. This informational asymmetry significantly limits the ability of firms to engage in joint research or innovation initiatives. Secondly, around 37% of respondents reported misalignment of schedules and resource constraints as a barrier. Many companies, especially smaller ones, struggle to allocate the necessary time and personnel to participate in RDI projects, which often require sustained involvement over extended periods. These resource mismatches make it difficult for firms to commit to collaborative processes, even when the strategic value of participation is recognized.

Another widely noted issue was the excessive administrative burden associated with publicly funded RDI projects. About 36% of participants highlighted bureaucratic complexity as a major impediment, arguing that administrative tasks often divert focus from core development work. Respondents called for a significant simplification of funding procedures and reporting requirements. A further challenge relates to the difficulty in identifying suitable partners for collaboration, reported by approximately 28% of survey participants. Fragmentation within the regional ecosystem and limited matchmaking services have resulted in missed opportunities for synergy, particularly between industry and academia.

In addition, weak communication and outreach towards companies was identified by roughly 25% of respondents. The dissemination of information about RDI initiatives, success stories, and potential engagement channels was perceived as insufficiently targeted or accessible, underscoring the need for improved dialogue between innovation actors. Approximately 21% of participants also pointed to unclear or poorly defined goals in joint projects as a barrier to effective cooperation. When objectives are misaligned or inadequately articulated, mutual trust and commitment tend to deteriorate, ultimately compromising project outcomes. Lastly, a smaller but still significant segment—around 12%—expressed a lack of perceived need for

RDI within their organizations. These respondents did not view RDI collaboration as directly beneficial or strategically necessary, reflecting either a disconnect between innovation discourse and everyday business realities or limited prior exposure to positive RDI experiences.

Together, these findings highlight the need for more structured, transparent, and user-friendly collaboration mechanisms that lower entry thresholds and foster trust among regional innovation actors. Addressing these barriers is essential to unlocking the full potential of South Karelia's innovation ecosystem.

3.1.3 Support needs

When asked how to improve the accessibility and effectiveness of RDI, stakeholders across all sectors highlighted the need for clearer information, simplified funding processes, and better partner matchmaking. SMEs and solo entrepreneurs, in particular, expressed frustration with the complexity of existing innovation programs, describing them as opaque and burdensome. Many emphasized the value of hands-on guidance and low-threshold support, someone to explain processes in plain terms and walk them through engagement steps.

There was strong demand for more agile and business-friendly RDI models that prioritize outcomes over paperwork. Respondents suggested lighter application procedures and pilot-focused funding accessible even to micro-enterprises. Overall, the message was clear: the region has strong RDI capacity and willingness, but activating it requires better coordination and a shared commitment to lowering participation barriers.

Each sector brought distinct perspectives to these shared concerns. Private sector respondents (especially from SMEs) highlighted the potential of RDI collaboration, but stressed the need for models that are agile, transparent, and business-oriented. They want partnerships grounded in real-world problems, quick to show results, and free from excessive bureaucracy. Trust, equal-footing collaboration, and relevance to company needs were central priorities. As one noted, "I hope for a model where universities, the public sector and companies genuinely work side by side."

Public sector actors, including municipalities, focused on clearer communication, low-threshold participation mechanisms, and stronger coordination. They emphasized that innovation efforts should respond to genuine business needs and be better integrated into everyday public services. Fragmented initiatives and competitive models were seen as counterproductive; instead, a unified platform for cooperation and inclusive participation was encouraged. Academic institutions echoed the need for transparency and coordination, advocating for a centralized "one-stop shop" for RDI information and partner discovery. They stressed the importance of long-term partnerships over one-off projects, and called for greater integration of students and startups into the ecosystem. Academic actors also pointed to a critical gap in early-stage funding, suggesting the creation of seed mechanisms or "validation pipelines" to help promising ideas reach commercial viability.

3.2 RDI Workshop Outcomes

3.2.1 Strategic RDI themes for the region

Through facilitated scenario exercises and discussions (guided in part by Ikigaia's innovation experts and Sitra's foresight input), the workshops converged on a set of strategic spearhead themes that leverage South Karelia's strengths and respond to future opportunities. Three priority themes were highlighted for the region's RDI-driven growth over the next decade.

