



ALL-Ready – The European Agroecology
Living Lab and Research Infrastructure Network: preparation phase

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Report on the added value of the European Network

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List of abbreviations

AAFC	Agriculture and Agri-Food Canada
BÖL	Bundesprogramm Ökologischer Landbau
CSA	Coordination and Support Action
EC	European Commission
EIP Agri	European Innovation Partnership for Agricultural Productivity and Sustainability
ENRD	European Network for Rural Development
LAG	Local Action Group
LL	Living Lab
NCP	National Contact Point
NRN	National Rural Networks
OIA	Open innovation arrangement
ÖMKI	Research Institute of Organic Agriculture
RI	Research Infrastructure
WP	Work package

Executive summary

This document is Deliverable D4.1 in the Work package (WP) 4 “Implementation and Sustainability of the Network”. WP 4 aims to provide an implementation plan that ensures the added value and sustainability of the European Network of LLs and RIs capturing and promoting long-term processes of transitions to agroecology. In particular, this report includes the results of Task 4.1 “Identification of the added value of the European Network”.

The overall objective of this Deliverable (D4.1) is to improve the understanding of the potential added value of a European Network of Living Labs and Research Infrastructures in addressing key challenges of the community of agroecology LLs and RIs and promoting transitions towards agroecology. The report analyses and synthesises key challenges and needs in the community of agroecology LLs and RIs and the potential benefits they expect from a European Network based on the mapping activities in WP2, pilot network workshops in WP3 and additional empirical data collection done through interviews with a selection of LLs, RIs, other open innovation arrangements (OIA) and funding organisations. It explored the added value of the European Network of LLs and RIs in contributing to addressing those challenges and its contributions to key activities and values of transitions to agroecology.

In summary, the participating agroecology LLs and RIs have expressed a variety of key challenges and needs related to the operationalisation and the management of their research and innovation activities. These relate to maintaining innovations and overcoming barriers of adoption, economic (long-term) sustainability, stakeholder engagement (with the need for communication and social skills and positive and constructive mindsets highlighted) and the understanding and application of the living lab methodology, and data management and ownership. Data related issues include lack of data sharing and the need for suitable common data platforms and conflicts regarding data ownership and property rights. Particular challenges highlighted for research infrastructures relate to the interdisciplinary and long-term nature of experiments as well as to transboundary data management across research infrastructures in different countries.

Access to funding is a common challenge for most living labs and research infrastructures. Important funding gaps exist for training and demonstration and maintaining infrastructures and networks. In parallel to project-related funding for carrying out specific research and innovation actions, funds are needed for financing permanent staff members to manage and maintain research infrastructures and networks.

The need for a stronger consideration of funding the long-term management of living labs and research infrastructures is mirrored in the responses of the funding organisations. This could be potentially addressed by utilising synergies in combining public and private funding and improved coherence between different funds. However, funding organisations indicated cases of reduced willingness of private funders to invest in agroecology transitions in post-pandemic times. Further key challenges reported by funding organisations relate to the relevance of funded research for end-users, e.g. farmers and citizens, and the need for improved integration of applied and academic research.

Interviewed initiatives of living labs and research infrastructures and funding organisations shared common views on key benefits they expect from participating and funding a European Network of Agroecology Living Labs and Research Infrastructures. For example, these include strengthened networking and collaboration (including regional networking modules or clusters), supporting long-term funding strategies, enhanced portfolios of research and innovation activities promoting synergies between different ecosystem functions, and strengthened knowledge creation, exchange and diffusion resulting in further improvements in organisational aspects of the living labs and research infrastructures, and thus more effective governance.

A main role of such a European Network was also seen in raising awareness of topics and impacts of transitions to sustainable farming and food systems for wider society (e.g. social aspects of access to healthy food), which has the potential to increase motivation of wider food systems actors to engage in LLs. An important added value of a European Network would be to reach the entire value chain, from seed producers to consumers, promoting value chain solutions (e.g. improving quality standards and improving access to markets.) and supporting the creation of circular and solidarity economies.

There is the expectation for the Network to support participating LLs and RIs in reaching out and collaborating with schools and educational organisations, and to work in close collaboration with EIP Agri and its operational groups. This is to utilise synergies and complementarities (with EIP Agri) and to increase knowledge about results and solutions developed on farms and business incubators. Close collaboration with other networks in the European agricultural and rural development arena (e.g. the European Network for Rural Development) and with other Horizon Europe Partnerships and Missions will further enhance synergies, e.g. fostering knowledge transfer with the LLs and lighthouses of the Soil Mission Europe.

The complexity of the challenges to be addressed in transitions of farming and food systems to agroecology, requires concerted and integrated efforts of science, practice and society, and policy at European scale, which cannot be achieved only with relatively short-term research projects, or by a single country on its own. The European Network for Agroecology LLs and RIs can provide a coordinated, large-scale initiative that promotes knowledge transfer and capacity building on the development, uptake and upscaling of agroecology at different levels, paying attention to complementary experiences, insights and contexts at local level. A main challenge to be addressed is the development and implementation of a sustainable long-term strategy and implementation plan for the governance, funding and activities of the European Network to contribute to effectively filling remaining knowledge gaps, while at the same time boosting real-life and place-based approaches. The European Network can capitalise on the advances of past and ongoing research and utilise the potential of agroecology and of local innovation to accelerate the transition towards sustainable, climate- and ecosystem-friendly farming systems in Europe.

The improved understanding of the potential added value of the European Network in addressing key challenges of the community of agroecology LLs and RIs and promoting transitions towards agroecology will inform the next steps in developing an implementation plan for the European Network. The next steps in developing an implementation plan relate to the governance of the European Network. Building on the improved understanding of the added value, key factors for the sustainable long-term implementation of the European Network will be analysed. This will entail learning from other existing networks of networks in the European agricultural and rural development arena (with particular attention being paid to funding strategies and the role of co-funding through public and private funding). The suitability of different governance elements will be reviewed with the Pilot Network in WP3.

1. Introduction

ALL-Ready is a Coordination and Support Action (CSA) funded by the European Commission (EC) with the aim of preparing a framework for a future European network of Living Labs (LL) and Research Infrastructures (RI) that will enable the transition towards agroecology throughout Europe. Based on the premise that agroecology can strengthen the sustainability and resilience of farming systems, such a European Network is expected to contribute to addressing the multiple challenges that farming systems are facing today including climate change, loss of biodiversity, dwindling resources, degradation of soil and water quality as well as the social and economic dimensions of sustainable and resilient agroecosystems.

The vision for building the network of living labs and research infrastructures for agroecology transition (co-created with stakeholders at the beginning of the project) highlights the ambition to support farmers and other actors involved in transitions to agroecology in better understanding, implementing and outscaling agroecological principles and practices. This is to be achieved through promoting transdisciplinary, participatory, inclusive and coordinated experimentation in real life settings, ensuring knowledge exchange at European level, and delivering series of long-term data on ecological, economic and social processes of transitions to agroecology in diverse conditions across Europe (Mambrini-Doudet *et al.*, 2022). This requires an improved understanding of the operational challenges, needs and experiences of LLs and RIs engaged in research and innovation processes in different European farming and food systems in different stages of transitions to agroecology (subsequently referred to as community of agroecology LLs and RIs) to fully utilise the potential added value of such a European network.

