The Agroecology Partnership's SRIA

The Strategic Research and Innovation Agenda for the European partnership "Accelerating Farming Systems Transition: Agroecology Living Labs and Research Infrastructures"

Executive summary

AGROECOLOGY PARTNERSHIP

Co-funded by the European Union

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The overall purpose of this Strategic Research and Innovation Agenda (SRIA) is to define the general framework for strategic research and innovation activities to be undertaken under the future partnership "Accelerating Farming Systems Transition: Agroecology Living Labs and Research Infrastructures'' ("the Agroecology Partnership" hereafter). The partnership aims to promote a European large-scale endeavour for an agricultural sector that is fit to meet the targets and challenges in relation to climate change, biodiversity loss, food security and sovereignty and the environment, while ensuring a profitable and attractive activity for farmers.

It has been developed upon the mandate of the Standing Committee on Agricultural Research (SCAR) through its Strategic Working Group on Agroecology (SCAR-AE)2 which delivered at first a "partnership dossier"3. This consolidated SRIA is the outcome of two years of work involving over 300 professionals from different domains, and building on the efforts of the 160 participants in the seven tasks forces defined by SCAR-AE in 2021, the comments provided by different observers of the SCAR-AE, European initiatives, the European Commission, and other experts through dedicated meetings or consultations. A consolidated draft was submitted for public consultation from July to October 2022, and the comments received were incorporated into this version of the SRIA.

Its intended target groups encompass all the actors interested or involved in and impacted by farming activities and their relationships with the overall agri-food value chain. This includes individual farmers and their organisations, research performing organisations and research funding organisations, businesses related to the supply chain, consumers and citizens, and relevant local, regional, national, and European authorities.

Current agricultural production systems have achieved an increase in the productivity per land area relying on intensive practices and high input of agrochemicals and antibiotics that have often had negative impacts on the environment and on human and animal health. Value chains associated to these intensive modes of agricultural production depend on the specialisation of its actors and the delivery of a limited number of products. These highly intensive and input-dependent systems have driven the degradation of land productivity, water resources and soil health, biodiversity loss at multiple spatial scales, and made farming less resilient, while increasing its contribution to the emission of greenhouse gases. These adverse impacts have compromised the sustainability of food production systems, with associated social and economic implications.

At the same time, farmers are increasingly confronted with the uncertainty and consequences of climate change and must adapt to its diverse effects, while still ensuring the provision of food for an increasing world population. High temperatures, longer periods of drought and heat, increased late frost risks, pest outbreaks, increased heavy rainfall and extreme weather events jeopardise entire agricultural production systems. The current global context after the COVID19 pandemic and the Russian invasion of Ukraine have raised awareness on the relationships between health, food security, ecosystems, supply chains, consumption patterns and planetary boundaries, and the importance of locally and regionally produced and sourced food that decrease the dependence on non-EU imports, including agrochemicals.

[2] scar-europe.org

[3] https://research-and-innovation.ec.europa.eu/system/files/2022-04/european_partnership_for_accelerating_farming_systems_transition_march_2022.pdf

In the current context, farming systems are called to respond to the needs for affordable, sufficient, healthy and safe food, and other high-quality raw materials, as well as conserving resources and the environment, promoting biodiversity and increasing the provision of ecosystem services from farming activities, while ensuring a decent living for farmers.

There is increasing recognition that a major change is needed that would make the agricultural sector more sustainable, resilient, and responsive to societal and policy demands. This is highlighted in many policy documents and initiatives, ranging from the EU Environment Action Programme to 2030, the UN Sustainable Development Goals (SDGs) to the ambitious European Green Deal and the underlying strategies - Farm to Fork and the EU Biodiversity Strategy 2030, and the Common Agricultural Policy (CAP), among others. The latter documents highlight agroecology (AE) as a promising approach to support the transition towards more sustainable agriculture and it has become a priority for research under the EU's Research and Innovation Programmes Horizon 2020 (2014–2020) and Horizon Europe (2021-2027).