First, embracing the green transition, South Karelia should focus on technologies for carbon neutrality in industry. This includes initiatives in CO_2 capture and utilization and Power-to-X solutions (e.g. using captured carbon with renewable energy to create fuels or materials). Developing climate-friendly industrial processes and expertise (such as modular hydrogen and novel bioenergy systems) can position the region at the forefront of sustainable industry.

Second, building on the local pulp, paper, and bioeconomy legacy, the region aims to innovate in new bio-based materials and the circular economy. For example, participants identified opportunities in agricultural fibers and bio-based plastics (Bio-PE) production, as well as creating EU-compliant fiber products for textiles and packaging. By valorizing local biomass and waste streams into high-value materials, South Karelia can become a hub for sustainable biomaterials innovation.

To translate innovations into practice, the region needs an infrastructure for large-scale demonstration. The workshops proposed establishing a pre-commercial pilot testing platform attached to LUT University. This would be an RDI hub where new technologies (e.g. in clean energy or process industry) can be tested and

validated in an industrial setting. Such an environment would connect research, rapid prototyping, and investor involvement in one physical/virtual space. It effectively provides a bridge from lab to industry – enabling scale-up of promising innovations locally.

These three themes were seen as interrelated pillars of a regional innovation strategy. They align with broader European trends and funding priorities (e.g. the EU Green Deal emphasis on climate tech and circular economy), while also capitalizing on South Karelia's existing capabilities. Focusing RDI efforts around these domains could give the region a distinctive competitive edge and attract talent and investment into the area.

3.2.2 Identified bottlenecks in the ecosystem

The workshops also openly confronted the bottlenecks and pain points that were impeding RDI collaboration, many of which mirrored the survey findings, namely: fragmentation of collaboration, uneven participation and resource gaps, and lack of agility and experimental culture. Participants agreed that the regional innovation landscape was too fragmented and project-based, relying heavily on individual short-term projects or personal networks. There is a lack of coordinated, systemic collaboration. This siloed approach prevents scaling up good ideas, successful pilots often remain one-offs, and knowledge isn't widely shared.

It was noted that SME involvement in RDI is relatively weak, leading to an imbalanced ecosystem. RDI activities tend to concentrate in a few larger organizations or specific sub-regions, which undermines inclusivity and broad-based impact. Smaller companies and outlying communities struggle to engage, often due to limited resources or awareness, creating an "innovation divide." This uneven distribution of expertise and RDI capacity means much potential talent and many ideas remain untapped.

Current collaboration and funding models are seen as too rigid and slow to respond to emerging ideas. The workshops flagged a shortage of agile, experimental approaches - "current operating models do not support rapid ideation and piloting". New funding mechanisms and more flexible processes are needed to allow quick trials of innovative concepts to meet local needs.

In addition to these general issues, the voice of student entrepreneurs (LUTES) in the second workshop shed light on specific bottlenecks faced by startups and young innovators. From the LUTES and student perspective, entry into the RDI ecosystem is particularly challenging. They reported that support for startup teams is fragmented and "invisible". As a result, student entrepreneurs spend excessive time just trying to locate the right mentor or funding source, since there is no clear matchmaking system. Another issue is that typical RDI or research projects are far too heavy for small student-led ideas – the threshold to join formal projects is high. This leaves early-stage student innovations in a void, unable to access RDI resources until they've matured (by which time some have already left the region). Compounding this is the "campus bubble" effect: many student teams have no contact with local companies, development companies, or the city government. Lastly, the students highlighted a critical funding gap at the very start of the innovation journey: from idea to prototype (MVP), there is "no sufficient low-threshold funding mechanism" available in the region.

3.2.3 Co-Developed solutions and initiatives

Both workshops prioritized brainstorming solutions to the above challenges. Participants collectively proposed a range of measures, from structural fixes to new collaborative platforms and pilot projects. Some of the key solutions that emerged included "Warm Gateways" for startups into RDI, clear path from idea to pilot to customer, "One-Stop Shop", improved RDI Visibility and information sharing, flexible funding and support mechanisms,

To lower barriers for startups and small firms, the idea of establishing easy entry points was championed. This means creating simple, low-bureaucracy mechanisms for startups to engage in RDI activities. For example, the group envisioned a program or office that proactively welcomes early-stage innovators offering them a streamlined process to pitch ideas, join ongoing projects, or get seed support without the usual formalities.