This document is Deliverable D4.1 in the Work package (WP) 4 “Implementation and Sustainability of the Network”. WP 4 aims to provide an implementation plan that ensures the added value and sustainability of the European Network of LLs and RIs capturing and promoting long-term processes of transitions to agroecology. In particular, this report includes the results of Task 4.1 “Identification of the added value of the European Network”.

The analysis carried out for Task 4.1 focused on the challenges and needs in the community of agroecology LLs and RIs and the potential benefits they expect from a European Network. The analysis builds on the conceptual framework developed by Mambrini-Doudet *et al.* (2021) and Gödel *et al.* (2021) in WP1, and the guidance and plan for stakeholder engagement developed in WP3 (Bijttebier *et al.*, 2021).

The overall objective of this Deliverable (D4.1) is to improve the understanding of the potential added value of a European Network of Living Labs and Research Infrastructures in addressing key challenges of the community of agroecology LLs and RIs and promoting transitions towards agroecology.

The specific objectives of Deliverable 4.1 are:

- To analyse and synthesise key challenges and needs in the community of agroecology LLs and RIs and the potential benefits they expect from a European Network based on the mapping activities in WP2, pilot network workshops in WP3 and additional empirical data collection done through interviews with a selection of LLs, RIs, other open innovation arrangements (OIA) and funding organisations.
- To synthesise the potential added value of a European Network of Living Labs and Research Infrastructure and its contributions to key activities and values of transitions to agroecology.

The short report is structured as follows:

Section 2 provides definitions on key terminology and describes the synthesis approach of integrating findings from the different WPs and the engagement and data

collection with agroecology LLs, RIs and funding organisations specifically done through interviews in Task 4.1.

- Section 3 provides the synthesis of the challenges, needs, funding strategies, and expectations, and integrates the different perspectives on the added value of the European Network from LLs, RIs, OIAs and funding organisations.
- Section 4 integrates the different perspectives on the added value of the European Network and summarises key activities and values in transitions to agroecology the European Network can deliver added value for.
- Conclusions are reported in Section 5.

2. Research methods and data

2.1 Overview of research design and integration within the overall project concept

Agroecology is widely recognised as an integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of farming and food systems, recognising the importance of networking through partnerships and other forms of cooperation as key elements to maximise synergies, and reduce trade-offs that occur in natural and human systems (FAO, 2018).

Networks can be considered as a set of relationships among entities (Jansen and Wald, 2007). Social networks are formed by social entities (persons or organisations) that are linked through any kind of relationship, such as communication or the exchange of resources (Wasserman and Faust, 1994), with mutual trust and reciprocal relationships playing a key role (Vanni *et al.*, 2019). The existence of a network increases the probability of interactions between network members and in contrast to other organisational forms, networks enable bilateral and multilateral relationships, including interactions in a two-way relationship (Marquardt, 2013), which, for instance, fosters the knowledge transfer, capacity building and co-learning about innovative solutions for advancing transitions to agroecology.

Networks are found on all scales, within and between organisations, and can vary in visibility (Davies *et al.*, 2005). Agroecology LLs and RIs represent networks of their participating actors and operate at different scales (e.g. local, regional and national). We therefore understand the foreseen European Network of Agroecology as a network of networks gathering and transferring knowledge from LLs, RIs and OIAs with the main aim to accelerate transitions to agroecology (Mambrini-Doudet *et al.*, 2022). Similar network of networks relationships exist in the European agricultural and rural development arena. For example, National Rural Networks (NRNs) are interlinked with the European Network for Rural Development (ENRD), which shall ensure networking at the community level between NRNs and other stakeholders such as farmers' associations or Local Action Groups (LAGs) (Marquardt *et al.*, 2011; ENRD, 2022).

Conceptually Task 4.1 built on the vision and conceptual framework developed in WP1. The ALL-Ready concept for fostering transitions to agroecology specifies main categories of activities and policy incentives that could strengthen the transition. These categories are organised in two pillars, one dealing with the agroecosystem and environmental context and the second with the socio-economic and cultural context of agroecology transitions. The activities and policy incentives are underpinned by values (e.g. values of social and ecological justice) which represent drivers of the engagement of actors in the transition process redesigning agri-food systems towards agroecology. Values reflect the degree of importance

of a specific action (Mambrini-Doudet et al., 2021; Gödel et al., 2021). In addition, the various actors of the value chain (from seed producers to consumers) need to have specific skills and competences to successfully engage in agroecology, accomplished through training and knowledge sharing. An overview of core competences for accelerating agroecology transition is provided by Bijttebier *et al.* (2022). Task 4.1 examined the potential added value of the European Network in the context of the different activities, values and competences that can strengthen a transition to agroecology.

The concept and vision developed in WP1 also identified key roles and benefits of LLs and RIs in transitions to agroecology (e.g., for LLs: enlarging the diversity of actors involved in the transition process, empowering relevant actors through co-creation and intensive knowledge exchange; for RIs: making scientific knowledge on agroecology available for agroecology transition, contributing to understanding, analysing and promoting key aspects and benefits of transitions to agroecology). In order to fully utilise the potential of LLs and RIs in promoting transitions towards agroecology a number of challenges in the development and long-term management of these organisational structures need to be addressed. The mapping exercise done in WP2 provided first insights on key challenges for LLs and RIs, e.g.:

- Addressing low social capital and a limited cooperative culture in the design of LLs and RIs
- Complexity of applying systems and transdisciplinary thinking required to address agroecology transitions
- Institutional structures of LLs and RIs and lacking institutional setup around agroecology
- Short-term nature of many funding instruments with limited ability to foster long-term commitments and transitional processes

Task 4.1 then further explored the added value of the European Network of LLs and RIs in contributing to addressing those challenges and synthesised the insights on the added value of the European Network available from different WPs into Deliverable D4.1. This included insights into challenges and needs of LLs and RIs from the mapping exercise in WP2, the pilot network engagements in WP3 and the scoping of the capacity building programme in WP5. The insights from the other WPs informed the empirical data collection done through interviews on the needs and expectations of LLs, RIs, OIA as well as different private and public funding organisations across Europe. Particular attention was paid to the added value and synergies enabled by the development of long-term funding strategies (of the European Network) that combine funding sources from different levels and sectors. Table 1 provides an overview of the data collection and sources that informed the identification of the added value of the European Network in Task 4.1.

