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Beyond the Entrepreneurial University: Regenerative Innovation in University Ecosystems

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Abstract: This paper examines the limitations of dominant growth-oriented innovation models in university ecosystems and explores the potential of regenerative business as an alternative conceptual lens. While universities are increasingly expected to address grand societal challenges, their innovation practices remain largely embedded in market-driven logics prioritising competitiveness, scale, and short-term impact. Drawing on the emerging literature on regenerative business, this study develops a conceptual framework for regenerative innovation in university ecosystems. The research adopts a qualitative, theory-building multiple case study design, combining analysis of strategic documents and semi-structured interviews across selected university ecosystems in Europe and Latin America. The paper identifies key tensions between extractive and regenerative innovation logics and proposes a framework structured around value regeneration, long-term stewardship, and place-based embeddedness. It contributes to innovation management by extending regenerative thinking to university ecosystems and offering an alternative approach to organising and evaluating innovation processes..

Keywords: Regenerative innovation; Regenerative business; University ecosystems; Entrepreneurial University; Sustainability transitions; Mission-oriented innovation; Responsible research and innovation; Socio-ecological systems; Place-based innovation; Innovation systems.

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1 Introduction

Over the past three decades, innovation in university ecosystems has been dominated by paradigms of economic growth, technological competitiveness, knowledge commercialisation, and impact maximisation. Implementing their 'third mission', universities have increasingly become entrepreneurial actors: they produce start-ups and spin-offs, patents, licenses, and other technology transfer outputs that generate important benefits to regional economic development. At the same time, this model has also induced a progressive reorientation of university education and research towards market-driven priorities, whereby commercialisation logics increasingly shape academic agendas, governance structures, and performance criteria, often at the expense of long-term public knowledge creation and societal gains. An overemphasis on economic value and short-term project logics driven by funding cycles often left limited room for consideration of social, ecological, and institutional sustainability.

This evolution has been described in dominant theoretical frameworks such as the Entrepreneurial University and the Helix models (Triple/Quadruple) and innovation (eco)systems models, which frame innovation primarily as a mechanism for enhancing productivity, competitiveness, and market-based value creation. These frameworks remain largely anchored in a growth-oriented logic**,** where success is often measured in terms of short-term outputs, scale, and competitiveness, and insufficiently addresses systemic socio-ecological challenges such as social inequality, climate change and the long-term regeneration of socio-technical systems.

From an innovation management perspective, this structural and systemic transformation creates a fundamental contradiction: universities are simultaneously tasked with contributing to 'grand challenges', 'mission-oriented' and 'transformative' innovation for sustainable transitions, while operating within governance and incentive systems that reward speed, scale, and commercial performance under market pressures, without adequate conceptual tools to guide alternative innovation pathways. As a result, innovation activities often generate unintended consequences such as mission drift, weak local embeddedness, and limited capacity for systemic institutional renewal.

Existing models explain how universities can innovate more, faster, and more competitively, but provide little guidance on how innovation processes might actively renew and strengthen the social, ecological, and institutional conditions on which future innovation depends. The concept of regenerative business, relatively recently developed within sustainability and management studies as a more radical alternative to conventional sustainability thinking, may offer some relevant insights, and could be used as a new analytical lens to reframe the role of universities in innovation systems beyond commercialisation and impact metrics. However, this concept has remained almost entirely confined to private firms,

sustainability entrepreneurship, and ecological business models, with virtually no systematic application to universities as innovation actors.

In this context, the paper explores the relevance of the regenerative business concept in the context of university ecosystems and aims to develop a conceptual framework capable of reorienting university-driven innovation away from growth logic and towards regenerative societal transformation. The research is guided by an overarching research question: **How can the concept of regenerative business be extended to university-driven ecosystems and operationalised for understanding and managing innovation processes in this environment?** Three sub-questions emerge from this main question:

1. How do the core principles of regenerative business differ from dominant growth-oriented innovation models?
2. How do existing university innovation practices align with, or contradict, regenerative principles?
3. What would a regenerative innovation framework imply for the governance, design, and evaluation of university ecosystems?

2 Literature review

The role of universities in innovation has been extensively theorised in the literature on the Entrepreneurial University and Triple/Quadruple Helix (Etzkowitz and Leydesdorff, 2000; Ranga and Etzkowitz, 2013; Carayannis and Campbell, 2009), which conceptualise innovation as the outcome of dynamic interactions between universities, industry, government, and later, civil society. These frameworks have been highly influential in shaping both academic research and policy practice, particularly in Europe and OECD countries, where they underpin strategies for regional development, technology transfer, and knowledge-based growth.

