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Creating Conditions for Harnessing the Potential of Transitions to Agroecology in Europe and Requirements for Policy

Création de conditions pour exploiter le potentiel des transitions vers l'agroécologie en Europe et exigences des politiques

Schaffung von Bedingungen für die Nutzung des agrarökologischen Potenzials in Europa und Anforderungen an die Politik

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Introduction

The European Union's Farm-to-Fork Strategy sets out its ambitions and approach to how European's value food sustainability, and the accompanying opportunities for improving the environment as well as the lifestyles and health of EU citizens. It identifies the role of agroecological approaches in primary production as one of the means by which these ambitions can be achieved, through new knowledge and innovations in land management and supply chains. This article concludes the Special Issue on the EU Horizon 2020 projects LIFT and UNISECO, synthesising requirements for the realisation of transitions to agroecology in Europe. It reports the key needs identified of developing human capital, partnerships, cooperation and social capital, access to data and tools, and the links between these needs and relevant EU and national level policies.

Policy contexts for transitions to agroecology

Tackling climate change, loss of biodiversity and social inequalities is at the forefront of policy priorities at international, European and national levels. Commitments to achieving

objectives of the [UNFCCC Paris Agreement](#), the [Convention on Biological Diversity](#), and targets in the [UN Sustainable Development Goals](#) (SDGs) provide contexts of aspirations and expectations for policymakers at all levels.

At [COP26](#) (Glasgow, UK, November 2021) agreements were negotiated that 'keep alive the [Paris Agreement](#) target of limiting global warming to 1.5°C' (e.g. the [Declaration on Forests and Land Use](#)). The European Union (EU) [Green Deal](#) sets out ambitions for achieving net zero greenhouse gas emissions by 2050, with economic growth decoupled from resource use, and no person and no place being left behind. That ambition is also reflected in the EU [Long Term Vision for Rural Areas \(LTVRA\)](#) of stronger, connected, resilient and prosperous rural areas by 2040.

The [Common Agricultural Policy \(CAP\)](#) will be a key policy mechanism for achieving the Green Deal objectives ([Figure 1](#)). Agreement on its [reform](#), formally adopted in December 2021, 'paves the way for a fairer, greener and more performance-based CAP'. New provisions include replacement of current cross compliance and greening measures with an enhanced

conditionality scheme; and providing voluntary ecological payments in CAP Pillar I (ecoschemes). Five European countries (Germany, Netherlands, Spain, Switzerland and the United Kingdom) committed to the [Policy Action Agenda](#) for the Transition to Sustainable Agriculture. It requires them to design public policies that support food and agriculture production, enable transitions that are just, and respect and uphold the rights of all actors in farming systems and value chains in changing to new farm practices and a new structure of farming systems.

The [HLPE \(2019\)](#) examined how agroecology and innovative approaches to sustainable agriculture can contribute to transforming food systems and concomitant links to policy areas in climate change, biodiversity, human rights and inequalities. It identified needs for policy coherence across sectors (e.g. agriculture, environment, trade, energy, health, education, gender), strengthening knowledge systems and better use of learning outcomes in policymaking, and rebalancing investment between public and private sectors. Findings from the LIFT and UNISECO projects align with those conclusions, with evidence on the importance of understanding what

measures are most effective in agroecological transitions: human capital for exploiting that understanding, social capital and collaboration, data and tools for practitioners and policymakers, expanded upon below, and how these deliver in related policy areas.

Transitions to agroecology

Agroecological transitions are desirable shifts in reducing and localising resource use (e.g. water, nutrients, carbon) at a productivity level consistent with balanced and efficient use of resources, accompanied by a redesign of the farming system to favour process rather than intensification. It is characterised by building natural and social capital and greater provision of ecosystem services (Tittonell *et al.*, 2020). Findings from LIFT and UNISECO suggest certain EU and national level policies and measures can facilitate agroecological transitions, but not all are effective in enabling transitions (Védrine *et al.*, 2021). A comparative analysis of 289 policy, market and mixed instruments, covering 14 types of instruments implemented at farming system, value chain and territorial levels showed CAP Pillar II has stronger links with agroecological transitions than those in Pillar I. Instruments assessed as most effective are Agro-environmental Measures; Organic Farming; Farm Modernisation and Investment; Advice, Information and Training; and, within food policies, measures that support public procurement of organic products for public canteens. CAP Pillar I is important in ensuring the viability of farming with a more ecological emphasis, linking direct payments to greening rules and cross-compliance, but with mechanisms which are insufficient to encourage agroecological transitions (Gava *et al.*, this issue; Linares Quero *et al.*, 2022).