Table 1 Overview of data collection and sources for the analysis of the added value of the European Network

Method approach /	Key theme	Stakeholders involved	ALL-Ready data source
Mapping survey	Challenges, key barriers / drivers for LLs and RIs in AE transitions	NCPs (Policy, Research, NGOs)	WP2 (country reports and D2.3 – D2.5)
Pilot network workshops (including selection interviews)	Needs and expectations for pilot (European) network	Pilot LLs and RIs	WP3 (D3.2, workshop report)

	Needs for capacity building		WP5 (D5.1, D5.2)
Policy-maker survey	Needs for capacity building	Policy-makers	WP5 (D5.1, D5.2)
Online questionnaire	Activities, values and funding sources of LLs and RIs in AE transitions Basis for selection of LLs and RIs for interviews	LLs, RIs and OIAs across Europe	WP2 (on-going)
Interviews	Challenges, needs and expectations of agro-ecological community Needs and expectations of funding organisations	Selected LLs, RIs and OIAs in Europe (identified in WP2 questionnaire) Selected funding organisations in Europe	Task 4.1

2.2 Interviews with living labs, research infrastructures and funding organisations

The focus of the interviews in Task 4.1 was on further improving the understanding of the particular needs and expectations of different LLs and RIs and the funding organisations engaged in transitions towards agroecology. Key themes of the interviews were the challenges and needs, funding strategy and expectations and benefits from a European Network. In order to avoid thematic overlaps with the survey on capacity building needs of policy-makers, issues on competences and skills were excluded from the interviews with funding organisations. Table 2 provides an overview of the guiding questions that were discussed in the interviews carried out in the assessment of the added value of the European Network.

Table 2 Guiding questions for the interviews of initiatives and funding organisations

Dimension	Questions for LLs / RIs / OIA	Questions for funding organisations
Challenges and needs	Q1 - Which challenges did you have to overcome in setting up your LL or RI? (And how did you overcome those?)	Q1 - Which challenges did you experience in funding research and innovation actions in LLs and RIs? (Can you explain the particular problems and provide examples?)
	Q2 - Which challenges remain in the management and operationalisation of your LL or RI? Can you explain the impacts of these challenges on your LL or RI?	Q2 - What are your experiences with combining funding with public / private funding? (Can you explain any problems that arose and also synergies that could be observed?)
	Q3 - What are important competencies for the members of your initiative? (How do you think these competences can be further developed?)	Q3 - Can you identify particular issues that constrain the impact of your funding programme for policy, practice, science and society?
Funding strategy	Q4- What is your preferred method of raising capital? (And why have you chosen this approach?)	

Dimension	Questions for LLs / RIs / OIA	Questions for funding organisations
	Q5- Can you report good practices or good experiences with funding acquisition? Q6 - For which type of activities do you experience difficulties in funding? (Can you identify funding gaps?)	
Expectations and benefits	Q7 - What benefits do you expect from a European Network for "your" LL or RI?	Q4 - Can you think of or identify potential linkages between the activities your organisation is funding and a European Network of AE LL / RI? Can you explain?
	Q8 – Are there certain values and activities of the LL / RI that particularly depend on, or will be strengthened through, networking at European level?	Q5 - What benefits do you expect from such a European Network for your funding programme?
		Q6 - Can you identify possible synergies between your funding programme and European funding?
Contribution to funding the European Network		Q7 - Do you see a possible role of your funding programme in contributing to financing a European Network? (What activities could in principle be funded?)
		Q8 - What would be key requirements or preconditions to contribute to funding activities of the Network?

The semi-structured interviews were carried out via phone or online communication tools, such as Webex or Zoom, and recorded following the approval of interviewees. The interviews lasted on average around 90 minutes. Reporting templates were provided for consistent data collection across the interviews.

The selection of the initiatives (LLs, RIs and OIAs) and funding organisations for further in-depth data collection through the interviews built on the responses to the WP2 questionnaire. The selection criteria considered that the needs, challenges, funding strategies and expected benefits of different initiatives for a European Network are likely to differ depending on the level of experience and stage of development of the initiative, the different barriers and drivers that need to be addressed in different stages of agroecology transitions, the access to and history of funding, the scope and complexities of multi-actor engagement, different agroecosystems / agri-food systems and the inclusion of examples from the different main geographic European regions. Responses from project partners and members of the pilot network were excluded from the selection pool to ensure new insights in addition to the data collected through the pilot network workshops (see Table 3 below). For funding organisations, the selection aimed at including private and public funding organisations. Such funding organisations were identified from the responses to the WP2 questionnaire and, in addition, interviewed LLs, RIs and OIAs were asked to suggest relevant funding organisations.

Overall 21 interviews were conducted covering 13 initiatives and 8 funding organisations (5 public and 3 private organisations). LLs were also invited to participate at a workshop of the Agriculture and AgriFood Living Lab Working Group in early spring 2022 to present and exchange experiences on key challenges and needs in relation to the governance and funding of their initiatives and the required competencies. Table 3 (a and b) provides an overview of the contributing initiatives and funding organisations and some of their key characteristics.

Table 3a Overview of initiatives and funding organisations which participated in the interviews and sessions at the pilot network workshops

Name of organisation	Type of organisation*	European geography	Main funding sources	Form of engagement**
INNOFOOD HUB (Vytautas Magnus University)	LL	Northern (LT)	Mainly national public	Interview
Mære agricultural high school	LL, RI	Northern (NO)	Mainly national public	Interview
Carbon Farm	LL	Northern (DK)	National public, international private, paid services	PN workshop
LatHort	LL, RI	Northern (LV)	Mainly national public	Interview
Consorzio ARCA	OIA	Southern (IT)	European and regional public	Interview
Menter a Busnes	LL	Northern (UK)	Mainly national public	Interview
Innovative Farmers	LL	Northern (UK)	Charitable funds, national and local private	PN workshop
Institute for Sustainable Food	RI	Northern (UK)	National public	PN workshop
Inagro (several initiatives)	RI	Western (BE)	European and national public, paid services	Interview
Agrotopia	LL	Western (BE)		Interview
ÖMKi On-Farm Living Lab	LL	Eastern (HU)	European and national public, with international private	PN workshop
PA4ALL	LL	Southern (SR)	Mainly European and national public	PN workshop

American Farm School Thessaloniki	OIA	Southern (GR)	Mainly national and local public with national private	Interview
EMPHASIS	RI	Western (DE, Network several MS)	European and national public, with international private	Interview
Research and Transfer Center for Organic Farming and Sustainable Regional Development	LL, RI	Western (DE)	Mainly national public with national private, paid services	Interview
LifeWatch ERIC	RI	Southern (ES)	European & national public, national and local private	PN workshop
CambioNet project	LL	Western (FR, Caribbean)	Mainly European public	Interview
Occitanum	LL	Western (FR)	National & regional public, national and local private	PN workshop
Normandy Living Lab (NLL)	LL	Western (FR)	Mainly national public	Interview
FiBL (several initiatives)	LL, RI	Western (CH)	European and national public, with national and local private	Interview
Agriculture and Agri-food Canada (several initiatives)	LL	Canada	Mainly national public	PN workshop

*Self-assessed, ** PN – pilot network

Table 3b Overview of funding organisations which participated in the interviews and sessions at the pilot network workshops

Name of organisation	Type of organisation*	European geography	Form of engagement**
Danish Ministry of Food, Agriculture and Fisheries	PU-FO	Northern (DK)	Interview
Local Action Group (Gruppo di Azione Locale) in Sardinia	PU-FO	Southern (IT)	Interview
Flemish Land Agency	PU-FO	Western (BE)	Interview
Captain Vassilis & Carmen Konstantakopoulou Foundation	PR-FO	Southern (GR)	Interview
Federal Scheme for Organic Farming (BÖL)	PU-FO	Western (DE)	Interview
Fondation Carasso	PR-FO	Southern (ES)	Interview
French National Research Agency	PU-FO	Western (FR)	Interview
Banque des Territoires	PR-FO	Western (FR)	Interview

*PU-FO: Public funding organisation; PR-FO: Private funding organisations

adoption, long-term sustainability, stakeholder engagement (with the need for communication and social skills, competencies and positive and constructive mindsets highlighted) and the understanding and application of the living lab methodology, data management and ownership, and access to funding and funding gaps.

