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# Territory and Governance of Circular Bioeconomy Projects – The Case of Pomegranate Juice By-product Valorization in Southern France

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## Abstract

The quest for independence from fossil resources entails, notably, an increased reliance on biomass, in other words, expanding its non-food uses, which in turn intensifies competition with its food uses (Bobulescu, 2015). Overcoming this tension between intensification and the competition of food and non-food uses seems to involve implementing cascading valorization, particularly of waste and organic by-products from agricultural and agro-industrial activities. The realization of this technical "solution," which allows for the superimposition of multiple complementary valorizations, requires reorganizations of the productive system, particularly by linking the agricultural and agro-industrial sectors with a new diversity of industries (Colonna et al., 2020; Girard, 2022). From one territory to another, the reorganizations induced by cascading valorization vary and locally produce new productive systems with characteristic governance and performance (Benoit, 2021; Donner et al., 2020). While this diversity is well-studied, it remains to understand what has produced it in the territories, particularly the material and immaterial resources necessary for its emergence.

Based on Torre's work on territorial development (Torre, 2023), this article explores the connections between proximity relations, stakeholder behaviors according to Hirschman's model (Exit, Loyalty, Voice) (Hirschman, 1970), and their consequences on the shaping of cascading valorization projects. These projects are conceived here as organizational and territorial innovations. As such, these circular bioeconomy projects result from a system of heterogeneous stakeholders with situated rationality, whose confrontation of interests allows for the emergence of new governance of production at the territorial level. To account for these stakeholders, their interests, and their strategies, we focused on the case study of valorizing by-products from the pomegranate sector in southern France. We conducted semi-structured interviews with the stakeholders involved in this emerging production system. We analyzed the norms, regulations, and contracts that govern their interactions. To simulate the confrontation of represented interests, our fieldwork culminated in a participatory workshop bringing together the interviewed actors.

Our analyses reveal the dynamics at play in the formation of a new circular bioeconomy value chain, centered on the valorization of organic waste. This process involves a complex interplay between farmers, agri-food industries, energy industries, other non-food industries (cosmetics, pharmaceuticals, etc.), and institutional actors (local authorities, research institutes, etc.). The discussions that shape this emergence focus on the distribution of responsibilities, investments, and value. Each stakeholder asserts their position based on

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their resources and the asymmetry of their relationships with other system participants. The emergence of such a value chain has the potential to disrupt the existing organization of production, creating conflicts and confrontations that are resolved differently depending on the territory. For example, it could alter upstream-downstream relationships between agri-food industries and farmers by introducing new interlocutors for the latter, giving them the opportunity to escape asymmetric relationships prevalent in certain food systems.

Keywords: circular bioeconomy, territory, productive system, governance

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**Keywords:** Circular bioeconomy, territory, productive system, governance, innovation, Territorial Development