



SOLINSA
Support of Learning and Innovation
Networks for Sustainable Agriculture

Agricultural Knowledge Systems In Transition:
Towards a more effective and efficient support of Learning
and Innovation Networks for Sustainable Agriculture

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FINAL REPORT OF THE SOLINSA PROJECT

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EXECUTIVE SUMMARY

The Final Report outlines results of the project “Agricultural Knowledge Systems in Transition: Towards a more effective and efficient support of Learning and Innovation Networks for Sustainable Agriculture” (Project acronym: SOLINSA).

The project was conceived and implemented as a response to the need for identifying new ways of transition from “*productivist*” practices to more sustainable agriculture and rural development, where traditional institutions in charge of fostering innovation are not always relevant and effective.

The EU SOLINSA project proposes a new organisational pattern aimed at fostering innovation for transition. It illuminates the role of learning and innovation in transition processes, explores networks as drivers of innovation and proposes the concept of Learning and Innovation Networks for Sustainable Agriculture (LINSA) as policy device to help farmers and rural actors generate innovations for transition.

The consortium was comprised by 11 research institutions from 8 European countries. To achieve the project objective of identifying effective and efficient approaches for the support of successful LINSA, researchers collaborated with 17 LINSA using a transdisciplinary method based on participation.

This report is a summary of the most relevant empirical results and theoretical advancements achieved in the project.

LINSA as a special type of network

The first section of the report presents the concept of LINSA, its specific traits of LINSA, and the role in transition towards more sustainable agriculture and rural development. LINSA are defined as networks of producers, consumers, experts, NGOs, SMEs, local administrations as well as official researchers and extensionists, that are mutually engaged with common goals for sustainable agriculture and rural development - cooperating, sharing resources and co-producing new knowledge by creating conditions for communication (Brunori et al. 2013).

For qualifying as LINSA networks need to show the following six features:

- a dynamic balance of diversity and commonality;
- a shared goal of innovation;
- mutual engagement (participation, commitment(although not all actors participate to equal extent);
- a minimum level of governance and organization of network;
- reflexivity: network participants have to steward learning activities, reassess innovation objectives and evaluate sustainability performance;
- innovation and sustainability are to be connected and embodied in LINSA activities and practices of their members.

Theoretical framework and theoretical advancements

The second section of the report presents key theoretical advancements in learning and innovation in the context of transition towards sustainable agriculture. The project used several reference theories as the starting point (actor-network theory, social learning and communities of practice, innovation systems, socio-technical transition) and applied them to exploration both of LINSAs and AKS institutions. As the result, SOLINSA researchers were able to propose theoretical advancements both in developing the LINSAs concept, models of LINSAs interaction with AKS, characteristics of learning and innovation processes in LINSAs, the range of sustainability discourses used by LINSAs, the links between learning, innovation and sustainability in LINSAs.

A key theoretical advancement is the development of the analytical tools of boundary work and boundary objects for analysis of social learning in sustainable agriculture networks. In LINSAs learning, boundaries have to be negotiated between various knowledge bases, attitudes and learning forms. Boundary work and boundary objects evolve as networks develop. Boundary work and boundary objects are instrumental in consolidating innovation. They help internal integration in the LINSAs, the mobilisation of external supporters and the adjustment of network goals. Boundary work also is used to accommodate different attitudes towards sustainability.

Challenges in supporting LINSAs

We discuss three challenges in supporting LINSAs: how to support learning and innovation in network; how to support LINSAs as drivers for bottom-up innovation; what the specificities of research to support LINSAs are. We conclude that perspectives need to change in order to effectively support LINSAs, which can then act as drivers for change of AKS.

From these challenges, recommendations are developed for AKS actors, and policy.

Recommendations for AKS actors

Education and Training

LINSAs should be included in teaching at agricultural colleges, and it is necessary to acknowledge that traditional teacher-led training will not always be appropriate. Soft skills need to be trained to provide actors engaged with LINSAs with the necessary competences.

Advisory services and Extension

With regard to advisory services and extension, we advise to create opportunities for fostering knowledge co-creation, recognition and promotion of spaces for interaction of varied types of knowledge, acknowledgment of diverse knowledge needs of learning and innovation networks, and responding to the new realities in an interactive, participatory, needs-based ways that respect the ethos of LINSAs.