Maintaining innovations and overcoming barriers of adoption

A key challenge frequently mentioned by initiatives is to stay innovative by addressing social and technological innovations and new or improved management practices considered innovative by academia (e.g. in relation to water management, biodiversity, and soil health), while maintaining long standing research programmes to develop practical solutions including farmer-led research, on-farm trials and field experiments (e.g. plant breeding, intercropping, weed management, and new pesticides and fertilizers) (e.g. Inagro, Innovative Farmers). Initiatives reported a need to document and measure effects of the new practical solutions (e.g. treatments and practices) to enhance knowledge and raise awareness of their sustainability benefits (including potential economic effects at farm level, e.g. cost savings) (e.g. AAFC).

Combining research innovation with practical solutions for users is seen as particularly challenging in cases where project governance and administration does not enable regular monitoring and revisions of project objectives and outcomes. The initially planned outcomes might not be relevant anymore for users (e.g. American Farm School Thessaloniki).

Furthermore, bureaucracy in project administration is sometimes too high and rigid (also at national level). This is not only the case for researchers, but also for other stakeholders involved in LLs. More flexibility to account for changes in the work and outcomes as well as being able to pay for services provided by farmers (including on-farm experiments) and other key actors is needed (e.g. Lathort, ÖMKi On-Farm Living Lab). Another challenge relates to the management of multiple LLs accounting for differences in actor compositions and activities (Occitanum).

Some initiatives, in particular research infrastructures, experience challenges related to interdisciplinary teamwork between researchers from different disciplines required to deal with high level of technological and analytical requirements of experiments, applying a common language and understanding and adapting to different contexts (e.g. Emphasis). Intergenerational aspects in farm management also need to be addressed, combining traditional knowledge with the readiness for adopting innovations of younger farmers who are moving back to the rural areas (with new attitudes) (e.g. Innofoodhub).

Long-term economic sustainability and accounting

Initiatives expressed challenges related to obtaining funding during the entire trajectory of the LL and ensuring its economic sustainability (e.g. Agrotopia, Consorzio ARCA, Cambio Net, Research and Transfer Center for Organic Farming and Sustainable Regional Development, American Farm School Thessaloniki, Emphasis). Communicating the use of funds to funders represents an additional challenge (e.g. Menter a Busnes). Resilience against pandemics and crises such as the COVID-19 pandemic was a challenge for the maintenance and the operationalisation of research and innovation activities of several initiatives (e.g. Menter a Busnes, Consorzio ARCA, Agrotopia). It impacted on the project delivery and the lock-downs made it impossible to carry out activities and measurements. These challenges were overcome through flexibility to extend programmes. Another challenge related to getting farmers to understand that they had access to this kind of support as a group. Therefore, innovation brokers in LLs acted as facilitators and fostered knowledge transfer.

End-user engagement and collaborations

A common challenge agroecology LLs and RIs are facing is to encourage end-users (primarily farmers and smaller companies) to take part in the initiative. This applies in particular with

respect to farmers who are less innovative in an agroecology context, and less willing to adopt agroecological practices. At the same time engagement and involvement of the most innovative farmers must be carefully designed and agreed without overburdening them (e.g. Agrotopia, Maere agricultural high-school, Innovative Farmers, Occitanum, Lathort, Innofoodhub).

Another difficulty is to convince farmers to shift to agroecological practices due to a lack of knowledge and awareness of economic and market opportunities of agroecological farming (e.g. Inagro). This, however, was seen less as a problem of lacking information but rather to improve access for farmers to the available information (which again highlights the role of innovation and knowledge brokers). Convincing farmers to test new practices on their own fields, practice research with farm businesses in a group setting and sharing information while ensuring confidentiality are additional challenges (e.g. Inagro, Agrotopia, American Farm School Thessaloniki, PA4ALL). In addition, in particular smaller farms lack the resources and have limited willingness to collaborate (e.g. Innofoodhub). To overcome this challenge, in some cases participating farmers are paid by compensating for yield reductions (e.g. Inagro).

One of the main challenges in establishing LLs were related to engaging and convincing stakeholders that there are opportunities in collaborating, funding, and strategic thinking. Even though when a larger number of stakeholders is involved in a LL or a similar initiative, the level of information sharing between stakeholders can be insufficient. Some stakeholders or companies are more hesitant to share information and data with a group. The development of trusted relationships between the stakeholders is a long-term process and requires good soft and social skills of facilitators and coordinators of the initiatives (e.g. Occitanum, American Farm School Thessaloniki, PA4ALL).

Understanding and applying Living Lab concept and methodology

LLs are new to researchers, not really known in agriculture and among stakeholders. The uncertainty about the approach results in a reluctance to engage and cooperate, which needs to be addressed (e.g. ÖMKi On-Farm Living Lab, AAFC, Innovative Farmers). Until now, not many relevant methodologies for LLs existed for agricultural production systems (compared to the IT or elderly care sectors), which has led to challenges in the operationalisation of, in particular early, agroecology LLs. New methods had to be developed for agricultural production systems through trial and error on how to build an environment of trust with farmers and innovation companies, and how to communicate with a larger pool of stakeholders, including scientists from different disciplines, to reach a common understanding of key issues and concepts (e.g. Agrotopia, Consorzio ARCA, Cambio Net). LLs can therefore benefit from improved structuring, e.g. through steering groups, new governance mechanisms, and more efficient communication with, and delivery to, partners (Innovative Farmers).

Applying the LL concept for transitions to agroecology necessitates a move from practice-based thinking to system thinking (e.g. AAFC). It was highlighted this requires close collaboration between social and natural sciences and the need for further awareness raising amongst funders and scientists on the importance of involving and funding socioeconomic aspects (e.g. Research and Transfer Center for Organic Farming and Sustainable Regional Development). Strengthening systems thinking is seen as a key theme for capacity building, e.g. for fostering the development and improved governance of local food systems in agroecological transitions (e.g. Inagro, Agrotopia, American Farm School Thessaloniki).

Locality and scale of a living lab can be challenging. For example, solutions for value chains and market development for transitions to agroecology might not always be local and actors to be involved might come from different areas. Also, some of the wider ecosystem services, and related users, might require a wider coverage of a living lab, which can make the management more complex and challenging (e.g. American Farm School Thessaloniki).