To improve policy support that delivers environmental protection, policy should be targeted to specific practices and, or, farm typologies (Rega *et al.*, this issue). Instruments such as result-based payments and

Figure 1: Juris Maskalans, Manager of Tomini Organic Dairy Farm, Latvia, reflecting on the importance of measures in CAP Pillar II . © Baltic Environmental Forum Latvia.



eco-schemes targeting agroecological practices offer the potential to accelerate transition processes, with those planned for the CAP post-2023 providing opportunities which could be extensive in their uptake, albeit limited in site specific impacts (Gava *et al.*, this issue).

“ Une politique cohérente dans tous les secteurs et à tous les niveaux de gouvernance peut stimuler et soutenir des transitions agroécologiques qui améliorent le capital naturel, social et humain des territoires européens. ”

Achieving EU targets relating to climate change and biodiversity requires a portfolio of mutually supportive measures for managing land to deliver multiple benefits to environment and society while remaining economically viable (Gava *et al.*, this issue), changing citizen lifestyles (Costa *et al.*, 2021), and ensuring sensitivity to differences in biophysical and

socio-economic opportunities (Zawalińska *et al.*, this issue). To fulfil obligations under the EU Nitrates and Water Framework Directives more ambitious measures are needed, targeting animal production directly and facilitating legume processing at farm level (Heinrichs *et al.*, 2021).

The research shows the importance of understanding the whole agroecological farming system (Landert *et al.*, 2020). Such understanding includes implications for the environment (e.g. reducing GHG emissions), economy (e.g. added value of high quality products), society (e.g. human rights, Landert *et al.*, 2020; employment, Davidova *et al.*, this issue), and trade-offs as a consequence of changes in farming practices and systems (Albanito *et al.*, 2021). A systems level understanding will guide what to influence in order to achieve wider aims of public policy, such as a balanced approach to uptake of local produce, linked to dietary change and low carbon and plant-based foods.

Transitions towards agroecological farming practices and systems can contribute towards targets of climate neutrality in the land sector, and are key elements in public policies such as the EU [Farm-to-Fork Strategy](#). However, the potential for such transitions differs across farming systems, biophysical and

socio-cultural contexts, and dependencies between its components. Supporting instruments and measures need to be relevant to each stage in the transition (e.g. efficiency increase, energy efficiency, input substitution, system redesign), and encourage progress in the right place at the right time. Agroecological futures can be realised without compromising food security if they are embedded within wider changes in food-systems.

Otherwise, such transformations carry risks of 'exporting' environmental pressures (e.g. Mayer *et al.*, this issue). Reducing export-oriented production requires policy measures that increase levels of self-sufficiency and provision of local food, with associated shortening of supply chains, and practices that enhance soil quality and biodiversity (e.g. hedgerows, undersowing, lower grazing intensities). Actions are also required to restore soils damaged by long-term industrial agriculture resulting in poor organic matter content, the resolution of which would help to mitigate yield gaps.

Territorial challenges include producing sufficient food, with high nutritional value, and reduced dependencies on imports from places where pressures may become problematic (e.g. availability of water; social inequalities). Although reductions in demand within food systems are not prerequisites for mitigating negative environmental impacts, they can make significant contributions to achieving policy aims on climate change, biodiversity, and human health and rights when undertaken in tandem with agroecological farm practices on the supply side (Mayer *et al.*, this issue).

