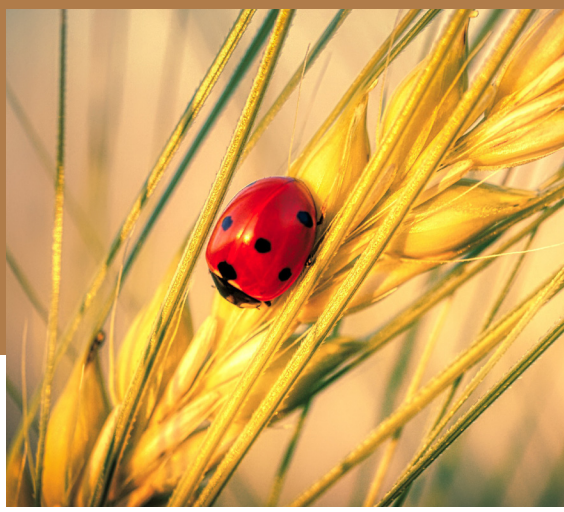
agroecology transect

Producing actionable knowledge for transformative change:

impacts, potentials, and challenges in transdisciplinary research



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Summary and key message

As a central part of its research and innovation strategy for sustainability, the EU funds projects that bring together the knowledge of scientists, farmers, and other actors to find solutions for societal challenges. These so-called 'transdisciplinary' projects aim to produce knowledge that is both scientific and *actionable*, i.e. context-specific and useful for actors pursuing the transition of agri-food systems toward sustainability.

In reality, transdisciplinary projects often struggle to achieve the aspiration of creating deep, lasting change through knowledge production, partly because they are forced to work within systems that make sustainability transformations unfeasible for individuals and small groups. **Achieving sustainability requires a more enabling policy environment**: actors need to be better supported by systemic changes that are informed by and evolving along with their context-specific needs and realities.

Agroecology-TRANSECT (AE-TR) is a project that works to produce actionable knowledge for agroecological transformation. Here we provide insights for future Research and Innovation funding, and design and management of projects, based on inputs from 11 "Innovation Hubs" (IHs) in Europe: each of these is a network of farmers, researchers and other actors engaged in transitions to agroecology. The work with IHs has demonstrated various ways in which actionable knowledge production can contribute to transformative change in transdisciplinary projects. But we also saw how (perceived) **systemic constraints and lock-ins can prevent actors from creating the deep transformations that are needed to address societal challenges**. These require policy action.

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What is Agroecology? What key challenges does it address?

Agri-food systems are a primary driver of global environmental change, pushing planetary boundaries in climate, biodiversity, and freshwater use beyond their safe limits. International expert bodies such as IPBES and IPCC have identified agri-food systems as needing urgent transformation. Agroecology – defined as the application of ecological and social principles to the design and management of agri-food systems – is one approach funded by the EU to foster such transitions. As a paradigm shift in food systems that aims to leverage social and ecological diversity, agroecology addresses a number of EU policy objectives, including reversing **biodiversity loss**, **mitigating and adapting to climate change**, and **fostering socio-economic resilience**.

Approach

The AE-TR project aimed to produce actionable knowledge using a learning-oriented approach, by helping project participants reflect on their actions and adapt in the face of inherent unpredictability and complexity (Rossing et al., 2021). Project researchers facilitated yearly cycles of action and reflection for IHs (Figure 1). These involved frequent interactions through 'learning histories', check-in calls, and bi-annual in person meetings to promote knowledge exchange and trust building (co-innovation workshops and annual meetings). These interactions built up to a new yearly action plan for IHs.

Drawing on observations from the learning cycle and interviews with IHs, AE-TR project researchers sought to understand how EU-funded projects could be better designed and managed toward achieving their goals. To this end, we first asked how actionable knowledge is produced; and then evaluated how and to what extent this resulted in contributions to agroecological transformation. Our results have implications for the design, funding and evaluation of future research and innovation projects – but it also has policy implications.

Figure 1 – **Map of 11 Innovation Hubs (IHs) involved in Agroecology-TRANSECT (AE-TR)**

