Sustainable agri-food systems and ecosystem management

RURACTIVE

RURACTIVE Forum Background document

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This document highlights key challenges and opportunities in rural agrifood systems and ecosystem management, based on RURACTIVE project activities and insights from rural innovation hubs (Dynamos). It presents the project approach to this Rural Development Driver (RDD) and shows how local farming, land stewardship, and food networks inform policy discussions.

The RURACTIVE Forum – Third meeting explores early directions for rural agri-food and ecosystem policy. Findings will shape policy recommendations, to be validated at the Fourth meeting on 30 June 2026.

1. Introduction

Sustainable agri-food systems and ecosystem management have emerged as central levers for climate adaptation, biodiversity protection, food security, and rural economic resilience across the European Union. **Agriculture, land stewardship and ecosystem services are deeply interconnected**, influencing soil and water health, carbon storage, landscape management, and the viability of local livelihoods. Rural areas are uniquely positioned to contribute to climate mitigation and nature-based solutions, while also facing structural pressures such as depopulation, aging farming populations, market fragmentation, and resource constraints.

Within the RURACTIVE framework, sustainable agri-food systems are treated as a Rural Development Driver (RDD) with systemic impacts across climate resilience, biodiversity, social inclusion, and territorial cohesion. Evidence from the project deliverables, complemented by project inception reports, policy briefs, and other relevant documents, highlights both the **potential of agroecological practices, diversified food systems and ecosystem restoration to drive sustainable development** and the complex barriers that need to be addressed to enable policy-aligned transformation.

2. Strategic EU policy context

Sustainable agri-food systems are embedded in multiple EU policy frameworks:

- **Common Agricultural Policy (CAP)** – Article 39 TFEU outlines objectives for increasing productivity, ensuring farmers' incomes, stabilising markets, and securing supplies, providing the principal funding and regulatory framework for rural agri-food development. CAP Strategic Plans guide Member States in aligning local interventions with these objectives.
- **European Green Deal and Farm to Fork Strategy** – ehese frameworks emphasise climate neutrality, sustainable production, circular economy approaches, and resilience of food systems. Key targets include reducing greenhouse gas emissions from agriculture, promoting organic and regenerative practices, and strengthening short food chains.
- **Biodiversity and ecosystem policies** – ehe EU Biodiversity Strategy, Birds and Habitats Directives, the 2023 EU Nature Restoration Law, and the Water and Marine Strategy Framework Directives collectively set binding targets for ecosystem protection, restoration, and sustainable management of land and water resources, with implications for agri-food land use, forest and peatland management, and watershed stewardship.

2.1 Evolving EU policy instruments and opportunities

Recent and upcoming EU initiatives shape the agrifood and ecosystem landscape:

- **EU Nature Restoration Law** – Targets restoration of 20% of EU land and sea by 2030, all degraded ecosystems by 2050. This law directly affects agroecosystem and land-use practices, particularly restoration of peatlands, riparian systems and agricultural landscapes.

- **New Vision for EU Agriculture and Food** – Focuses on fair farmer income, generational renewal, food sovereignty, decarbonisation, and digital/biotech adoption.
- **European Biotech Act** – Supports sustainable productivity and efficiency through technology integration.

3. RURACTIVE integrated approach to agrifood and ecosystem management

In RURACTIVE, agrifood and ecosystem management are approached through a **collaborative and place-based process** involving local communities, farmers, land managers and organisations working across food production and environmental stewardship. Across Dynamos, work begins **with identifying locally specific challenges** (ranging from climate-related pressures on land and water, to gaps in knowledge, market fragmentation or declining ecological conditions) based on local discussions and community insights.

Building on these shared understandings, **groups then explore and co-develop practical, context-appropriate ideas for solutions**. These often relate to regenerative and climate-smart farming practices, actions to strengthen local food networks, the revitalisation of ecosystem functions, or initiatives that help transfer knowledge between generations and professional groups.

Throughout this process, **RURACTIVE emphasises broad participation, inclusive engagement and evidence grounded in local realities**. This ensures that emerging solutions are realistic for rural territories, support both environmental and economic sustainability, and contribute to healthier agroecosystems and more resilient rural communities.

3.1 Cross-cutting priority considerations

Three cross-cutting priorities are considered through the whole process from challenge identification to implementation of solutions:

- **Climate change mitigation and adaptation**: sustainable farming practices, water-efficient and careful soil practices, and nature-positive land use to help reduce emissions and increase resilience.
- **Biodiversity**: agroecological approaches, maintenance of species-rich habitats, and pollinator-friendly practices.
- **Social justice and inclusion**: fairer access to markets, diversification of rural livelihoods and the involvement of younger and under-represented groups strengthen equity within agrifood systems.

4. Structural agrifood and ecosystemic challenges in rural territories

Evidence from RURACTIVE project activities highlights persistent structural barriers affecting agrifood systems and ecosystem management across diverse rural contexts:

4.1 Climate and environmental stressors

Rural areas face rising climate pressures that threaten agricultural productivity and ecosystem health:

- Heat stress, drought, flooding, and soil degradation reduce crop yields and farm resilience.

- Peatland degradation, water scarcity, and fragile island or mountainous ecosystems further limit sustainable land use.

4.2 Demographic and knowledge constraints

Rural regions struggle with ageing farming populations and erosion of traditional ecological knowledge:

- Limited generational renewal reduces adoption of innovative and sustainable practices.
- Knowledge gaps hinder the effective implementation of climate-smart and biodiversity-friendly agriculture.