Hand-in-hand with the above, the workshops stressed designing a clear pipeline that guides innovators from the concept stage through pilot testing to first reference customers. Currently, many ideas fall into cracks between stages. Participants suggested mapping out and actively supporting this trajectory: for instance, after a student or SME develops a prototype, there would be a defined route to connect them with a pilot opportunity (perhaps at a local company or testbed), and then to an early adopter customer (even the city could serve as a "first customer" for local innovations). Importantly, the City of Lappeenranta was urged to take an encouraging role.

A recurring proposal was to establish a common platform or hub organization that links all the actors in continuous collaboration. This would go beyond one-off networking events: the vision is a permanent collaborative forum (physical, digital, or both) acting as the region's innovation nexus. Such a hub could host regular meetups, maintain an up-to-date database of who is doing what, and broker partnerships in real time. Essentially, it implements the "one clear forum" concept requested in the survey, breaking down silos between academia and business.

To address the information deficit, participants called for dramatically increasing transparency about ongoing and past RDI projects in the region. They proposed creating a shared information repository that would answer questions like: What projects are happening? Where can one participate? Where are fresh ideas needed? Likewise, this repository or database should document past project: what has been tried in South Karelia, what succeeded, and what failed, so that lessons aren't lost and new entrants can learn from history. In practice, this could tie into the above one-stop platform as an online portal listing active RDI and a library of case studies. More robust outreach and communication was also emphasized.

Responding to the need for agility, the workshops discussed experimenting with new funding models to support quick trials. Ideas included a "regional RDI micro-grant" scheme for prototyping and a shared seed fund or accelerator targeting student and researcher-founded startups. The notion of a "validation pipeline" was raised, wherein promising early-stage concepts get a small pot of funding to produce a proof-of-concept, and successful ones then connect to larger investors or national program. Another idea was to set up a consortium-based mentoring and funding network (a kind of local innovation fund) that draws contributions from multiple channels (public, private, EU) to de-risk investment in regional pilots.

Several pilot projects were also brainstormed as concrete next steps. For instance, one pilot concept was a "reference ecosystem" in a specific domain: focusing on a few high-potential clean-tech innovations and fast-tracking them through local pilot use to global markets, supported by a novel regional fund. Another pilot idea was an "investment attraction program" that would package a set of regional pilot projects (in e.g. hydrogen or bio-based materials) to pitch to external funders and industrial investors as a bundle – thereby drawing in capital and partners from outside the region. The role of LUTES was also considered in implementation: the student entrepreneurs made it clear that they are ready to act as bridge-builders, e.g. by providing course assistants for RDI projects, organizing hackathons or innovation challenges, and mobilizing student teams for pilots, but they need to be invited as equal partners in planning, not just used in execution.

3.2.4 Visionary goals and future outlook

Beyond immediate fixes, the workshops fostered a shared long-term vision for South Karelia's RDI ecosystem. The region aspires to become a national and European "sustainable industry forerunner", recognized for pioneering clean technologies and circular economy solutions. Participants envisioned a thriving Triple Helix collaboration, where universities, companies, and public agencies work hand-in-hand to create an agile growth platform for developing, testing, and scaling innovation.

To reach this future, bold and differentiating initiatives are needed. One such proposal is a "world-class unique growth environment" that brands South Karelia as a global innovation cluster. A key feature would be a modular RDI platform for industrial production: a flexible system that can rapidly test and scale innovations from biofuels to AI-enabled manufacturing helping to bridge the "scaling up" gap for deep-tech.

Another cornerstone of the vision is forming strong international partnerships. By linking to EU flagship programs and top universities, the region's innovators can access global funding and expertise, keeping South Karelia at the cutting edge.

Ultimately, this vision positions Lappeenranta as a launchpad for globally competitive startups that address sustainability challenges. The workshops provided more than tactical ideas, they offered a strategic direction.