Developing human capital

Advice, research, innovation and training throughout social networks of farming systems are significant requirements for successful transitions to agroecology (Vanni *et al.*, 2021). The emergence and access to new technologies (e.g. drones; internet of things), and increased capabilities of farmers to



Topa ecological family farm, Romania, uses traditional practices, taking into account the history, culture and the landscape. © Cătălin Georgescu/WWF-Romania



Fritz Loidl, organic farmer since 1985, having established fruit orchards on the farm and a focus on direct marketing and, as a former Mayor, a motivator of the Kaindorf eco-region in Austria. © University of Natural Resources and Applied Life Sciences, Vienna (BOKU)

use such tools, is accelerating transition pathways, enabling managers to gain new perspectives on their land resources, and measure and monitor changes in environmental quality (e.g. soil carbon). However, their uptake can be inhibited by limitations accessing advisory services, specialised knowledge networks (e.g. Barnes *et al.*, this issue) or skilled labour (Vanni *et al.*, 2021). A strategic perspective is needed for designing, planning and implementing pipelines for the skills required for agroecological farming systems. Learning outcomes need to align with enhancing understanding of the

relevance of agroecology to tackling societal challenges. Themes relating to agroecology need to fit with aims and delivery of national level education and training policies, courses and content for primary to tertiary education, citizen-focused life-long learning, and cross traditional topic boundaries (Barnes *et al.*, this issue). Such a strategy would be consistent with aims of mainstreaming UN SDGs into education, training and learning, including sustainable use of natural resources (Council of the European Union, 2018), and European Education Area work on Education for Environmental Sustainability,

Vocational education and training and the green transition.

Stakeholder-led sharing of knowledge and innovation (thematic and place based) is effective in overcoming barriers to transitions rooted in culture, mindset, and familiarity with existing approaches and experience-based outputs. Stakeholders value messages conveyed *in situ*, by peers who have credibility through practice knowledge and evidence of delivery on-the-ground (Davidova *et al.*, this issue; Zawalińska *et al.*, this issue). Such messages should be elements of a strategy of work-based learning pathways to overcome barriers to uptake of new ideas and practices due to resistance to change, unproven approaches, or inertia in changing positions. They offer prospects of achieving acceptance of trade-offs between disbenefits over the short term to realise benefits over the longer term. For example, mitigating reduced income to farms and employees is a key requirement for transitions for re-designing agriculture in Europe (Davidova *et al.*, this issue; Albanito *et al.*, 2021).

Actors in Agricultural Knowledge and Innovation Systems (AKIS) have a pivotal role in facilitating knowledge exchange. They are knowledge champions, strengthening networks amongst relevant actors regionally, nationally and inter-regionally across Europe. However, coordination across AKIS groups is low (Gava *et al.*, this issue). Establishing regional coordination centres for AKIS actors would provide a focus for tailoring expertise to biophysical, social and economic contexts of a region. This would be consistent with the 'lighthouses' proposed in the [Horizon Mission on Soil Health and Food](#) for demonstrating solutions, training and communication of best practice and science-based evidence of management to improve soil health, informed by the [Standing Committee on Agricultural Research on Agroecology](#).

For the longer term, a strategic approach is required to training, education and life-long learning which are: i) tailored for use and accessible by all types of actors;

ii) relevant to each stage of agroecological transitions in farming systems; iii) appropriate to stage of life of individual actors; iv) contemporaneous with technical and social innovations; iv) lead to programmes of Continuing Professional Development and professionalisation of land management. This would deliver on the [European Pillar of Social Rights Action Plan](#) of at least 60 per cent of adults participating in training each year, by 2030, and [SDG 4 on inclusive and equitable quality education and life-long learning opportunities for all](#) (Schwarz *et al.*, this issue).