Research

Participatory research can assist LINSAs in developing their potential, but this needs to be a thoughtful approach and include a phase of carefully approaching the networks before effectively working with them. Participatory research requires particular skills of researchers, and these have to be learned and practiced. Research policy can enhance such approaches.

Recommendations for policy actors

This section presents the results of WP3 and WP7 and describes how LINSAs can be supported by European innovation policies, such as the EIP on Agricultural Productivity and Sustainability, the European Agricultural Fund for Rural Development (see Annex 1), and Horizon 2020.

Supporting social learning in innovation networks

The comparative analysis showed a great diversity among the organisation of AKS (see Annex 2). Traditionally organised AKS typically has difficulty in dealing with the generation and acceptance of radical new ideas. More pluralistic AKS (e.g. a diverse privatised advisory and extension service) on the other hand, have problems in coordinating innovations for long-term environmental issues and other typical public goods.

A basic conclusion from analysing the LINSAs is that effective support needs to incorporate a strong focus on process, thus going beyond technical/content support. Measures are listed that go in this direction (Table 2).

Supporting LINSAs to foster institutional innovation

LINSAs develop innovations without being constrained by hierarchies and agendas existing within traditional AKS. Being placed at the margins of traditional AKS, they enjoy more freedom of movement. The AKS can learn from successful LINSAs and embody achievements into their routines. This implies that LINSAs can be seen as drivers of institutional change, if the link between LINSAs and AKS is appropriately managed. We list possible support measures aimed at improving the interaction between LINSAs and AKS (Table 3).

Support cooperation and mutual learning of LINSAs and AKS

Efficient and effective co-operation between AKS and LINSAs can be supported by specific projects, including facilitation of the animation of bottom-up initiatives; facilitation of partnerships of learning; documentation of processes of learning and innovation.

Transition Partners

Supporting a process of social learning leading to transition towards a more sustainable agriculture brought us to introducing a new concept of AKS actors: transition partners. They support social learning and the related group dynamic processes especially through a methodological approach, and can fulfil different roles and functions: facilitators, participatory researchers, boundary persons, experts, intermediary persons, or innovation broker as referred to by the EIP.

Five take-home messages from SOLINSA

From the three-year-long engagement in collaboration and research with LINSA, we have distilled five main insights that may inspire and inform future research in this field:

1. LINSA are networks of producers, consumers, experts, NGOs, SMEs, local administrations as well as official researchers and extensionists, that are engaged in sustainable agriculture and rural development - cooperating, sharing resources and co-producing new knowledge by creating conditions for communication.
2. There are different forms of LINSA. LINSA can have a strong relationship with the AKS or not be connected to the AKS at all, or a relationship that lies between these extremes.
3. There is a need for opening spaces and creating an environment in which LINSA can develop their full potential to contribute to innovation for sustainable agriculture – beyond traditional AKS.
4. The role of AKS as partners for LINSA needs to be strengthened.
5. In this situation, transition partners emerge as new kind of actors, with particular roles and functions. These are various kinds of networkers, facilitators, participatory researchers, boundary persons, or experts who engage with LINSA in joint learning and innovation for sustainability.

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1 INTRODUCTION

There is a growing recognition that the technological and organizational solutions the agricultural sector has undertaken in the past are not always compatible with the constraints and opportunities faced by rural economy and society (Brunori et al. 2013). This has generated an increased emphasis on transition to new business, technological and policy models. Innovation is a key to transition, but the institutions that are charged with fostering innovation are often locked into old approaches and methods of intervention. The EU SOLINSA project proposes a new organisational pattern aimed at fostering innovation for transition. In this regard, it illustrates the role of learning and innovation in transition processes, discusses the role of networks as drivers of innovation and proposes the concept of Learning and Innovation Networks for Sustainable Agriculture (LINSA) as policy device to help farmers and rural actors generate innovations for transition.

1.1 SOLINSA research

The Final Report outlines results of the project “Agricultural Knowledge Systems in Transition: Towards a more effective and efficient support of Learning and Innovation Networks for Sustainable Agriculture” (Project acronym: SOLINSA)¹.