4.3 Market and value chain fragmentation

Small-scale producers and rural food networks experience structural economic constraints:

- Limited access to markets and low-value supply chains reduce income potential.
- Weak integration with regional, national, and international networks restricts competitiveness and resilience.

4.4 Governance and administrative gaps

Complex governance frameworks and coordination challenges impede effective policy implementation:

- Competing land uses across agriculture, tourism, and conservation generate conflicts.
- Bureaucratic complexity in CAP and local development programs creates barriers, especially for low-capacity municipalities.

4.5 Resource and infrastructure limitations

Rural agrifood systems face constraints in physical and technical infrastructure:

- Limited water management, nutrient, and pest control systems restrict production efficiency.
- Insufficient ecological restoration capacity and rising energy/input costs challenge farm sustainability, particularly for smallholders.

The examples presented in Table 1 illustrate some of the challenges collaboratively diagnosed in two different rural innovation hubs (Dynamos) as well as various proposed solutions to address them.

Table 1 Agrifood and ecosystem management examples from RURACTIVE Dynamos

Dynamo 3 **Zamora, Spain**		***Dynamo 1*** **Northern Ostrobothnia, Finland**	
Identified challenges	**Solutions developed**	**Identified challenges**	**Solutions developed**
Climate impacts reducing agricultural productivity: heat stress, soil degradation, and ageing farmer	**Smart Crop (precision agriculture)**: use of drones, sensors, satellite data and AI to	**Transition to carbon-sequestering farming on drained peatlands**: farmers face pressure to shift land use practices under	**Climate-Smart-Agriculture Workshops**: field trips + workshops supporting regenerative, biodiversi

population weaken resilience. **Fragmented local food networks and weak market access:** small producers face low visibility, limited logistics, and loss of cultural food knowledge.	support climate-adaptive farming. **Food heritage and Intergene rational Knowledge Actions**: youth–elder programmes, storytelling, and cultural food preservation initiatives.	Finland's national climate and restoration programmes. **Ecosystem restoration obligations affecting farmland**: HELMI[1] biodiversity requirements and land use regulations create tensions between farming and restoration. **Digital divide limiting adoption of Climate-Smart-Agricultural tools**: older farmers and remote households struggle with digital services required for climate-aligned farming.	ty-friendly and carbon-sequestering practices. **DigiGuide for Agricultural Digital Literacy**: supports access to digital farming tools, subsidy applications, and climate reporting.

5. Emerging innovation pathways and local responses

Within RURACTIVE project activities, participating rural regions are piloting a range of locally adapted solutions addressing agrifood sustainability and ecosystem management challenges.

Nature-based climate mitigation	Digital and technological innovation
Territories prioritise ecosystem restoration and climate-smart land management: • peatland restoration and carbon-sequestering farming practices • biodiversity-positive land stewardship and habitat regeneration	Regions experiment with digital tools to improve farm productivity and sustainability: • precision farming technologies and sensor-based monitoring • digital food mapping and e-commerce platforms for local producers
Community-based resource systems	**Participatory governance and social innovation**
Local initiatives focus on integrated resource use and circular approaches: • agroecological networks and local biogas installations • water-efficient irrigation and resource recycling systems	Regions promote collaborative and community-led approaches to rural development: • cooperative networks for local marketing and value chains • integration of agri-tourism and regenerative land stewardship

[1] A national biodiversity conservation initiative in Finland running 2021–2030, led by the Ministry of the Environment and the Ministry of Agriculture and Forestry, more info: *https://mmm.fi/en/helmi-programme*

6. Persistent gaps in EU funding and Performance Framework

Despite growing policy attention, stakeholder feedback highlights structural weaknesses in EU funding and monitoring systems affecting rural agrifood and ecosystem initiatives. **Current frameworks remain largely output-oriented, focusing primarily on measurable deliverables** such as hectares restored or capacity installed rather than long-term environmental and socio-economic outcomes. Shortcomings in current EU monitoring and funding frameworks:

- **overemphasis on output indicators** (e.g., hectares restored, capacity installed) rather than outcomes such as soil health, biodiversity recovery, or ecosystem resilience;
- limited support for small-scale, community-led initiatives, which often struggle to access large funding instruments;
- high administrative burdens for municipalities, farmers, and rural actors with limited technical capacity;
- fragmentation across funding instruments, including agricultural, environmental, and competitiveness programmes;
- insufficient indicators capturing resource efficiency, biodiversity outcomes, and food system resilience.

7. Implications for proto-policy development

Evidence from RURACTIVE suggests that **advancing sustainable agrifood systems and ecosystem stewardship requires a shift from sectoral interventions toward integrated territorial approaches**. Rural areas play a critical role in delivering climate mitigation, biodiversity protection, and resilient food systems, raising several strategic considerations for policymaking:

- How can EU policies **better connect agricultural, biodiversity and climate goals within place-based rural strategies**, reflecting tensions communities experience around land use and restoration obligations?
- What **incentives or advisory systems could support the uptake of regenerative and agroecological** practices, especially where climate pressures and ageing farming populations limit capacity?
- How can EU initiatives **strengthen short food chains and local value-added networks**, improving market access for small producers in fragmented regions?
- What mechanisms could improve **digital inclusion in agriculture**, ensuring farmers can access climate-smart tools, applications and reporting systems?
- How can **funding and monitoring frameworks shift toward outcomes such as soil health, biodiversity recovery and ecosystem resilience**, which communities consider essential but find hard to demonstrate?

8. ADDITIONAL READING

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