Challenges related to skilled labor needs

There is a need for more knowledge on the concept of agroecology through qualified human capital (e.g. Consorzio ARCA, Maere agricultural high school). A particular challenge in relation to skills is linked to the interdisciplinary nature of experiments and analysis (e.g. Emphasis). Moreover, the experience was reported that the young generation of scientists is less keen on working in the field conducting field trials. Competition with the private sector reduces availability of skilled researchers. Salaries in the private sector are higher (e.g. Lathort).

Challenges related to data management

Several initiatives reported challenges around managing data within LLs and RIs, lack of data sharing and use of data platforms (e.g. Occitanum, AAFC, ÖMKi On-Farm Living Lab, LifeWatch). LifeWatch expressed the challenge of designing tools for LLs and RIs and the collection of sufficient data to validate and test them. Occitanum stresses the need to develop full innovative digital tools for assessment (e.g. Life Cycle Assessment, Social Life Cycle Assessment, Strategic Environmental Assessments). Another challenge can relate to ownership of data. Conflicts can arise on open access and sources of data and data property rights (e.g. American Farm School Thessaloniki).

Access to funding and funding gaps

Access to funding is a common challenge for most LLs and RIs. One challenge for instance is to successfully integrate LL activities into applications for Horizon Europe research and innovation funding programmes, due to high competition for these programmes. The Horizon Europe programmes provide more substantial amounts of funding than local programmes (e.g. Agrotopia). But some initiatives also stress that accessing funding from European programmes is more challenging due to lack of time and resources (e.g. Research and Transfer Center for Organic Farming and Sustainable Regional Development; Innofoodhub).

More specifically in the UK context, BREXIT has implications on the availability of funding (sources). LLs and RIs in Wales have no further access to EU funding next year and will be entirely reliant on Welsh government funding. Uncertainty remains regarding the level of funding that will be available (e.g. Menter a Busnes).

Moreover, a number of initiatives have highlighted specific funding gaps. These relate to long-term funding and funding for follow-up activities and management of the LLs after an initial round of project funding. Funding gaps are also frequently an issue for practice partners on the ground (lack of eligibility of practical business-related activities). Companies that are developing technological innovations get funding in the beginning of the development, but they lack funding in the product launch phase. As a consequence, many solutions don't get launched, due to lack of funding for testing and demonstration as well as risk aversion (e.g. Maere agricultural highschool). In addition, initiatives highlighted the need to find ways to fund farmers for their expertise and on-farm experiments (e.g. Innovative Farmers, ÖMKi On-Farm Living Lab). Important funding gaps also exist for training, demonstration and fostering social innovation (e.g. Cambio Net, Innofoodhub).

Others report that the financial situation in science is difficult with funding availability declining. Low level of basic funding proves to be challenging for maintaining the RIs (e.g. greenhouses, laboratories and collection orchards) and costs for maintaining these are increasing (problem of higher energy costs) (e.g. Lathort). In parallel to project-related funding for carrying out specific research and innovation actions, long-term funds are needed for financing permanent staff members to manage and maintain research infrastructures and networks (e.g. Emphasis, American Farm School Thessaloniki).

3.1.2 Challenges faced by funders

The need for a stronger consideration of funding the long-term management of living labs and research infrastructures is mirrored in the responses of the funding organisations. Main themes of challenges and needs from the perspective of funding organisations are the funding of networking activities and long-term management, communication and capacity building, relevance to end users, political and private interests, and cooperation and coherence between funds.

Funding of networking activities and long-term management

The timing of co-financing is a challenge for some initiatives because it is not always aligned to duration and administrative requirements of their own funding programmes which makes administrative management more difficult (e.g. Gruppo di Azione Locale). Another challenge is that research projects are usually funded for a period of 4 years, while LLs are (in most cases) long-term commitments and processes. Funding of transdisciplinary networks and their long-term management would require flexibility to adjust funding contracts and being clear about the network governance and related roles and responsibilities (e.g. Danish Ministry of Food, Agriculture and Fisheries, BÖL). Also, maintaining dynamic interactions in the long-term can be challenging, in particular with actors who are new to co-creation processes. If however this can be achieved, then cooperations between distant players (regionally, thematically) can be witnessed (e.g. Banque des Territoires).

Challenges of long-term management also apply to RIs, e.g. with respect to maintenance and renewal of their infrastructure elements. A long-term strategy for funding is very important, as it can be very expensive to maintain the infrastructures (e.g. to keep technologies for remote-sensing up to date) (e.g. French National Research Agency). A skilled project manager is needed who is managing and coordinating the network (e.g. Banque des Territoires).

Communication, facilitation and capacity building

Some funding organisations such as the Fundacion Daniel y Nina Carasso experience communication as the main challenge of the funding programme. For example, because sustainable food is not considered mainstream in Spain, it is difficult to attract wide-spread attention. One specific challenge is related to the fact that the organisation operates within an environment that is already aware of issues around sustainable food, without managing to break out of this circle and go further. Together with a growing polarisation in Spain, sustainable food is deemed an object of activism and is therefore not taken into consideration.

Funding organisations also stress that research should be aimed at creating impact and not at fulfilling researchers' ambitions (e.g. Captain Vassilis & Carmen Konstantakopoulou Foundation, Fundacion Daniel y Nina Carasso, BÖL). To create such an impact, it is necessary to be communicative and disseminate information beyond the transfer of knowledge. The concept of sustainable diet must reach both the population to create collective awareness, and the politicians who promote policies for its regulation. However, this is complicated by the fact that the language used is far removed from popular language. On the other hand, the dissemination of scientific papers is also limited (e.g. Fundacion Daniel y Nina Carasso).

Capacity building (or the lack of) was identified as a factor that constrains the impact of funding (e.g. Captain Vassilis & Carmen Konstantakopoulou Foundation). Topics and areas of capacity building needed are technological knowledge but also knowledge about policy priorities and strategic objectives.

Relevance to end users

Ensuring relevance of activities and outcomes to end users was reported as an important challenge (e.g. Gruppo di Azione Locale, Captain Vassilis & Carmen Konstantakopoulou Foundation, French National Research Agency). This also implies that all the relevant information shared in a proper way (e.g. Banque des Territoires). From a partnership point of view, it was a challenge to run a programme and its activities through online meetings in rural areas where networking and technological education is lacking. Funding organisations stressed that developing practical solutions is a key aspect to ensure relevance for end users, which requires the involvement of farmers and citizens in identifying research topics (e.g. BÖL). Funding organisation acknowledged that they have an active role in facilitating the end user relevance of the activities and outcomes of LLs and RIs by, for example, linking academic with applied research (e.g. Captain Vassilis & Carmen Konstantakopoulou Foundation).

Difficulties are reported for engaging smaller stakeholders such as farmers in an agroecological project who have to do extra work with which they are often not familiar with (e.g. Danish Ministry of Food, Agriculture and Fisheries). At the farm level, some funding organisations acknowledge the difficulty in changing farmers habits. The number of farmers interested in funding to change their system is an additional constraint to the impact of research and innovation activities from the bottom up. Few farmers are willing to change their business model (e.g. Flemish Land Agency).