Agroecology (AE) is considered as the science of ecological processes applied to farming production systems, benefiting from the interplay of science, technology and traditional knowledge by farmers and stakeholders in value chains. It has the potential to contribute to environmental protection, healthier and more sustainable diets and a just distribution of benefits and burdens. Being based on a systemic understanding of farming which relies on learning from nature and ecology and using integrated principles, it has the potential to help address the above-mentioned demands. The full adoption of AE principles requires the implementation of incremental and transformational pathways involving agroecosystems and the entire food system, and encompasses economic, social, and environmental dimensions.

Achieving AE transition requires overcoming a series of bottlenecks and lock-ins related to R&I, policy, social and cultural, and economic domains, beyond the purely agronomic aspects. Accelerating AE transition requires a multi-actor approach to co-develop solutions and activities, design policies, and extend skills and capacities for the transformation of the overall agroecosystem. In the context of land-based primary production, increased attention to the context-specificity (spatial-bio-geographic, economic, and social) associated with agroecological practices is needed, which implies the search for knowledge-intensive solutions as standard agricultural solutions are inadequate. Increasing the spread of this type of approach poses challenges to the existing socio-technical aspects of our agricultural systems that need to be transformed through the implementation of a broad spectrum of innovations.

Living Labs (LLs) emerge in this context as an instrument providing the adequate long-term and user-centred framework for facilitating the co-design, co-development and rapid uptake of innovations tailored to specific locations (from practice to policies). The partnership will promote the establishment of a network of agroecology LLs across Europe to benefit from their particular experiences. Research Infrastructures (RIs) provide an appropriate environment for multidisciplinary research while helping to develop and implement relevant services and tools. They encompass the monitoring of pertinent biotic and

abiotic variables, and the evaluation of different scenarios of AE transition. Interdisciplinary and transdisciplinary training and innovation are also prominent activities of RIs. Matching RIs and AE LLs therefore has a great potential to enhance the creation and adoption of innovations, enabling their fast evaluation and their re-consideration whenever needed.

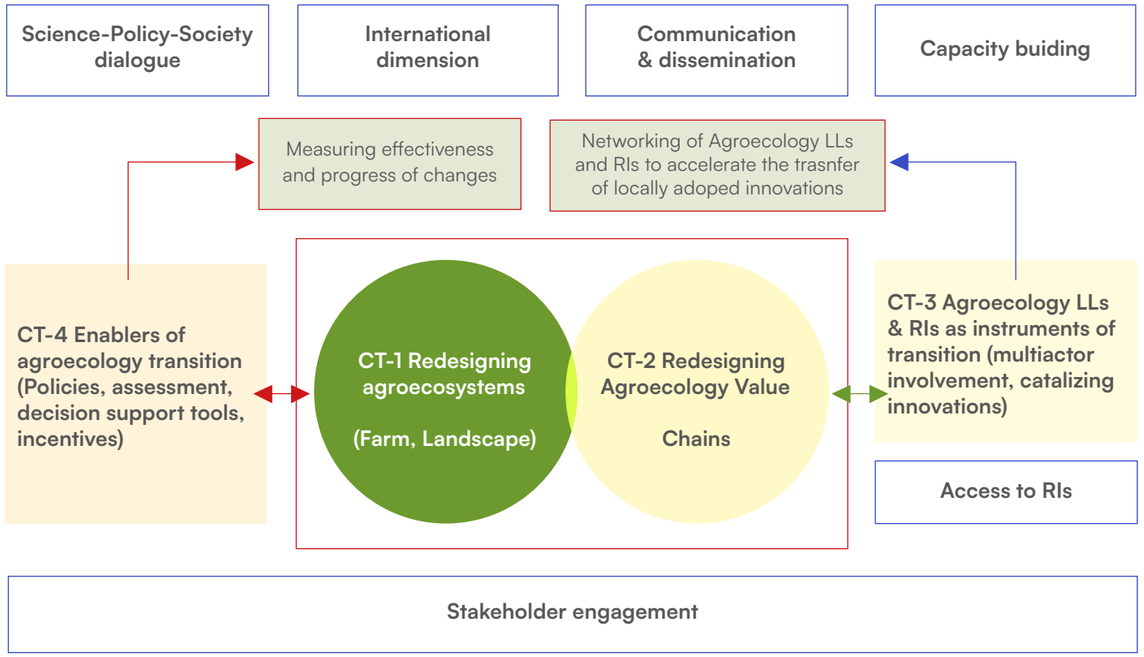
The Agroecology Partnership aims to coordinate and pool resources to lift lock-ins and enable and steer AE transition by integrating all relevant actors. It will provide the long-term and landscape perspectives needed to perform and test AE transition, by designing and implementing place-based innovations, setting the appropriate framework for improving knowledge on agricultural transition processes, and providing appropriate methodologies to steer, monitor and evaluate co-creation practices, transition outcomes, and their impacts. The Agroecology Partnership will also put in place mechanisms for science-policy dialogue in support of the establishment, implementation, and evaluation of evidence-based policies (research and sectoral) endorsing AE transition, including long-term funding for AE R&I.