“ Eine kohärente Politik über Sektoren und Entscheidungsebenen hinweg kann agrarökologische Umstellungen anregen und unterstützen, die das natürliche und das Sozial- und Humankapital der europäischen Gebiete verbessern. ”

Partnerships, cooperation and social capital

To achieve the aims of policy in food and farming systems requires collaboration across geographic levels, sectors, and value chains (Gava *et al.*, this issue; Swagemakers *et al.*, 2021), including linked policies and responsibilities. Governance structures of public administrations (e.g. national, regional, local authorities, public agencies) are key frameworks for delivering public policy. Combined they have responsibilities for regulatory control (e.g. standards of food, water and air quality, animal welfare, health and safety), aspects of funding (e.g. design Rural Development Programmes, national CAP strategies), advice (e.g.

information campaigns) and decision-making (e.g. planning certain types of land uses). However, components are distributed across agencies and departments, creating complexities in responsibilities and frameworks and so barriers to agroecological transitions (Gava *et al.*, this issue). Such barriers can be overcome by refining structures of public governance to align with contemporary aims, and disconnect from historical framing (e.g. production sectors).

Driving transitions to agroecological farming, as per the EU Farm-to-Fork Strategy, requires greater cooperation within supply and value chains, supporting local processing, and enhancing producer-consumer linkages (Gava *et al.*, this issue). Findings show the importance of deepening and broadening social capital within rural areas, across and within farming systems, and each type of actor within food systems (e.g. AKIS; Schwarz *et al.*, this issue; Zawalińska *et al.*, this issue). Strengthening social capital around shared values can be realised through effective collaborative actions (e.g. peer-to-peer learning; machinery rings), within and across geographic levels (e.g. field up to region), and land management sectors (e.g. arable cropping, livestock types, forestry). Within value chains, improved social capital can be effective in collective negotiating with major retailers in securing higher prices that encourage agroecological production. Negotiations with the public sector can lead to its procurement processes encouraging products with low carbon and environmental impacts (Figure 2) (Schwarz *et al.*, this issue).

Collaborative approaches to policy design can contribute to overcoming cognitive barriers to the adoption of agroecological practices by farmers and new approaches to the food system (as proposed in the '[Partnership on Accelerating farming systems transition: agroecology living labs and research infrastructures](#)', European Commission, 2022). They have the potential to improve the results of agri-environmental schemes by increasing the adoption of practices, fostering environmental synergies and, in turn, strengthening

community and family networks (Sachet *et al.*, 2021). However, they can create barriers and discourage participation, leading to trade-offs that must be addressed in policy design (Legras *et al.*, 2021).

Payment for Ecosystem Services (PES), implemented through the CAP, is one potentially effective means of increasing the adoption of agroecological practices by farmers. Spatial targeting of the beneficiaries and monitoring systems (i.e. by whom and how often it is performed) are the attributes of PES design that are the most conducive to achieving significant environmental impacts (Védrine *et al.*, 2021).

There is a need for partnerships of public, private, research and civil society sectors at levels of governance relevant to locally significant systems of farming or land use. Such partnerships should be formally constituted, aiming to accelerate uptake and implementation of agroecological practices through the progressive changing of mindsets and attitudes of actors throughout the farming system towards their role in tackling societal challenges (e.g. climate change, biodiversity loss, social rights) (e.g. Barnes *et al.*, this issue; Schwarz *et al.*, this issue). Such forums can provide insights into cultures, power relationships and local practices that need to change, creating operational, instrumental, capacity building and networking impacts (Zawalińska *et al.*, this issue). They can be key focal points to motivate and empower actors to develop shared visions for local areas, such as contributing to the proposed [LTVRA Rural Action Plan Revitalisation Platforms](#).

Findings showed a need for greater understanding of the significance of every component of systems of farming. Public policy should incentivise actors throughout the supply chains to recognise shared responsibilities for tackling climate change, reversing loss of biodiversity, and rebalancing social inequalities. Eligibility for grant support should be linked to the actions taken by businesses under their Environment, Social and

Figure 2: Marijo Imaz, Urduna City Council, Spain, noting that some municipalities are including local organic products in their public canteens
© Sigi-Saga Ekoizpenak Kooperatiba.



Cereal-protein mix in an arable farm © INRAE Aster Mirecourt

Governance (ESG) commitments. Such commitments would be towards the inclusion of women and vulnerable groups in planning changes in business operations, which would also be in line with the EU Fit for 55 package and [LTVRA Flagship of Increasing environmental, climatic and social resilience](#).