Political and private interests and support

Funding organisations also indicated negative impacts due to the fact that rural development is apparently of relatively low priority and therefore of limited political interest but is nonetheless crucial in regions which are largely classified as rural (e.g. Gruppo di Azione Locale). Funding dedicated to supporting agri-environmental issues has to be approved by the Ministry of Agriculture, representing a constraint due to rigid top-down governance of funding (e.g. Flemish Land Agency). In addition, the overall political environment and higher-level political objectives (e.g. to reduce state debt) can create uncertainty for the budget availability and might result in budget cuts, despite interest in agroecological research and innovation. Political support and agreement of the government is therefore a crucial requirement to provide and secure governmental funding.

Cooperation and coherence between funds

Financial support from large companies (e.g. from the seeds and retail sectors) can be an important element of a funding strategy for LLs and RIs. This is in particular important for those organisation that are not eligible for a funding rate of 100% from public funding sources. Creativity is required to find other private funding solutions for the rest of their planned budget (often around 40%). Therefore, it is important to have companies on board (private funding) to cover substantial parts of the needed financial background (e.g. Danish Ministry of Food, Agriculture and Fisheries, Banque des Territoires).

Public funding organisations report a challenge related to risk aversion in investments due to the Covid-19 pandemic. Before the pandemic, companies were more willing to take risks and invest. The reduced willingness of private funders to invest in agroecology transitions contributes to a lack of co-financing (e.g. Gruppo di Azione Locale). Private funding organisations acknowledged a lack of private funding within the community of agroecology LLs and RIs and saw their role in contributing to addressing that gap. There is complementarity with public funding, as the private funding can be used for ground-laying activities, setting up studies and enable actors to successfully apply for public funding (e.g. Captain Vassilis & Carmen Konstantakopoulou Foundation).

Generally, there is a need for more cooperation between the funding programmes (e.g. CAP and Cohesion funds) to increase coherence between funds. Another challenge reported in relation to funding is to increase the number of external funding entities for rural

development. In this way more independence from governmental regional funds can be achieved, that are deemed less functional due to internal political challenges in the region (e.g. Gruppo di Azione Locale).

3.2 Expectations and benefits

3.2.1 Expected benefits for LLs, RIs and OIAs

Knowledge Exchange: Learning and teaching

The main benefit agroecology LLs and RIs expect from a European network is the possibility of improved knowledge exchange through networking and capacity building activities, learning from the experiences of other initiatives and peers (e.g. Inagro, Agrotopia, Consorzio Arca), for example on setting up and running a living lab, on financial aspects, on systems thinking (e.g. Maere agricultural high school), on organisational aspects and key concepts of agroecology and improved and effective governance of LLs (e.g. Cambio Net), and by funding peer-to-peer learning in international exchanges (e.g. Menter a Busnes).

Participation in the network can foster relationships and increase social capital, and facilitate knowledge exchange on processes of transitions. This improved knowledge of processes can then help to address site-specific questions. Mature social capital is critical for the institutional changes in new knowledge networks. Low social capital requires higher levels of coordination, which emphasises important facilitating roles of trusted intermediaries in the network. It is important that a European Network pays attention to site-specific and local context. Knowledge exchange and transfer needs to focus on complementarities and acknowledge the differences across different local contexts (e.g. Research and Transfer Center for Organic Farming and Sustainable Regional Development).

International contacts are deemed essential to translate innovative ideas and best practices into the local context. LLs and RIs can also benefit from research done in other universities and institutes with more budget and knowledge on fundamental research aspects. For example, initiatives reported successful learning experiences on systems thinking with the new knowledge now being transferred to farmers (e.g. Inagro). Initiatives can benefit from learning from international experiences in order to improve their impact and performance at national level and also contribute to advancing the transition to agroecology in other European countries, by sharing evidence from long term field experiments on specific topics (e.g. agroforestry field trials show results after 5 to 10 years) (e.g. Inagro, Maere agricultural high school).

A European Network is expected to address difficulties experienced with adding international partners to EIP Agri operational groups. Benefits of a European Network are suggested in enabling and strengthening closer international collaboration on very practice-oriented innovation and research actions, with an important role in mainstreaming innovations (e.g. American Farm School Thessaloniki).

Synergies are also expected from a European Network in improving the linkages and collaboration between different scientific disciplines thus strengthening interdisciplinarity in RIs, i.e. better understanding how to utilise synergies between different ecological, social and economic processes in transitions to agroecology. It is expected that the Network has potential to foster linkages of ecological studies with the food systems perspective. Benefits are also expected in terms of improved linkages between Western and Eastern European scientists creating synergies in the expertise and experience, e.g. on plant breeding programmes. This bridging role is seen as important (e.g. Emphasis, Lathort).

Increased visibility for funding and enhanced activities

Some LLs also expect to gain more visibility at European and international level, which is expected to strengthen their position in acquiring project funding (e.g. Agrotopia). Moreover, particularly activities related to agroecology could be strengthened through the European Network. This applies in particular to initiatives with little experience in agroecology, for example organisations that have only recently expanded their activities into the agricultural sector (e.g. Consorzio Arca). Access to more specific knowledge and benefiting from the experience from other members of a European Network would result in better funding opportunities. Increased funding opportunities for young researchers and PhD funding at EU and national levels were also identified (e.g. Cambio Net, Research and Transfer Center for Organic Farming and Sustainable Regional Development, Lathort). Increased visibility of companies participating in LLs can potentially also open up or improve access to international markets (e.g. Maere Agricultural high school).

Stronger engagement of actors in agroecology transitions

The European Network can increase the awareness of topics and impacts of transitions to agroecology increasing the knowledge on the sustainability and societal benefits of farming and food systems for wider society. This is expected to increase motivation of non-farming actors to engage in transitions (e.g. Research and Transfer Center for Organic Farming and Sustainable Regional Development).

There is also an expectation and need for the Network to reach out and collaborate with schools and educational organisations and in particular with EIP Agri and its operational group. This would allow synergies and complementarities with EIP Agri. It would increase knowledge about results and solutions developed on farms and business incubators (e.g. American Farm School Thessaloniki).

3.2.2 Expected benefits for funders

Strengthening international networks

Some funding organisations highlighted that while local and regional networks were well developed, international networks have not been developed yet and also stressed that their funding requirements generally excludes funding for international research (e.g. Gruppo di Azione Locale, Fundacion Daniel y Nina Carasso). Developing and funding a network of agroecology LLs and RIs would therefore have added value and be complementary to their funding strategies.

A European network could also include regional modules such as a "Mediterranean coalition" which focuses on exchanging knowledge on common issues, challenges and best practices in the European South (e.g. Captain Vassilis & Carmen Konstantakopoulou Foundation). The modules may account for differences in cultures, environmental conditions, especially in terms of climate change, and funding practices. This differentiation would allow comparison and analysis of the diversity of behaviours of farmers and other involved actors (e.g. French National Research Agency) and thus to learn from this diversity.

Because of the increasing number of topics being addressed in research and innovation in agroecology transition, an expected benefit of the network would be to collaborate and share expertise on a European level. This could provide participants with improved access to knowledge and different resources (e.g. Banque des Territoires). Closer collaborations or even co-creation between participants of different projects and within a possible European network can not only eliminate duplication of work but also share knowledge on needs, problems and solutions (e.g. Danish Ministry of Food, Agriculture and Fisheries). Exchanging staff can help learning from experiences in other contexts, which results in improved personal skills and higher quality activities (e.g. BÖL).