The Agroecology Partnership relies on a common vision to team-up and unlock the transition to agroecology so that farming systems are resilient, productive and prosperous, place-sensitive, as well as climate, environment-ecosystem, biodiversity and people-friendly by 2050. Three General Objectives and their five derived Specific Objectives will contribute to achieving this vision, as shown in the figure below.

Vision	General Objectives	Specific Objectives
Team-up and unlock the **transition to agroecology** so that farming systems are resilient, productive and prosperous, place-sensitive, climate, enviroment-ecosystem, biodiversity-and people-friendly by 2050.	**GO1: Mainstream the principle** of AE to redesign farming systems across a diverse Europe. **GO2:** Build-up and expand **collaborations to co-create and share** knowledge and solutions that empower all actors (producers, consumers, policy makers, civil society) to engage in the AE transition **GO3:** Contribute to fulfilling the **Sustainable Development Goals and the Green Deal** targets by 230 and climate neutrality in Europe by 2050 by supporting the implementation of key EU strategies and policies.	**SO1:** Increase **research based knowledge** on the benefits and challengers of AE and its potential for farming, food, climate, ecosystem services and environmental footprint reduction as well as resource use and societal impacts. **SO2: Develop and co-create** innovations to reduce and share the risks of transition for both individuals and collectives. **SO3:** Improve the **sharing and access to knowledge** on AE as well as reinforce the **agricultural knowledge and innovation systems** for AE across Europe, considering culture, gender and youth aspects. **SO4:** Build a monitoring and data framework to measure progress of the AE transition and improve data valorisation and sharing. **SO5:** Exchange with policy makers (research and sectoral) and stakeholders on AE transition and mainstreaming of AE practices to contribute to improved governance, policies, and institutions.

The partnership will contribute to filling existing knowledge gaps on AE, promoting more open innovation and user-driven research on AE, addressing the wide geographical/territorial specificities in the EU through place-based approaches with long-term perspectives, and improving the sharing of knowledge within and across EU countries and beyond.

Deriving from the General and Specific Objectives, the following four core themes (CTs) have been identified in this SRIA to accomplish the Agroecology Partnership's vision and objectives, identifying the knowledge and the innovations that are necessary to accelerate AE transition in a consistent way, encompassing local, national and European scales. In addition, various supporting activities are proposed to ensure the impact of the research and innovation activities. The figure below shows the SRIA conceptual framework encompassing its CTs and supporting activities.