4. Discussion and Conclusion

This study contributes to the evolving discourse on regional innovation governance by offering an empirically grounded case of how South Karelia, a mid-sized Finnish region, is reimagining its innovation ecosystem to support sustainable entrepreneurship. Using an integrated framework of Innovation Ecosystem Theory, the Triple Helix Model, Stakeholder Theory, Collaborative Governance, and Dynamic Capabilities, the research highlights both structural barriers and emerging opportunities.

The study findings, drawn from surveys and participatory workshops, reveal a strong but underutilized RDI capacity in the region. While there is considerable interest in cross-sectoral collaboration, the full potential of ecosystem-driven innovation is constrained by fragmentation, information gaps, and limited coordination mechanisms.

4.1 Structural Weaknesses in Ecosystem Coordination

The research affirms that innovation activity in South Karelia is often dominated by public and academic institutions, while private-sector engagement—especially from SMEs and startups—remains sporadic. Innovation efforts tend to be siloed and project-based, lacking systemic coordination or shared platforms. As previous studies have noted (Autio et al., 2018; Tödtling & Trippl, 2005), ecosystems without integrative institutions often fail to achieve sustained impact. South Karelia's lack of a unified RDI hub limits inclusivity and system-level functionality.

4.2 Emerging Alignment with Collaborative Governance and Triple Helix Models

Despite these structural gaps, the study also captured a nascent shift toward collaborative governance and Triple Helix integration. The co-creative workshops initiated inclusive agenda-setting and the design of hybrid institutional models, such as a modular piloting platform and a shared RDI portal. These efforts indicate growing alignment with the principles of joint leadership, hybrid roles, and ecosystem openness, suggesting the emergence of governance capabilities necessary for systemic innovation.

4.3 Dynamic Capabilities and Innovation Readiness

The concept of dynamic capabilities (Teece, 2007) helps explain the region's latent innovation potential. While key actors possess individual strengths, the region lacks coordinated pathways to sense, seize, and scale innovation opportunities. Survey findings highlight strong willingness among firms to engage in RDI, but also point to complex funding landscapes and the absence of "idea-to-impact" pipelines. Proposed initiatives such as public procurement for regional innovations and early-stage pilot support aim to build this dynamic capability infrastructure.

4.4 Gaps in Inclusive Governance

From a Stakeholder Theory perspective, the current governance model only partially integrates marginalized or under-resourced actors, such as micro-enterprises, student entrepreneurs, and peripheral communities. Workshop insights, especially from LUTES representatives, underscored the high entry barriers these groups face: from unclear mentorship pathways to funding voids for early-stage innovation. These gaps challenge the normative principle that all stakeholders should be empowered to co-create the innovation processes that shape their futures.

4.5 Toward a Replicable Model for Sustainability-Driven Innovation

Despite persistent bottlenecks, South Karelia's pilot initiative demonstrates a credible pathway toward a replicable, mission-oriented innovation model (Mazzucato, 2018). The region's strategic focus on carbon-neutral industry, biomaterials, and piloting infrastructure aligns well with both EU Green Deal priorities and local strengths. Notably, the workshops catalyzed actionable proposals: an inclusive RDI hub, agile funding mechanisms, and stronger links between academia, industry, and government. These reflect a broader reconceptualization of innovation as a systemic, inclusive, and purpose-driven endeavor.

4.6 Final Reflections

This study illustrates that small and mid-sized regions can play a pivotal role in sustainable innovation if they invest in inclusive governance, dynamic collaboration models, and responsive support structures. The South Karelia case extends theoretical frameworks into a real-world context, showing how deliberate ecosystem-building—rooted in shared leadership and adaptive governance—can activate untapped potential.

Practically, the research suggests that lowering participation thresholds, coordinating support, and fostering a culture of rapid experimentation are critical to mobilizing diverse actors. The strong engagement of stakeholders—from student entrepreneurs to municipal leaders—during this project bodes well for future efforts. If the region sustains this momentum and institutionalizes its emerging governance models, it is well-positioned to become a model innovation cluster for sustainability transitions in Europe and beyond.

Ethical declaration: All participation was voluntary and anonymous, with respondents and interviewees informed about the study's aims and the use of collected data. The representativeness of survey responses

across sectors and the inclusion of expert reflection through interview support the validity and reliability of the findings. The dual-sourced methodology enabled both breadth and depth in capturing the region's RDI dynamics.

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