More recent scholarship has sought to normatively reorient innovation toward broader societal goals by expanding collective deliberation, accountability, and public value through concepts such as Responsible Research and Innovation (RRI) (Stilgoe, Owen, and Macnaghten, 2013) and mission-oriented innovation policy (Mazzucato, 2018), which emphasise societal challenges, public value, inclusiveness, and directionality. These approaches shift from market-driven innovation, highlighting the role of the state, public institutions, and collective goal setting in shaping technological trajectories.

However, despite their critical ambitions, both RRI and mission-oriented frameworks do not fundamentally break with the traditional, growth-oriented innovation paradigm. They remain largely embedded in instrumental and performance-oriented policy logic, focusing on governance mechanisms, stakeholder engagement, and portfolio management rather than on the underlying political economy of innovation systems themselves. In practice, they often coexist with - rather than displace - growth-centric metrics and competitive

funding regimes. As a result, they do not offer mechanisms capable of supporting firms transitioning toward genuinely regenerative business models, which require socio-ecological restoration, long-term stewardship, and multi-stakeholder collaboration rather than efficiency-based impacts (Konietzko et al., 2023). Moreover, these frameworks provide little guidance on how universities should relate to, collaborate with, or enable regenerative businesses—particularly regarding the organizational interfaces, relational routines, and governance arrangements necessary to operationalize regenerative transitions.

The concept of regenerative business developed within sustainability and management studies as a more radical alternative to conventional sustainability thinking has gained visibility over the past 10–15 years, drawing on longer-standing traditions in ecology, systems thinking, and alternative economics (Whiteman, Walker and Perego, 2013; Fullerton, 2015; Ryan, 2023; Salonen et al., 2024). Rooted in dissatisfaction with the limits of sustainable development, Corporate Social Responsibility, and the climate-emergency discourse, regenerative approaches contend that organizations should move beyond profit maximization, harm reduction, and efficiency to actively regenerate social and ecological systems through core principles, such as:

- *Restoration:* actively repairing ecological and social systems
- *Reciprocity:* creating mutual value across stakeholders
- *Resilience:* strengthening system adaptability over time
- *Place-based embeddedness*: aligning activities with local contexts

In this sense, regenerative businesses have a purpose on enhancing social wellbeing and generating positive impacts for society and ecological systems, which requires moving beyond narrow business-centric interpretations of regeneration toward a holistic socio-ecological systems logic (Hahn & Tempe, 2021). Regenerative value creation thus goes well beyond minimizing environmental risks and depends on coordinated stakeholder engagement and systemic capabilities such as reducing, repurposing, and substituting materials (Bocken et al., 2014).

However, regenerative businesses literature (Konietzko et al., 2023) remains largely confined to private firms and ecological business models, with virtually no systematic application to universities as ecosystem actors. Because regenerative technologies rely heavily on scientific knowledge, experimentation, and translational capacities typically housed in universities, the weak articulation between regenerative ventures and academic institutions constitutes a significant and under-explored gap. The literature thus remains theoretically fragmented and normatively inconsistent: while universities are increasingly positioned as agents of societal transformation, the dominant innovation models still reproduce extractive logics inherited from industrial and market-centric paradigms. This conceptual gap motivates the need for a regenerative innovation framework capable of rethinking how innovation in university ecosystems is organised, governed, and evaluated. This is what this paper sets out to achieve.

3 Research methodology

3.1 Research design

This study adopts a qualitative, theory-building research design aimed at developing and refining a conceptual framework for regenerative innovation in university ecosystems. Given the exploratory nature of the research and the limited prior application of regenerative concepts in this context, a qualitative approach is appropriate to capture complexity, contextual variation, and emerging patterns. More specifically, the study employs a multiple case study design (Eisenhardt, 1989; Yin, 2018), which allows for the systematic comparison of different university ecosystems and supports the development of analytically generalisable insights. The goal is not statistical generalisation but theoretical elaboration and refinement.