Access to data and tools

Agroecological practices and systems can contribute to, and benefit from, operationalising [Open Science](#) approaches to collecting environmental data, and thus the [EU](#)

[Open Science Policy](#). Such contributions are consistent with developing shared visions, recognition of responsibilities, FAIR principles (Findable, Accessible, Interoperable and Re-usable data) and commitments of EU and Member States to the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. This should be accompanied by means of tracking impacts in relation to targets (e.g. reducing GHG emissions, biodiversity, social rights) using effective means of measurement and monitoring of progress made on transitions.

To benefit from *ex-post* policy evaluation to inform future policy design, data requirements should be identified during its early stages or implementation, in particular ecological and social information at the farm level. Dialogue between researchers and policymakers early in the process is required to identify what data are required, how they are collected, and what and how they are made available.

The new tools, data, and dashboards (e.g. Copernicus, [LTVRA Rural Action Plan Rural Observatory](#)) offer good prospects for enhancing collaboration (within communities of place; between citizens, civil society, businesses, policy and research), and fostering innovation and transformative visions (social and technical innovation). One key tool for monitoring transitions is the Farm Accountancy Data Network (FADN), transformation of which into the Farm Sustainability Data Network (FSDN) should contribute to the information base for developing policies to aid transitions towards agroecological practices and systems (Niedermayr *et al.*, this issue). However, information needs to be up-to-date, quality controlled, and tailored to local contexts of governance (e.g. to relevant strategies such as national CAP strategies), and usable by local actors.

Conclusions

The overall aim of transitioning to agroecological farming practices and systems is providing food, sustainable management of the environment, and protecting social rights in line with international, EU and national commitments. This aim can be aided by actions of the public sector through its influence on directing funds, such as through procurement. Not all policy objectives can be achieved simultaneously or without trade-offs. Current policy frameworks, at different levels of governance, have mixed effectiveness in delivery, and weak connectivity between levels and across sectors. Coherence is needed between policies that mutually reinforces their aims, as noted by the HLPE (2019). Policy measures should extend the



Dairy cows exclusively fed on grass (pasture and hay) © INRAE Aster Mirecourt

definition of the [European Pillar of Social Rights](#) No. 20 on access of essential services; to include access to an affordable, nutritious diet, in sufficient quantities, as a human right alongside rights to public goods of good quality water and air (as per [UN Sustainable Development Goals](#) and aims of the [European Green Deal](#)).

“ Coherent policy across sectors and governance levels can stimulate and support agroecological transitions that enhance the natural, social and human capital of European territories. ”

Core elements of transitions should include strategies for developing human and social capital, embedding agroecological principles within programmes to develop capabilities and skills of younger generations of current and future land managers. Successful transitions would also deliver on the [Next Generation European Union](#) of

‘advancing climate action and promoting environmental and biodiversity protection’ and a ‘greener, more digital, more resilient and better fit for the current and forthcoming challenges’.

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Summary


Creating Conditions for Harnessing the Potential of Transitions to Agroecology in Europe and Requirements for Policy

 Food systems require reorientation to take greater account of interactions with the environment, economy, health and society. Transitions to agroecological farming practices and systems can connect policy areas and realise environmental, economic and social aims. These transitions provide a lens for reviewing policy, practice and behaviours of actors in farming systems and value chains, identification of barriers to uptake, and policy areas to which they contribute or where there are gaps. Developing social and human capital, and governance structures that enable transitions to agroecology are key to their prospects of success. Education and life-long learning are key to developing the knowledge and skills of younger generations of land managers and other actors in value chains, throughout their careers. The outcome sought is for a shared understanding of the benefits of agroecological practices and systems, creating opportunities to rebalance policies towards delivering climate neutrality, reversing biodiversity loss, and enhancing rights of citizens. To realise those opportunities policies and strategies should be coherent across territorial and systems levels, and tailored to place, system, people, and stages of transitions. Overall, they should be designed to ensure all citizens are beneficiaries of transitions to agroecological farming systems, over the long term, and that no-one or place is disadvantaged by the processes of change or the outcome intended.

