

Co-designing coupled innovations to strengthen the sustainability of territorialised agri-food systems: the case of fruit and vegetable production in Martinique

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Context and objective

The current context, marked by multiple crises (environmental, health and socio-economic), calls for a profound transition of agricultural and food systems towards more sustainable models. Transforming these systems involves complex and even wicked problems and requires overcoming the systemic barriers that characterise them (Rip and Kemp, 1998; Meynard et al., 2017). In this context, it seems appropriate to adopt territorialised approaches to support the transition, as they promote coordination between actors and embedded solutions. The literature highlights the value of designing coupled innovations, i.e. the coherent combination of different types of innovations (technical, organisational, institutional and/or social) to solve a complex problem (Leclère et al., 2025). Coupled innovations therefore, by definition, link several components of the agri-food system, often managed by different actors (Meynard et al., 2017) and at different scales. However, research on the conditions for designing and implementing these innovations remains limited, particularly in overseas territories. Yet the challenges of food sovereignty, climate vulnerability and import dependency reinforce the need for systemic and territorialised innovations in these particular territories.

This paper analyses a process of co-designing coupled innovations initiated by researchers aiming to secure local production of agroecological fruit and vegetables in Martinique. The territory faces significant structural constraints, which explain the limited nature of local supply. These constraints are due to particular agro-climatic conditions, low production volumes, the fragmentation of supply chains and limited forms of coordination between actors. They explain the persistent gap between supply and demand for local products. Furthermore, the main obstacles to securing a high-quality and sustainable local supply do not solely depend on the plot or farm level, but also on mechanisms that operate at the territorial level. This scale therefore appears relevant for designing coupled innovations (Navarrete et al., 2024).

In order to develop a shared vision of the objectives to be achieved (i.e. desirable unknown) and to explore collective solutions to overcome lock-ins, a participatory methodology has been proposed. Our methodological proposal is based on the implementation of co-design workshops to identify and formalise prototypes of coupled innovations with participants. By reflecting on these innovation combinations, the collective cognitive process initiated aims to promote mutual understanding, strengthen coordination between actors and suggest courses of action to be implemented.

Method

Following the C-K theory (*Innovative design thinking theory*, Hatchuel and Weil, 2009), a multi-stage process of eliciting ideas to respond to the identified problem (i.e. securing local supply) and mobilising knowledge was initiated. To fill the space K, a phase of sharing and discussing the main results of a socio-technical diagnosis (Casagrande et al., 2023) carried out beforehand was conducted. In this phase K, the objective is also to overcome the participants' fixation effects by bringing in new knowledge. Space C, meanwhile, is filled with the solutions proposed by the actors to respond to the initial problem and move towards the desirable unknown. Two workshops were organised, bringing together a diverse range of actors from the agri-food system, each with representation or decision-making powers.

Results

The results highlight the emergence of several prototypes of coupled innovations, combining different dimensions. On the one hand, organisational innovations aim to increase supply volumes, pool skills, or optimise access to financial aid. On the other hand, technical innovations focus on crop diversification in order to improve the management of climatic and health hazards or to enhance the value of heritage crops. These ideas combine technological innovations to design processing tools adapted to the specific characteristics of local products and help create added value. The analysis highlights that the co-design of innovations between stakeholders and researchers promotes coordination between stakeholders and the production of contextualised knowledge, enabling the emergence of systemic innovations adapted to the territory. Coupled innovations thus appear to be a promising lever for supporting the reterritorialisation and ecologising agri-food systems. This work leads us to reflect on the scaling up and the implementation of innovations. It raises questions about how the facilitation/consultation activity carried out by researchers could be taken up by other stakeholders.

Keywords

Coupled innovations, co-design, agri-food system, actors, territory

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