FARMING SYSTEM DESIGN FOR SUSTAINABLE AGRIFOOD SYSTEMS: THEORIES AND PRACTICES

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How can transdisciplinary projects contribute to agroecological transformation?

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Introduction

With a basis in integrating scientific knowledge with experiential, local, traditional (etc.) knowledges, agroecology aligns with recent efforts to address sustainability challenges and stimulate transformative change in transdisciplinary research projects, and a general trend of multi-actor approaches that connect science with practice (Cronin et al., 2022).

Yet many questions remain as ideas and ambitions are translated into practice (Fernández González et al., 2021). A knowledge gap remains in terms *process* how to effectively design, manage, and monitor projects to support transformative change pathways; and *outcomes*: how 'actionable knowledge' outputs can be evaluated in terms of their various contributions to transformative change (Rossing et al., 2021). Critical explorations of these knowledge gaps are highly relevant (Fernández González et al., 2021; Turnhout et al., 2020).

As agroecology has entered institutional spaces it has become a 'territory in dispute', marked by tensions between conformity and transformation (Giraldo and Rosset, 2018). Transformation envisions fundamentally alternative agri-food systems, while conformity makes (relatively minor) tweaks to existing productivist systems (Walthall et al., 2024). Integration of critical social science (Sayer, 2009) can assist project participants and designers in orienting towards transformative visions and activities by enabling deeper structural analysis of constraints which keep agri-food systems locked-in to unsustainable trajectories (Ceddia et al., 2024). This integration of critical social science builds upon recent calls for 'co-innovation' as an approach to reflexive, complexity-aware project governance (Leclère et al., 2024; Rossing et al., 2021), which can in turn be used to support impact through learning-oriented monitoring and evaluation.

Our paper features a case study of the authors' ongoing collaboration in the Horizon Europe project Agroecology-TRANSECT (AE-T), which aims to generate (1) actionable knowledge with 11 territorially-rooted agroecological initiatives (called 'innovation hubs', IHs); and (2) to contribute to transformative change. Building on efforts of previous projects (Leclére et al., 2024; Rossing et al., 2021), AE-T has embedded a co-innovation approach into the project governance. Our paper examines the extent to which the aspirations o this approach are realized, while seeking to understand and explain the factors that enable/constrain AE-T in achieving its mission-oriented goals. In doing so, we contribute to middle-range theory on the 'how' of doing transdisciplinary projects for transformative change.

Methods

Our evaluation draws on realist evaluation to 'test' project's theory of change, which project participants have articulated and refined as part of the co-innovation approach. Here we have

structured the evaluation by developing two 'hypotheses' that summarizes components of the project's theory of change:

1. Co-innovation processes generate trust and social learning which support generation of actionable knowledge.
2. Actionable knowledge and social learning in a transdisciplinary project can generate contributions to the unfolding of agroecological transformation.

These hypotheses are 'tested' against the qualitative empirical data gathered in the first two years of the AE-T project (i.e. semi-structured interviews with project participants and participant observation at a series of project meetings), using retroductive analysis. In order to assess the second hypothesis, we have relied on frameworks developed in literature on transformative agroecology (see Figure 1; Anderson et al., 2021; Walthall et al., 2024).

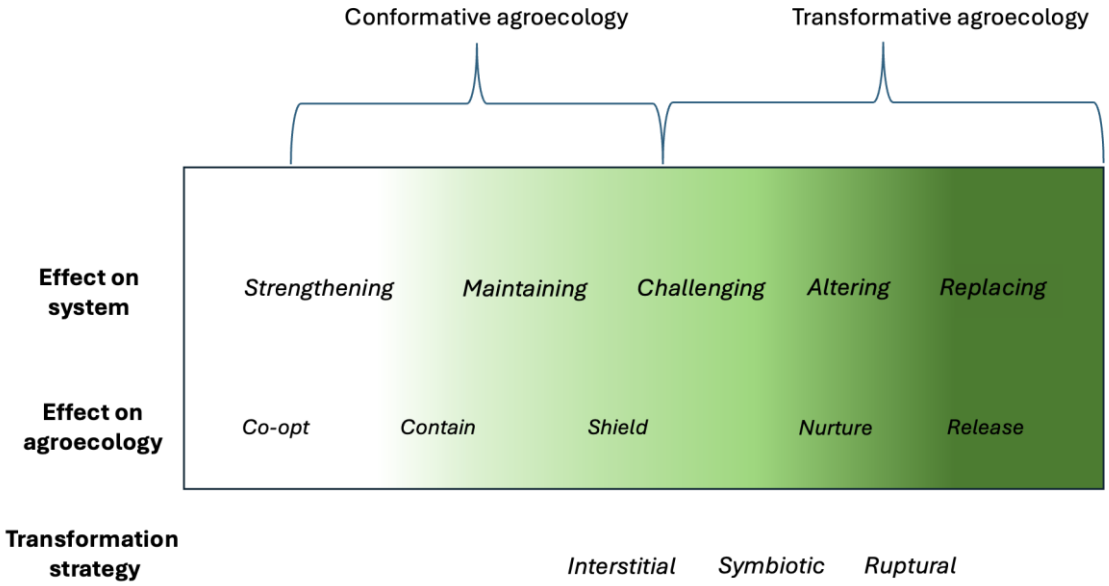

Figure 1. Own formulation for conceptualizing the different effects of interventions on existing systems and on agroecology, building on, i.a., Anderson et al. (2021).

Results (highlights)

Hypothesis 1:

- Trust and social learning have been generated, mostly among WPs and IH facilitators who are directly connected through project activities. But difficult to 'scale' beyond this 'core group'.
- Access to resources and time from the project, have been key mechanisms for successful IH outcomes.
- Concerns about project work remaining at academic level, despite intentions to do otherwise.

Hypothesis 2:

- Reports of transformative learning amongst project 'core group'; questions remain about how to measure/report/scale these outcomes.

- Several 'successful outcomes' (self-defined by IH missions) could be considered in line with "co-opting" agroecology (Anderson et al., 2021, Whitehall et al., 2024); highlighting tensions between open-endedness and determinism (Lamine et al., 2021)
- Lack of involvement of social movements and more radical niche initiatives in initial project design limits transformative potential of project interventions

Discussion and perspectives

While challenges are ongoing, the co-innovation approach has been key for addressing and adapting during the project. Deeper integration of critical social theory into initial project design and framing, and learning-oriented monitoring can enable project participants to more reflexively orient their planning and activities, which helps empower them to avoid traps of 'conforming' despite transformative intentions.

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