Enhanced activities and extended impact

Moreover, extended impacts relate to joining forces to make research on sustainable farming and rural development more visible and to increasing the voices and lobbying of the community of agroecology LLs and RIs. The European Network would have particularly high value added if it is able to reach the entire value chain, not only farmers, but also advisors, banks, the department of agriculture, suppliers, seed production, agrochemical companies, retailers and consumers (e.g. Flemish Land Agency, Banque des Territoires). Cooperation in a network increases the potential to better address value chain issues that would facilitate outscaling the adoption of practices and mainstreaming innovations, e.g. improving quality standards and improving access to markets (e.g. Captain Vassilis & Carmen Konstantakopoulou Foundation).

Possible contributions of the interviewed organisations to the funding of a European Network would include the development of practical solutions to environmentally friendly farming processes and activities on social aspects of sustainable farming. This can be linked to funding networking activities, the application of developed solutions on the ground, engagement of farmers as well as social elements of transitions, also linked to wider rural aspects (e.g. Captain Vassilis & Carmen Konstantakopoulou Foundation).

Furthermore, France for instance would be interested in the comparisons of conditions across Europe, exchange of knowledge, monitoring and training (e.g. French National Research Agency). It is considered that the budget and funding possibilities are not the main issues of the transition in France. Nonetheless, research is seen as lacking in innovation for new or better practices (indicated by a relatively low number and quality of proposals that are submitted to funding calls).

Additional diversity and synergies of funding

Diversity and specificity of funding are important added values of the European Network, as they allow to implement partnerships at a local level with LL (e.g. Gruppo di Azione Locale). For instance, in Sicily from the point of view of the rural action group or rural district, characterisation of territories is heterogeneous with four very different historical regions. There are also extremely different areas of production and communities, which complicates their management. The European Network can foster partnerships of funding organisations, LLs and RIs in regions with similar contexts and challenges to jointly address and invest in thematic areas that can be important to reinforce the development of agroecological projects in the territory.

Funding organisations highlighted the importance of an overarching long-term strategy and frame for funding a European Network to avoid, or at least to minimise, double-funding of activities and projects which aim at addressing exactly the same questions and outcomes (e.g. BÖL, Danish Ministry of Food, Agriculture and Fisheries). A European Network can be an incentive and driver for increased co-funding between public and private funding sources.

3.3 Competences and skills

A capacity building programme will be developed in WP5 to improve the competences and skills of actors engaged in the community of agroecology LLs and RIs and the European Network (see Bijttebier *et al.*, 2022). Here, we briefly list a selection of key points on required competences and skills raised by the participating LLs, RIs, and OIAs, which will feed into the development of the capacity building programme. These are:

- Particular importance was given to a positive and constructive mindset and well-developed social skills and competences as part of the personal skill set, which are seen as key competences for transdisciplinary research and innovation action in LLs

and RIs (e.g. including encouraging other actors and members of LLs and RIs, acting as a team player).

- Capacity building needed on:
 - the concept of agroecology and its EU policy context
 - how to set up and run a living lab and / or research infrastructure
 - data management mainly, but not exclusively, in research infrastructures across different international sites, to improve analytical and methodological skills, ensuring high quality standards and common approaches of calibration.
- Further key themes identified for capacity building include:
 - the role of social innovations and how to foster social innovation,
 - communication skills, facilitation, mediation and addressing the challenge of potential conflicts on open access and sources of data,
 - nature conservation and agriculture, the use and importance of genetic resources,
 - socioeconomic aspects of organic and agroecological farming,
 - developing, engaging in and governing local food systems in agroecological transitions,
 - methods and concepts of policy analysis for transitions to agroecology.
- Capacity building needed on how to manage and govern a European Network including responsibilities and decision-making processes in such a network as well as options of involvement for LLs, RIs, OIAs and funding organisations.

4. Summary of the added value of the European Network

In summary, the participating agroecology LLs and RIs have expressed a variety of key challenges and needs related to the operationalisation and the management of their research and innovation activities (Figure 2). These relate to maintaining innovations and overcoming barriers of adoption, economic (long-term) sustainability, stakeholder engagement (with the need for communication and social skills and positive and constructive mindsets highlighted) and the understanding and application of the living lab methodology, and data management and ownership. Data related issues include lack of data sharing and the need for suitable common data platforms and conflicts regarding the data ownership and property rights. Particular challenges highlighted for research infrastructures relate to the interdisciplinary and long-term nature of experiments as well as to transboundary data management across research infrastructures in different countries.

Access to funding is a common challenge for most living labs and research infrastructures. Important funding gaps exist for training and demonstration and maintaining infrastructure and networks. In parallel to project-related funding for carrying out specific research and innovation actions, funds are needed for financing permanent staff members to manage and maintain research infrastructures and networks.

The need for a stronger consideration of funding the long-term management of living labs and research infrastructures is mirrored in the responses of the funding organisations. This could be potentially addressed by utilising synergies in combining public and private funding and improved coherence between different funds. However, funding organisations indicated cases of reduced willingness of private funders to invest in agroecology transitions in post-pandemic times. Further key challenges reported by funding organisations relate to the relevance of funded research for end-users, e.g. farmers and citizens, and the need for improved integration of applied and academic research.

Interviewed initiatives of LLs and RIs and funding organisations shared common views on key benefits they expect from participating and funding a European Network of Agroecology Living Labs and Research Infrastructures. For example, these include strengthened networking and collaboration (including regional networking modules or clusters), supporting long-term funding strategies, enhanced portfolios of research and innovation activities promoting synergies between different ecosystem functions, and strengthened knowledge creation, exchange and diffusion resulting in further improvements in organisational aspects of the living labs and research infrastructure, and thus more effective governance (Figure 2).