The overall objective of SOLINSA was to identify effective and efficient approaches for the support of successful LINSA (Learning and Innovation Networks for Sustainable Agriculture) as drivers of transition towards Agricultural Innovation Systems for sustainable agriculture and rural development. Specifically, the project explored LINSA and how policy instruments, financial arrangements, research, education and advisory services might support LINSAs in cost-efficient and effective ways. The consortium was comprised by 11 research institutions from 8 European countries.

To achieve the project objective, researchers collaborated with 17 LINSA networks across Europe using a transdisciplinary method based on participation. These interactions unfolded as a joint learning process, where researchers strived also to be partners for LINSA in addressing actual/topical development issues. Interactions with each of the LINSA resulted in an analysis of 8 characteristics per LINSA (Degree of Integration; Level of Innovation; Scale; Origin and Function; Links between AKIS and LINSA; Level of Learning; Governance; Efficiency and Effectiveness of Support), to examine their potential as bottom-up drivers of transition. To enrich analysis, 8 supplementary cases were analyzed.

¹ SOLINSA was funded by the Seventh Framework Programme of the European Commission. It started in February 2011 and finished in January 2014.

The project partners successfully achieved the project's specific objectives, namely,

- Developed and improved a conceptual framework for innovation for sustainable agriculture and rural development (WP2 and WP8)
- Identified institutional determinants that enable or constrain existing AKS in supporting effective LINSAs in the context of changing knowledge and innovation policies (WP3)
- Explored LINSAs empirically (WP4)
- Improved understanding of barriers to complex learning processes and developing recommendations on how to avoid / remove them (WP5)
- Created open learning spaces for actors outside the project by sharing and disseminating project findings (WP6)
- Developed operational tools for relevant actors to support successful LINSAs in terms of effective and efficient policy instruments, financial arrangements and a better coordinated approach of different policies (WP7)

This Final Report presents the summary of the project's results, structured as follows: Chapter 2 presents the LINSAs concept and discusses the conceptual framework, revised and further developed in the light of empirical data of the project; Chapter 3 outlines recommendations for supporting LINSAs, for AKS actors, policy actors and transition partners, and in Chapter 4 we conclude with five lessons learned for advancing learning and innovation for the transition towards sustainable agriculture and rural development.

1.2 Innovation as a driver of transition

The notion of transition describes a process of changing techno-economic regimes and frames of reference, which affects multiple levels of the economy from individuals to economic systems (Geels 2004). Transitions occur when new techno-economic principles become a coherent whole and replace the old ones.

The SOLINSA project has applied the transition approach to agriculture and rural development (Brunori et al. 2011) looking at the role of learning and innovation networks. In agriculture transition applies to a shift from the 'productivist regime', characterised by production growth, high yields and input intensification, to a regime built around the principles of sustainable production. The transition to productivism was largely a top-down state-driven process, based on the principle that the 'right knowledge', produced by official research centres, should be transferred to producers through official extension services. The functional division between research, education and extension was underpinned by this principle. In fact, there is a growing evidence of bottom-up initiatives developing the capacity to mobilise social energies for change by creating space for experimentation and turning local values into development resources. This enhanced capacity allows these initiatives to put pressure on the critical points of resistance within the current regime. These initiatives often develop outside or at the margins of official research and extension bodies.

1.3 Networks as drivers of innovation for transition

Following recent concepts of innovation as a systemic activity (e.g. Knickel et al. 2009, Klerkx et al. 2012a) SOLINSA research uses a network approach in addressing the issue of learning and innovation, which allows acknowledgement and integration of various knowledge sources, types and processes and learning modes. Thus, we shift from monoculture of scientific knowledge towards ecology of knowledge, which assumes the diversity of knowledge and its composite character (Santos et al. 2007). The network model allows introducing into the agricultural knowledge system a whole range of agents: not only farmers, but also consumers, rural residents, market enterprises, NGOs, policy makers and other actors who also make their diverse knowledge inputs to agricultural development (Knickel et al. 2008, Oreszczyn et al. 2010, Leeuwis and Aarts 2011). All together they represent a great diversity of available knowledge resources which are used in agricultural and rural development practices: technical and economic, production and marketing oriented, codified and tacit, local and distant, farmers and expert created, issue specific and more generic, necessary for the solution of specific problems and systemic transformation, etc. Networks are not static but evolving: they may grow over time and depending on the radicality of the innovations they propose they may alter existing configurations of actors in current production systems and value chains (Knickel et al. 2009).

