



FARMING SYSTEM DESIGN FOR SUSTAINABLE AGRIFOOD SYSTEMS: THEORIES AND PRACTICES

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Portraying agroecological initiatives to support transformative change

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Introduction

Transdisciplinary knowledge is increasingly recognized as crucial for driving sustainable transformation of agrifood systems. Collaborations between scientists and practitioners within societal initiatives, such as living labs, offer significant potential to accelerate a transition towards agroecology. Developing a shared understanding of the history and current state of societal initiatives reinforces the effectiveness of such science-society interactions. Within the multi-actor project Agroecology-TRANSECT (<https://www.agroecology-transect.net/>), involving eleven agroecological initiatives across Europe (hereinafter referred to as Innovation Hubs, or IHs), we developed a learning-oriented framework to achieve this goal (Cassart et al., 2025). IHs consist of networks of societal and academic actors collaborating around systemic, agroecological solutions (Table 1). Project interactions with IHs are mediated by "IH facilitators" - eight researchers, two agronomic advisors, and one organic box scheme manager.

Location	Main agroecological topic
Belgium	Tillage reduction in organic field crop systems
Bulgaria	High Nature Value farming systems
Denmark	Conservation Agriculture
French Massif Central	Dairy farming in the Massif Central
Guadeloupe	Small-scale tropical mixed farming systems
Hungary	Cover crop management in vineyards and orchards
The Netherlands	Strip-cropping
Romania	Market identity for Bio+ and agroecological products
Slovenia	Organic box scheme
Spain	Regional agroecological food systems
Switzerland	Grasslands management




Table 1: Location and main agroecological topic of the 11 IHs.

Methods

The framework comprises an analysis of four pillars: (a) Context, (b) Actors, (c) Barriers/Levers and (d) Relation to agroecological principles, defined through a combination of quantitative and qualitative characterization and assessment approaches. The process of applying the framework involves multiple interactions among participants, i.e. regular online or in-person interactions with IH facilitators, in-depth interviews with key stakeholders from the initiative,

and reflexive feedback on the results. Context is described through six dimensions. Key actors within the network and key barriers and levers to IH agroecological transition were identified, applying network metrics as part of cognitive mapping and social network analysis. The relative importance of agroecological principles (HLPE, 2019) was investigated based on implemented practices and facilitators' perception (Dumont et al., 2025). Finally, a cross-case analysis is underway (Cassart et al., in preparation), drawing on methods like Multiple Correspondence Analysis and narrative comparison to derive generalizable insights across the IHs.

Results

The framework has been actively applied within the project, benefiting from its overarching learning-oriented approach, building on co-innovation (Rossing et al., 2021). Through its four pillars, the heuristic framework facilitates a shared understanding among project participants on each IH's history and current state, highlighting potential avenues for joint action. While the context analysis outlines the setting of each IH within the broader food system, the actor network analysis, the identification of barriers and levers to agroecological transition, and the characterization of their relation to the 13 agroecology principles provide actionable knowledge.

Furthermore, the transversal analysis (in progress) highlights key trends across our diverse agroecological initiatives. For instance, farmers and researchers appear central in most networks, with researchers playing a significant role when they originate the initiative (e.g. through scientific programs). In such cases, they act as network builders and knowledge facilitators through participatory research. These research-led initiatives typically address more the agroecology principles related to the agroecosystem level. In contrast, initiatives emphasizing food system-level principles often have central actors like NGOs, local activists, or distributors working alongside farmers, rather than being researcher-driven. This diversity in actor dynamics and the principles they mobilize illustrates the adaptive nature of agroecology, which accommodates different balances depending on local needs, priorities, and socio-economic contexts (Dumont et al., 2025). In addition, recurring barriers hindering transition and levers facilitating it were found across the IHs, spanning themes like policy, economy, knowledge or social organization. Common barriers include inconsistency of EU and national regulations regarding agroecology or limited farmer profitability. The analysis of the levers (e.g. improved consumer relationships, rising market demand for agroecological products or collective marketing strategies) implemented by the IHs to tackle those common barriers is insightful.

Discussion and Perspectives

Leveraging more comprehensive methods for characterization and assessment, we present a learning-oriented framework to develop a shared portrait of an agroecological initiative. Striking a balance between comprehensiveness and promptness while upholding scientific rigor, the four pillars have proved to form a coherent and replicable framework, enabling to pinpoint scientifically robust, locally relevant opportunities to guide transformative efforts. For instance, the Danish IH recognized Conservation Agriculture as a niche in the regime and identified missing actor connections. The Belgian IH appreciated the analysis of barriers and levers, noting its alignment with their current technical focus. The French IH valued the national positioning through the context analysis and saw opportunities to enhance connections with economic actors, while recognizing the strong role of researchers within their IH. Such reframing of how we see the world has been denoted as social learning, considered essential for transformative change (Rossing et al., 2021). Moreover, the shared understanding fostered through the portraits nurtures trust and social capital, crucial elements for effective science-society interactions (Douthwaite & Hoffecker, 2017). Finally, our framework supports cross-case learning and advances knowledge on agroecological transitions across Europe.

References

Cassart, P., A. Frei, H. Hauggaard-Nielsen, H. Kruse Rasmussen, A. Swartebroekx, E. Froidmont, D. Stilmant, and W. A. H. Rossing. (2025). A heuristic framework to portray agroecological transition initiatives in reflexive arrangements, illustrated with a conservation agriculture network in Denmark. *Ecology and Society* 30(2):10.

Douthwaite, B., & Hoffecker, E. (2017). Towards a complexity-aware theory of change for participatory research programs working within agricultural innovation systems. *Agricultural Systems*, 155, 88--102.

Dumont, B., Barlagne, C., Cassart, P., Duval, J. E., Fanchone, A., Gourdine, J.-L., Huguenin-Elie, O., Kazakova, Y., Klötzli, J., Lüscher, A., Oteros-Rozas, E., Pomies, D., Rivera Ferre, M. G., Rossing, W. A. H., Stefanova, V., Swartebroekx, A., & Zagaria, C. (2025). Principles, barriers and enablers to agroecological animal production systems: A qualitative approach based on five case studies. *Animal*, 19, 101367.

High Level Panel of Expert. (2019). HLPE Report 2019 Agroecological and other innovative approaches, FAO Rome, 163 pp.

Rossing, W. A. H., Albicette, M. M., Aguerre, V., Leoni, C., Ruggia, A., & Dogliotti, S. (2021). Crafting actionable knowledge on ecological intensification: Lessons from co-innovation approaches in Uruguay and Europe. *Agricultural Systems*, 190, 103103.



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