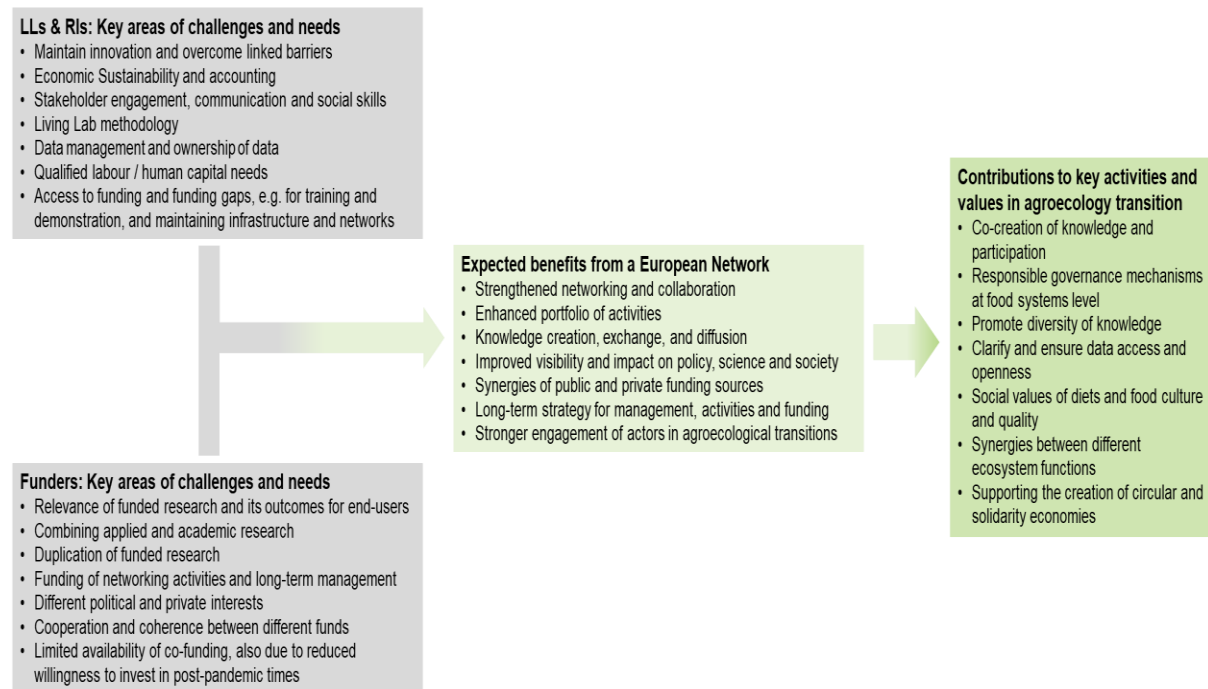


Figure 2 Synthesis of key challenges and needs of agroecology LLs and RIs, expected benefits from participating in a European Network and its potential added value

Strengthened networking and collaboration would promote co-creation of knowledge and engagement of stakeholders in transitions to agroecology. Such knowledge networks are likely to be effective in overcoming the barriers in knowledge transfer which individual farmers face, and helping to address barriers in relation to reliability, credibility, and trust (Feldman and Ingram, 2009). The co-creation facilitates extended roles of farmers as co-researchers and thereby encourages horizontal learning based on systems thinking (Frank *et al.*, 2022). Networks also improve the governance capacity of local farmers, by promoting the participation of the local community in planning, decision-making and implementation of the strategies for transitions to agroecology (Vanni *et al.*, 2019).

Large scale diffusion of agroecological practices also requires a range of actions from other food system actors, including initiatives that go beyond agricultural production to include processing and retail and that develop the demand side (Wezel *et al.* 2018; Moschitz *et al.* 2021). A main role of such a European Network was also seen in raising awareness of topics and impacts of transitions to sustainable farming and food systems for wider society (e.g. social aspects of access to healthy food), which has the potential to increase motivation of wider food systems actors to engage in LLs and transitions to agroecology. A number of studies have highlighted human health benefits of transitions to agroecology and the role and importance of dietary changes and the consumption of culturally significant foods (Bezner Kerr *et al.*, 2019; Barrios *et al.*, 2020; Frison and Clément, 2020, Rööß *et al.*, 2022).

Success stories can be promoted through the European Network, highlighting good practices of promoting social aspects of access to healthy food (e.g. Biological District of the Bolognese Apennines, Serra, 2022)

An important added value of a European Network would be to reach the entire value chain, from seed producers to consumers, promoting value chain solutions (e.g. improving quality standards and improving access to markets) and supporting the creation of circular and solidarity economies. Promoting the development of a fair and circular economy that reconnects producers and consumers and improves solidarity within sustainable boundaries is a key activity of the envisaged European Network of Agroecology LLs and RIs (Gödel *et al.*, 2021). Re-designing food systems based on the principles of circular economy can help address the global food waste challenge by making food value chains more resource-efficient. Social and institutional innovations play a key role in reconnecting producers and consumers (e.g. through producer-consumer associations, food policy councils and participatory guarantee schemes). More effective and responsible governance mechanisms at food systems level that enable transitions to agroecology are key to their prospects of success (Miller *et al.*, 2022).

There is the expectation for the Network to support participating LLs and RIs in reaching out and collaborating with schools and educational organisations, and to work in close collaboration with EIP Agri and its operational groups. This is to utilise synergies and complementarities (with EIP Agri) and to increase knowledge about results and solutions developed on farms and business incubators. Close collaboration with other networks in the European agricultural and rural development arena (e.g. the European Network for Rural Development) and with other Horizon Europe Partnerships and Missions will further enhance synergies, e.g. fostering knowledge transfer with the LLs and lighthouses of the Soil Mission Europe.

5. Conclusions and outlook

The overall objective of this report was to improve the understanding of the potential added value of a European Network of Living Labs and Research Infrastructures in addressing key challenges of the community of agroecology LLs and RIs and promoting transitions towards agroecology. The report analyses and synthesises key challenges and needs in the community of agroecology LLs and RIs and the potential benefits they expect from a European Network. It explored the added value of the European Network of LLs and RIs in contributing to addressing those challenges and its contributions to key activities and values of transitions to agroecology.

A European Network of Agroecology LLs and RIs is a major component of the partnership for agroecology and has the potential to support inclusive place-based innovation that accelerates the transition to agroecology at the local, regional and national levels across Europe. The main added value of the European Network lies in strengthening networking and collaboration that promotes co-creation of knowledge and engagement of stakeholders in transitions to agroecology, increasing knowledge and capacity of actors to successfully contribute to advancing transitions to agroecology, raising awareness of topics and impacts of transitions to sustainable farming and food systems for wider society, reaching the entire value chain promoting value chain solutions and supporting the creation of circular and solidarity economies, and increasing incentives for co-funding facilitating partnerships of funding organisations to jointly address and invest in thematic areas important to promote transitions to agroecology.

The complexity of the challenges to be addressed in farming and food systems in transitions to agroecology requires concerted and integrated efforts of science, practice and society,

and policy at European scale, which cannot be achieved only with relatively short-term research projects, or by a single country on its own. The European Network for Agroecology LLs and RIs can provide a coordinated, large-scale initiative that promotes knowledge transfer and capacity building on the development, uptake and upscaling of agroecology at different levels, paying attention to complementary experiences, insights and contexts at the local level. A main challenge to be addressed is the development and implementation of a sustainable long-term strategy and implementation plan for the governance, funding and activities of the European Network to contribute to effectively filling remaining knowledge gaps, while at the same time boosting real-life and place-based approaches. The European Network can capitalise on the advances of past and ongoing research and utilise the potential of agroecology and of local innovation to accelerate the transition towards sustainable, climate- and ecosystem-friendly farming systems in Europe.

The improved understanding of the potential added value of the European Network in addressing key challenges of the community of agroecology LLs and RIs and promoting transitions towards agroecology will inform the next steps in developing an implementation plan for the European Network, which relate to the governance of the European Network. Key factors for the sustainable long-term implementation of the European Network will be analysed. This will entail learning from other existing networks of networks in the European agricultural and rural development arena (with particular attention being paid to funding strategies and the role of co-funding through public and private funding). The suitability of different governance elements will be reviewed with the Pilot Network in WP3.

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