A network consists of individuals and organizations and the relations between them (Wasserman and Faust 1994) and can be seen as a relational pattern through which flows of material and immaterial resources occur and innovations happen (Brunori et al. 2013). The network concept challenges the way that research and extension have been conceived in support of productivism. Within networks expertise is recognised through reputation and trust, not only as an attribute belonging to specialised bodies. Networks blur distinctions between defined categories of producers, researchers, educators and extension advisors. Contrary to prevailing research and extension approaches, a network involves a variety of different knowledge sources, and legitimation of them is linked to the performance of practices they generate.

The network model revises also the examination of the learning process, that is, what is learning and how new knowledge is gained. Instead of the linear knowledge transfer model which considers individual farmers as learners who are presented as passive absorbers of the purposefully disseminated knowledge, the network model rather advocates active social learning (Wenger 2000, Leeuwis and Aarts 2011) that happens in interaction among many different network members.

1.4 Overview of LINSAs

The EU research project SOLINSA studied a number of such networks operating in various fields of sustainable agriculture and rural development. The aim of the project was to study learning and innovation processes and identify characteristics that make (or do not make) these networks drivers of transition.

The project's definition is that LINSAs are networks of producers, consumers, experts, NGOs, SMEs, local administrations as well as official researchers and extensionists, that are mutually engaged with common goals for sustainable agriculture and rural development - cooperating, sharing resources and co-producing new knowledge by creating conditions for communication (Brunori et al. 2013).

Table 1: The variety of LINSAs analysed

LINSA	Components	Size	Field	Focus & level of innovation
E B&H , <i>Brighton and Hove Food Partnership, England</i>	NGOs, public organisations, entrepreneurs	Over 200 organisations in the state, private and voluntary sectors	All stages of the food chain	Patterns of food consumption and production in a large urban area. Radical.
E Perm , <i>Permaculture Community (Permaculture Association and the Land Project), England</i>	Permaculture practitioners, researchers, Permaculture Association	40 demo sites	Permaculture design	Creating sustainable human environments. Radical.
EU Organ , <i>The European Organic Data network</i>	Researchers, market data collectors	Not defined	Organic farming data collection	Standardise methods of data collection, enable access to data.
F RAD , <i>Réseau Agriculture Durable– Network for a Sustainable Agriculture, France</i>	Farmers, advisors, researchers	29 local groups, 2000 farms	Sustainability of livestock farming practices	Soil protection, low input farming systems, direct marketing. Radical.
F Charter , <i>Charter of Good Agricultural Practices in Livestock production, France</i>	Farmers, technicians - facilitators, researchers, consumers	About 100 000 farmers, 2500 facilitators	Cattle farming	Ensure quality and sustainability of cattle farming practices. Incremental.
G Women , <i>Bavarian Rural Women's Association, Germany</i>	Women farmers, facilitators	6, 600 local groups	Promoting women's interests in agriculture policy and practice	Improvements in rural devt from women's perspectives. Incremental.
G DLG , <i>German agricultural society (Deutsche Landwirtschaftsgesellschaft), Germany</i>	Farmers, researchers, facilitators, policy-makers, industry	Over 23 000 members	Innovation in agriculture, broadly	Exchange of know-how, dissemination. Incremental.
H G7 , <i>Local Food Council of Gödöllő, Hungary</i>	NGOs, researchers, authorities, entrepreneurs	About 30 members	Sustainable urban food	Innovation for sustainable urban food strategies. Incremental.

