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# Understanding levers and barriers of the emergence and persistence of emerging rural circular biocluster initiatives: Case of Occitanie region in the south of France

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## INTRODUCTION

The shift towards a circular bioeconomy has fostered the emergence of **rural circular bioclusters**. These collaborative projects aim to bring together diverse stakeholders in rural communities to promote sustainable resource management, value creation, and social well-being. However, despite their immense potential, the success of these bioclusters depends on **understanding the key factors that influence their development and long-term viability**.

## 1- KEY CONCEPTS

- A **biocluster** is a certain type of sustainability-oriented cluster, composed of a geographically close group of interconnected companies and associated organisations in the field of the bioeconomy (Ayrapetyan and Hermans, 2020).
- The **viability** of an emerging regional biocluster is its ability to maintain, innovate, co-create and share value while respecting the environmental limits and taking into account the social issues of the area in which it is located (own definition).

## 2- OBJECTIVE

Propose an **analytical framework for assessing the viability of emerging rural bioclusters** in the Occitanie region, located in the south of France.

### Bibliography :

- Anderies J. M., Mathias J.-D., Janssen M.A. (2019) Knowledge infrastructure and safe operating spaces in social-ecological systems. Proc Natl Acad Sci USA. 2019 Mar 19;116(12):5277-5284. doi: 10.1073/pnas.1802885115.
- Ayrapetyan, D., Hermans, F., 2020. Introducing a multiscale framework for biocluster research: a meta-analysis. Sustainability 12 (9), 3890. <https://doi.org/10.3390/su12093890>.
- Donner, M. and Al., (2021). Critical success and risk factors for circular business models valorising agricultural waste and by-products. Resources, Conservation and Recycling, 165, 105236.
- Salvador, R., and Al., (2022). How to advance regional circular bioeconomy systems? Identifying barriers, challenges, drivers, and opportunities. Sustainable Production and Consumption.

## 3- METHODOLOGY

- An **analytical framework** based on a literature review from bioeconomic business models, clusters, the circular economy, supply chains and proximity analysis.
- **Case studies**, in the form of semi-directive interviews.