3.2 Case selection

Cases are selected through theoretical sampling, with the aim of capturing variation in how university ecosystems engage with sustainability and innovation practices. The selection follows three criteria:

1. *Active innovation ecosystem*: presence of innovation structures such as incubators, living labs, or collaboration platforms
2. *Engagement with sustainability or societal challenges:* involvement in initiatives related to sustainability transitions, social innovation, or mission-oriented programmes
3. *Geographical diversity*: inclusion of cases from both European and Latin American contexts to capture different institutional environments

A small number of cases (3-4) is selected to allow for in-depth analysis, while still enabling cross-case comparison.

3.3 Data collection

The study combines primary and secondary data sources to ensure triangulation and robustness.

- *Primary data* will be collected through semi-structured interviews with key stakeholders, including university leadership and innovation managers; researchers involved in sustainability-related initiatives; and external partners (e.g. industry, public sector, civil society organisations). These interviews aim to capture perceptions, practices, and organisational dynamics related to innovation and sustainability.
- *Secondary data* will be collected from **s**trategic documents (e.g. university strategies, sustainability plans), policy reports and programme descriptions, and publicly available information on innovation initiatives and partnerships. These sources provide insight into formal structures, priorities, and declared objectives.

3.4 Analytical strategy

Data analysis will follow a hybrid coding approach, combining deductive and inductive elements:

- *Deductive coding* is based on core regenerative principles identified in the literature (restoration, reciprocity, resilience, place-based value)
- *Inductive coding* allows for the identification of emergent themes and practices not captured by existing frameworks

The analysis will proceed in three steps:

1. *Within-case analysis*: identifying how regenerative principles are reflected (or absent) in each case
2. *Cross-case comparison:* identifying patterns, similarities, and divergences across cases
3. *Theoretical abstraction:* refining and elaborating the regenerative innovation framework based on empirical insights

3.5 Operationalisation of 'Regenerative Innovation'

To enable empirical analysis, the concept of 'regenerative innovation' is operationalised across three dimensions:

- *Socio-ecological value creation*: extent to which innovation activities contribute to social inclusion, environmental restoration, and public value
- *Temporal orientation:* balance between short-term outputs and long-term system transformation
- *Spatial embeddedness:* degree of alignment with local contexts and communities

These dimensions provide analytical lenses for assessing the extent to which university innovation practices align with regenerative principles.

3.6 Validation and research quality

The study ensures robustness through:

- *Data triangulation* across interviews and documents
- *Iterative comparison* between empirical findings and theoretical constructs
- *Analytical generalisation,* focusing on theory development rather than representativeness

This approach enhances the credibility and transferability of the findings while remaining consistent with the exploratory nature of the research.

4 Expected results

The paper is positioned as a theory-building and agenda-setting contribution, having as main outcome the development of a regenerative innovation framework for university ecosystems, structured around three core dimensions:

1. From value extraction to value regeneration

Innovation is redefined as a process that generates social, ecological, and institutional value, rather than primarily economic returns.

2. From short-term performance to long-term stewardship

Innovation processes are oriented towards long-term system resilience, incorporating practices such as living labs, citizen engagement, and experimental governance.

3. From global scalability to place-based embeddedness
Innovation is understood as place-based and territorially embedded, responsive to local needs, and co-created with communities.

The findings have practical implications for several stakeholder groups:

- *University leaders and innovation managers* gain a framework for redesigning innovation strategies beyond KPIs such as patents and spin-offs, towards long-term societal value and ecosystem resilience.
- *Policymakers* can use the regenerative innovation lens to rethink funding schemes, evaluation criteria, and mission-oriented programmes.
- *Researchers and students* benefit from a new conceptual vocabulary to critically reflect on their role within innovation systems.
- *Local communities and civil society organisations* gain greater legitimacy as co-producers of innovation, rather than passive beneficiaries.

Overall, the paper suggests that regenerative innovation offers a strategic alternative for universities navigating the tensions between entrepreneurship, sustainability, and societal responsibility in the context of systemic global crises.

Thus, the paper contributes to innovation management theory in three main ways:

- *Introducing **'regenerative innovation'** as a novel conceptual category,* extending the regenerative business concept to the domain of university-driven innovation (eco)systems
- *Providing a critical re-theorisation of the Entrepreneurial University***,** challenging growth-centric assumptions and offering an alternative perspective for university innovation.
- *Bridging fragmented literatures on university ecosystems, sustainability, innovation governance, socio-technical systems, etc.* offering an integrative framework that shifts the focus of innovation management from "how to innovate more effectively" to "how to innovate in ways that regenerate the conditions for future innovation."

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