Création de conditions pour exploiter le potentiel des transitions vers l'agroécologie en Europe et exigences des politiques

 Les systèmes alimentaires doivent être réorientés pour mieux prendre en compte les interactions avec l'environnement, l'économie, la santé et la société. Les transitions vers des pratiques et des systèmes agricoles agroécologiques peuvent relier les domaines de l'action publique et permettre d'atteindre des objectifs environnementaux, économiques et sociaux. Ces transitions fournissent une perspective pour examiner les politiques, les pratiques et les comportements des acteurs des systèmes agricoles et des chaînes de valeur, l'identification des obstacles à l'adoption et les domaines d'action publique auxquels ils contribuent ou qui présentent des lacunes. Le développement du capital social et humain et de structures de gouvernance qui permettent les transitions vers l'agroécologie est la clé de leurs chances de succès. L'éducation et l'apprentissage tout au long de la carrière sont essentiels pour développer les connaissances et les compétences des jeunes générations de gestionnaires fonciers et d'autres acteurs des chaînes de valeur, tout au long de leur carrière. Le résultat recherché est une compréhension partagée des avantages des pratiques et des systèmes agroécologiques, créant des opportunités pour rééquilibrer les politiques vers la neutralité climatique, inverser la perte de biodiversité et renforcer les droits des citoyens. Pour concrétiser ces opportunités, les politiques et stratégies doivent être cohérentes à tous les niveaux territoriaux et systémiques, et adaptées au lieu, au système, aux personnes et aux étapes des transitions. Dans l'ensemble, elles devraient être conçues pour garantir que tous les citoyens bénéficient des transitions vers des systèmes agricoles agroécologiques, sur le long terme, et que personne ni aucun lieu ne soit désavantagé par les processus de changement ou les résultats escomptés.

Schaffung von Bedingungen für die Nutzung des agrarökologischen Potenzials in Europa und Anforderungen an die Politik

 Die Lebensmittelsysteme müssen neu ausgerichtet werden, um den Wechselwirkungen zwischen der Umwelt, der Wirtschaft, der Gesundheit und der Gesellschaft stärker Rechnung zu tragen. Die Umstellung auf agrarökologische Anbaumethoden und -systeme kann die Politikbereiche miteinander verbinden und zur Erreichung ökologischer, wirtschaftlicher und sozialer Ziele beitragen. Sie bieten einen Ansatzpunkt für die Überprüfung der Politik, der Praxis und der Verhaltensweisen der Akteure in landwirtschaftlichen Systemen und Wertschöpfungsketten. Des Weiteren helfen sie bei der Ermittlung von Umsetzungsbarrieren und von Politikbereichen, zu denen sie beitragen oder in denen es Lücken gibt. Die Entwicklung von Sozial- und Humankapital sowie von Governance-Strukturen – die den Übergang zur Agrarökologie ermöglichen – sind ein wesentlicher Erfolgsfaktor. Bildung und lebenslanges Lernen sind ein zentraler Baustein, um die Kenntnisse und Fähigkeiten der jüngeren Generationen von Landwirten und Landwirtinnen und anderen Akteuren in den Wertschöpfungsketten zu entwickeln. Das angestrebte Ergebnis ist ein gemeinsames Verständnis über die Vorteile agrarökologischer Praktiken und Systeme. Dieses schafft Möglichkeiten für eine Neuausrichtung der Politik im Hinblick auf Klimaneutralität, Umkehrung des Verlusts der biologischen Vielfalt und Stärkung der Rechte der Bürger. Zur Verwirklichung der Möglichkeiten, sollten Politiken und Strategien über territoriale und Systemebenen hinweg kohärent und auf Ort, System, Menschen und Phasen des Übergangs zugeschnitten sein. Insgesamt sollten sie so konzipiert sein, dass alle Bürgerinnen und Bürger langfristig von der Umstellung auf agrarökologische Bewirtschaftungssysteme profitieren und dass niemand oder kein Ort durch den Veränderungsprozess oder das angestrebte Ergebnis benachteiligt wird.

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