Core Theme 1

Redesigning agroecosystems – Under this core theme, the partnership will identify and test both suitable farming practices adapted to local conditions and appropriate landscape planning approaches aiming to reduce the use of agrochemical inputs through e.g. the closure of nutrient and energy flows, or the development of biological control methods, while enhancing landscape and agroecosystem biodiversity. The final aim of this CT is to increase the resilience of agroecosystems to climate change and extreme climatic events, while increasing

the provision of food, feed, fibre, biomass, and ecosystem services from farming. Socioeconomic aspects associated to the redesign of agroecosystems, and the development of decision support tools for farmers and advisors will also be covered by this CT.

Core Theme 2

Redesigning agroecology value chains. Activities under this core theme will focus on the adaptation of territorial/landscape value chains to the transformation of agroecosystems brought by the AE transition, through better understanding of farmer, market, and consumer linkages, with respect to agroecological products. It connotes the involvement of stakeholders, the provision of technological innovations and the construction of appropriate business models. Different scenarios must be constructed and assessed with the participation of the different stakeholders of those European districts/territories/regions engaged in AE transition, defining a common vision of the resulting landscape after the agreed interventions, and considering the potential associated socio-economic and environmental benefits and trade-offs. As is the case for other CTs, CT2 will build on the experience of the organic farming sector and cooperation with the Sustainable Food System candidate partnership is envisaged.

Core Theme 3

Agroecology Living Labs (LLs) and Research Infrastructures (RIs) as instruments enhancing multi-actor involvement for AE transition and the acceleration of creation and adoption of innovations. Activities deployed under CT3 will increase knowledge and understanding on the criteria the AE LLs and RIs should meet to accelerate AE transition and the methodologies, tools, governance, and organisational aspects supporting their operation. LL indicators need to be defined both for assessing their impact on AE transition and their individual performance. Research under this CT will also identify the enablers and drivers promoting the participation of the different stakeholders in LLs and RIs, and subsequently propose sound incentives to enhance their cooperation.

Core Theme 4

Enablers of agroecology transition. Activities under this core theme will address the research needs related to the enabling environment needed to accelerate the AE transition, such as the enhancement of coherence across sectoral policies and instruments, the development and implementation of decision support tools for policy- and decision makers, and the incentives to engage stakeholders in long-term initiatives. The development and assessment of conceptual frameworks, methodologies, and tools will also be carried out under CT4.

These four core themes are interconnected through cross-cutting activities aiming to provide a European perspective by capitalising on local experiences and outcomes. These actions involve the networking of AE LLs and RIs to accelerate the dissemination of locally adopted agroecology innovations to other areas, and the monitoring of effectiveness and progress of changes at the European level.

A series of supporting activities have been identified to inform, consult, advise, and involve different stakeholders to create capacity, raise awareness, and manage and exchange the knowledge and data created in the partnership's framework. These activities are related to stakeholder engagement, capacity building actions targeted to various actors, access to RIs, communication and dissemination, science-policy dialogue, and the partnership's international dimension. Mechanisms for science-policy dialogue in support of the establishment and implementation of evidence-based policies (research and sectoral) endorsing AE transition will also be developed.

The implementation of the partnership's activities should be facilitated by establishing synergies with other EU programmes and policies such as the Common Agricultural Policy, European Regional Development Fund, LIFE, and initiatives framed under Horizon Europe, such as missions, other partnerships, and EU and national research projects.

Given the global dimension of agroecology, the SRIA also considers the international context. Activities will promote dialogue at international level with the dual aim of gaining knowledge from useful experiences stemming from other continents and having an impact on the global scene. Potential cooperation opportunities with relevant platforms and initiatives have been identified. These include the FAO, the EU-African Union Research and Innovation Partnerships on Food and Nutrition Security and Sustainable Agriculture, the Latin-American Scientific Society on Agroecology (SOCLA), or the Transformative Partnership Platform on Agroecology. A mapping of potential international partners with the aim to add value to the partnership's activities will be performed.

This SRIA must be considered as a framework of agreed high-level ideas for thematic partnership priorities. It will be implemented through Annual Work Plans.

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