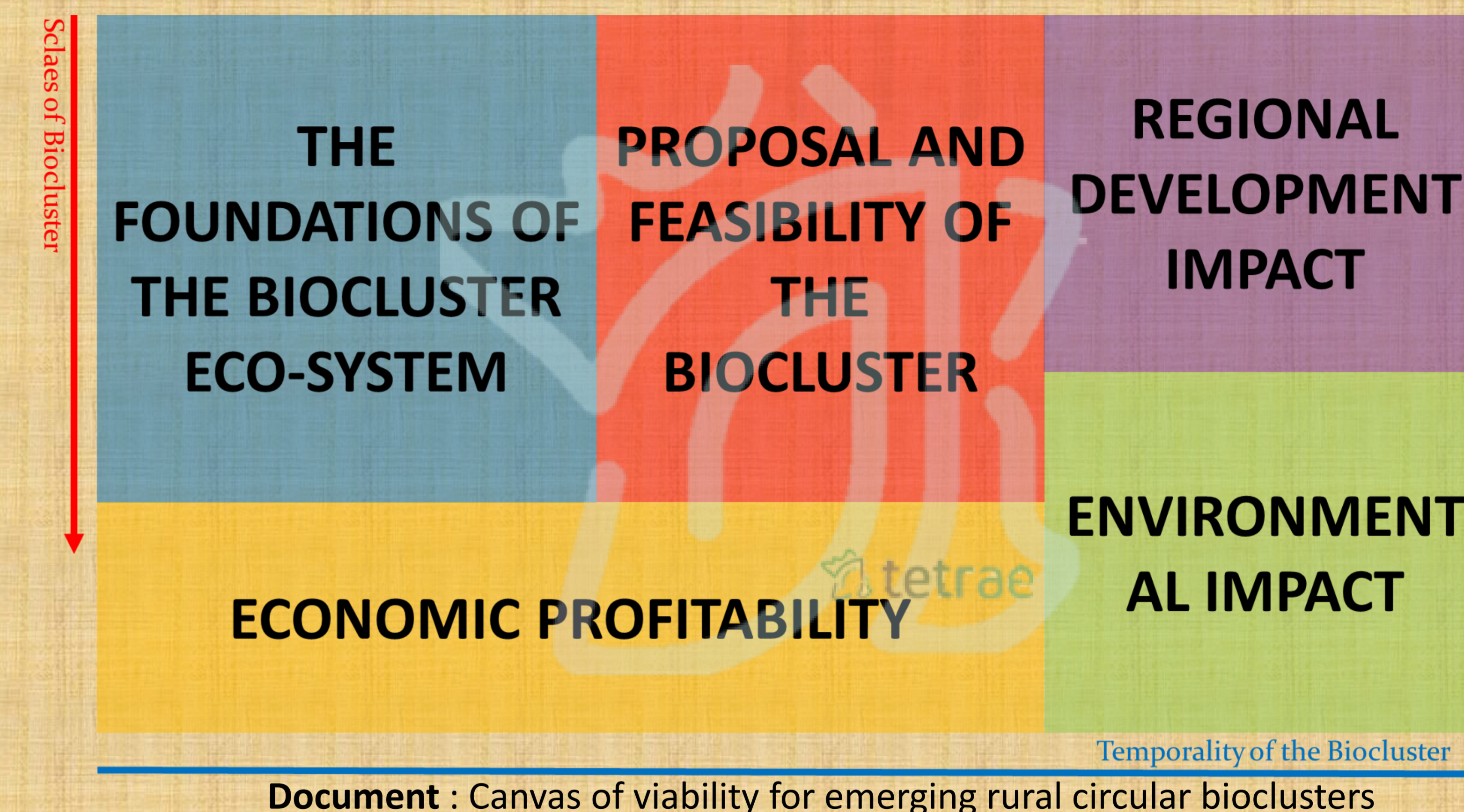
Photos : Example of structures surveyed (from right to left) :

## 4- RESULTS

The factors influencing the trajectory and long-term success of bioclusters are not isolated entities, but rather **interconnected elements** that can act as either levers (enablers) or barriers (challenges) (Donner, M. et al., 2021) . These factors can have opposing effects depending on the specific context which relates "**safe operating spaces**" (Anderies et al. 2019).

Factors	Levers (Enablers)	Potential Opposing Effects (Barriers)
Organizational	Strong leadership	Excessive control
	Clear common rules	Rigid rules
Economic, Financial & Marketing	Access to funding	Dependence on external funding
	Competitive bio-based products	High production costs
	Market opportunities	Short-term profit focus
Institutional & Legal	Public subsidies	Overreliance on subsidies
	Supportive regulations	Overly complex regulations
Technical & Logistical	Acquisition of skills and tools	High costs
Socio-Territorial	Successful cooperation	Lack of diversity or inclusion
	Socio-geographical proximity	Difficult to set up self-control

Table : the opposing effects of key levers and barriers of biocluster in Occitanie



Document : Canvas of viability for emerging rural circular bioclusters

## 5- DISCUSSION AND CONCLUSION

This research explores the factors that foster and impede the development of rural circular bioclusters. By understanding these dynamics, stakeholders can leverage bioclusters for regional **economic growth, environmental stewardship, and social revitalization**.

### Key Findings:

- **Territory as Enabler:** Rich local history, abundant resources, and skilled workforces create a strong foundation for bioclusters. Local market focus further bolsters long-term sustainability.
- **Proactive Environmental Integration Needed:** While the environmental benefits are recognized, a more proactive approach to integrating environmental practices into biocluster strategies is crucial.

### The Biocluster Viability Canvas: A useful tool

To address these challenges, we developed the Emerging Rural Circular Bioclusters Viability Canvas. This multi-criteria tool empowers regional leaders to assess their initiatives through a comprehensive business model evaluation.