

SCALING NATURE-BASED SOLUTIONS THROUGH STRONG NETWORKS



Summary

Successful nature-based solutions (NBS) depend not only on the technologies being developed, but also on the people and organisations that support them. The trans4num project found that innovations are more likely to move beyond pilot projects when farmers, advisors, researchers, businesses, and policymakers work together over time. Strong Agricultural Knowledge and Innovation Systems (AKIS), stable funding, and continuous knowledge exchange help adapt innovations to local conditions and increase their long-term uptake. In contrast, fragmented networks, missing actors, and short-term support can limit the wider adoption of promising solutions.

The need

Promising innovations on nature-based solutions (NBS) remain in early innovation phases because they are not well supported by strong networks of farmers, advisors, businesses, and policymakers. Across countries, weak coordination, missing actors, and fragmented funding challenge innovations stability and development for turning them into everyday farming practices.



The benefits

Well-functioning AKIS enables innovation reflection through different actors with diverse views which supports farmers access to practical knowledge, risk reduction, and adoption of new practices. Strong cooperation between actors improves the chances that innovations can be applied to local conditions, economically viable, and supported by policy and markets.



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trans4num findings

trans4num shows that successful solutions depend on how well actors work together over time, not just on the technology itself. Different country examples highlight this:

- Denmark: Strong cooperation over decades between farmers, advisors, researchers, and industry supports innovation (e.g. biorefineries), backed by stable funding and clear roles
- Netherlands: Farmer-led networks in cooperation with research drive innovation, but lack of formal support and funding challenged development stability
- Hungary: Advisory systems are more top-down, with limited farmer involvement and uneven access to knowledge
- United Kingdom: Product innovations driven by companies and researchers struggled to be applied outside trial sites.

This shows that balanced partnerships and good coordination are essential for success. Moreover, trans4num research shows that:

- High interest by farmers when involved early - Innovations on Nature-based solutions (NBS) were likely to be tested when farmers participated from the start (co-design, testing, feedback) and shared the innovation in their networks.
- Advisors as intermediaries - Trusted advisors help integrating research into practice, as farm-ready actions, and private sector advisors feed back new innovations to their company.
- Strong networks over time enable moving beyond pilot sites - When an innovation was well supported by the AKIS (e.g. Denmark), innovations moved from trials to wider adoption through coordinated farmer–advisor–industry collaboration.
- Network diversity alone is not enough - Diverse networks can have weaknesses when actor number and linkages are sparse (e.g. Hungary) or when informal networks (e.g. Netherlands) dependent on a few motivated actors.
- Missing broader actors involvement - Lack of involvement of additional actors (e.g. actors apart from core innovation group and research in UK, or private sector in NL) led to gaps between innovation and real-world application.
- Stable funding and coordination are essential - Long-term success depended on consistent funding, advisory support, and broadening the innovation in various actor groups.

What were the challenges / limitations in the implementation process?



- Innovations potentially remain (longer) in a trial phase if key actors (e.g. farmers or advisors) are missing
- Weak coordination between policy, research, and practice slows innovation stabilisation
- Short-term or fragmented funding challenges long-term impact
- Limited communication between stakeholders reduces trust and uptake

What kind of resources do you need to implement the proposed solution?



- Strong advisory systems: trusted advisors linking research farmers and businesses
- Inclusive networks: a diversity of actors that are densely linked
- Stable funding: long-term financial and infrastructural (e.g. trial sites) support
- Knowledge exchange: regular interaction within and across actor groups, demonstration farms, and peer learning

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AKIS is a concept rather than a formal structure, so it is not the AKIS itself that is convened, coordinated, or directed. Rather, responsibility lies with the actors and intermediary arrangements that connect the relevant stakeholders and support innovation processes. These intermediaries do not necessarily need to be highly institutionalised. The Danish case shows the value of a relatively stable and trusted regional innovation intermediary with a broad mandate across sectors, but the Dutch case demonstrates that less formalised, network-based forms of coordination can also play an important role. In both cases, what matters is the ability to bring together farmers, advisors, researchers, value-chain actors, public authorities, and civil society, and to facilitate knowledge exchange and innovation development in context-specific ways.

For the Danish case in particular, the recommendation would be that innovation should be supported by a trusted regional innovation intermediary or multi-actor platform that can engage actors beyond agriculture, including processing industries, energy companies, municipalities, and relevant ministries. However, this should not be understood as a one-size-fits-all model: the appropriate form of coordination depends on the stage of the innovation process, the type of innovation, and the (institutional) context.

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