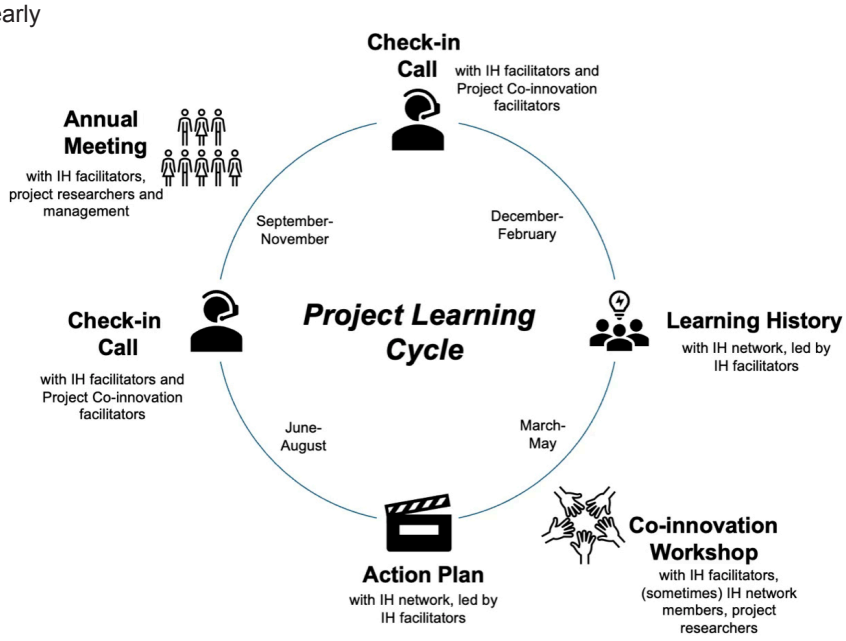

Figure 2 – **Action and reflection learning cycle in AE-TR**

Main results

- **Reflection activities created space for learning and strategic adjustments**
- **Provision of knowledge, resources and legitimacy enhanced capacities for some IHs to make changes in networks and institutions**
- **Systemic barriers limited the extent of transformative action**

Cognitive shifts lay the groundwork for transformative change

Learning cycles in AE-TR provided actors with a space to step out of their busy routines and reflect on their actions and goals within IHs. This space, along with knowledge exchange in the project, led to shifts in thinking and understanding. For example, many participants reported that they developed a deeper and more systemic understanding of sustainability problems and solutions. Others became more conscious of the roles they play in changing agri-food systems and the interface between science, society and policy. These changes helped prepare the terrain for greater responsiveness to emerging transformative opportunities. In some cases, these new understandings sparked new action plans and strategies. This strategic reflection and experimentation enhanced potential for actors to influence their environment more effectively.

Potentials and limitations of transformative action

The AE-TR project also led to direct impact on actions. The resources (funding, time, knowledge) provided by the project enabled some IHs to devote more time to expanding their networks and influencing their institutional context. IH Netherlands used resources from the project to devote more attention to policy work, and successfully lobbied to get the agroecological practice of ‘strip cropping’ covered by the Netherlands CAP eco-scheme. Other IHs were able to devote more time and energy to similar policy efforts. Several IHs reported that being recognized as a member of a European project already enhanced their capacities, and perceived legitimacy, to influence their contexts.

While our experiences demonstrate the potentials of transdisciplinary projects in driving change, the degree of transformative impact remained limited for two main reasons. First, the demands of research funding and a hyper-competitive academic environment create a trade-off between deep engagement with societal actors and the need to produce rapid, quantifiable research outputs. These challenges constrained researchers ability to fully realize potentials for actionable knowledge production with IHs. Second, the lack of coherent agricultural and food policy frameworks limited the extent to which farmers were willing and able to implement agroecological practices. Given the urgent need for systemic transformation in the face of climate change and biodiversity loss – as emphasized by international expert bodies like the IPCC (2022) and IPBES (2019) – the integration of isolated improvements that are viable for the majority of farmers to integrate under current political and economic conditions are insufficient. There is, thus, an urgent need to develop agricultural and food policy frameworks that support farmers in transition and ensure agroecological practices are economically viable.

Specifically, we learned from several IH networks that although the farmers they work with are often open to becoming more sustainable, they do not feel supported in doing so by policy or society at large. Change requires risks, especially during initial stages, while financial losses and risks are not feasible for farmers operating on tight margins. For instance, IHs report that many farmers are waiting for legislation to make agroecological changes as they want to avoid first mover disadvantage. Although they may be willing to make long-term investments under the right circumstances, many farmers reportedly perceive mixed political messaging that paints an uncertain picture of the future. Thus, **existing political and market frameworks were seen as the most significant bottlenecks for agroecological transition.**

Conclusion

Transdisciplinary research holds significant potential to generate actionable knowledge for transformative change in agri-food systems, as demonstrated by our experiences from 11 Innovation Hubs in the AE-TR project. However, our results underscore that to achieve sustainable and resilient food systems, Europe needs more enabling institutional conditions that empower researchers and societal actors to convert their knowledge into action. This requires a more comprehensive agri-food policy that aligns support mechanisms (e.g. direct payments, market and financial instruments) with agroecological transitions across administrative levels. R&I can play a key role in this.

Policy recommendations

Better funding of transdisciplinary research

- Provide longer-term funding, and enable flexibility and emergent changes in plans to accommodate slow(er) societal processes, more adaptability and to reap the rewards of transdisciplinary research
- Better enable actors engaged in transformative change processes, particularly civil society and community initiatives with less administrative capacity, to access funding and participate as project partners.

Providing frameworks for inclusive and transformative research

- Create opportunities for reciprocity and renumeration of societal actors, especially farmers and civil society groups, for their participation in projects
- Enable participation of civil society actors and community groups who explicitly work on transformative sustainability in research.
- Prioritize focus on political, institutional and governance innovation and experiments in addition to technological innovations
- Include 'transformative potential' of research and project partners as a funding evaluation criterion, drawing on IPBES' (2024) transformative change assessment framework.

Linking research with policy

- Link research results more directly with broader policy agendas (agriculture, trade, industrial, energy, etc.) and use project results to substantiate difficult decisions
- Support researchers, especially early-stage researchers, to go beyond a narrow focus on publication metrics and find creative ways to bridge science-policy-society divides
- Establish mechanisms that enable scientists and research institutions to participate in decision-making, integrating them into governance processes.
- Offer a more transparent place to demonstrate how science and R&I project results are considered or included in policy proposals, e.g. as references in policy texts.

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