H Nat , <i>The NATURAMA Alliance, Hungary</i>	Farmers, facilitators, researchers	11 LEADER local groups	Rural and community development	Improve rural development practices. Incremental.
I CVR , <i>Consorzio Vacche Rosse, Italy</i>	Farmers in a consortium	A narrow group	Biodiversity in cattle breeding	Valorisation of traditional dairy cattle breed. Retro-innovation, incremental.
I Crisop , <i>Association for Solidary Economy I Crisperla, Italy</i>	Organic farmers, agronomists, consumers' associations, small food artisans	About 30 members	Local organic farming and food provision	Reorganisation of local organic food system. Radical.
N Care , <i>Cooperative Boeren Zorg: Care Farmers in the Netherlands</i>	Care farmers, researchers, public authorities in health care and agriculture	65 farmers	Intersection of health care and agriculture	Alternative vision of health care and farming. Initially radical.
N Dairy , <i>Sustainable Dairy Farming, Netherlands</i>	Farmers, researchers, advisors	About 100 farmers	Dairy farming nutrient system	Low external input farming. Incremental.
S ACDF , <i>Association for the development of fodder production, Switzerland</i>	Farmers, researchers, extension services	1000 farmers, 40 AKS, 14 technical experts	Pasture management, biodiversity.	Conservation of natural resources. Incremental.
S Naturli , <i>Naturli Co-operative Cheese production, Switzerland</i>	Public authorities, farmers, SMEs, small retailers	150 farmers, 27 small dairies	Logistics for organic milk cheese production and marketing	New technologies, business model, and knowledge. Initially radical.
L Biogas , <i>the Latvia Biogas Network</i>	Biogas producers, researchers, public authorities, investors	About 90 members	Renewable energy production	Localization of borrowed technologies, economic and environmental goals. Radical.
L Fruit , <i>Latvian Fruit-growing Network</i>	Farmers, researchers, extensionists, retailers, NGOs.	About 400 members	Fruit-growing	Promote integrated fruit growing. Incremental, retro-innovation

The SOLINSA study identified different network typologies: from local scale to national or transnational; from small, simple homogenous networks to large, complex and diverse networks with multiple actors; from incremental to radical innovation; from top-down to bottom-up origin; and with action fields including non-food oriented, such as biogas production, food production oriented, such as dairy production, and consumer oriented, such as urban food networks (Ingram et al., 2013).

Different kinds of networks were identified: with a high degree of formality (G DLG); with a high degree homogeneity (G Women); a loose network (N Dairy); a 'network of networks' (E B&H). Participation of diverse agents is advantageous for diverse forms of learning and knowledge flows, leading to innovations. When LINSAs include people from the official research and extension bodies, these learning processes can also generate dynamics within these respective organisations making them more amenable to reform.

The study shows that LINSAs may emerge from small groups of farmers (F RAD) or may be inspired by individuals (S Naturli, F RAD); can emerge as a formalisation of an existing diffuse network (E Perm); or grow by progressive process of co-opting local groups (F RAD). The structuring of the network often goes through a formalisation process (I Crisop). Policy developments (favourable opportunities to develop certain activities) and public attention to an issue (e.g. food quality concerns) might stimulate emergence of LINSAs. However, not all LINSAs are keen to grow and become mainstream. Networks may be also quite vulnerable to external forces (new policies, economic challenges, etc.) over the course of their development. Over time networks tend to formalise – develop rules, roles, procedures.

The SOLINSA study provides some answers to the question of preconditions for a network to become a LINSAs. There have to be the following features:

1. an integration between diversity and commonality;
2. a shared goal of innovation;
3. mutual engagement (participation, commitment), although not all actors participate at equal extent;
4. a minimum level of governance and organization;
5. reflexivity – network participants have to steward learning activities, reassess innovation objectives and evaluate sustainability performance;
6. innovation and sustainability are to be connected and embodied in LINSAs activities and practices of their members.

2 THE REVISED CONCEPTUAL FRAMEWORK AND THEORETICAL ADVANCEMENT

The initial conceptual framework (Brunori et al. 2011) was based on several key ideas: a general understanding of innovation in agriculture as a socio-technical system, a non-linear approach to innovation, the concept of networked innovations that involve complex range of participants and knowledges. One of the key ideas was that development of innovation involves reframing and learning underlies all innovation.

These ideas are based in reference theories such actor network theory, socio-technical transition theory, innovation systems theories and social learning theories. The main concepts which constituted the initial theoretical framework and were elaborated in analytical framework and afterwards tested in empirical LINSAs studies were the concepts of: innovation, learning, sustainability, networks, knowledge, AKS, organisational forms of learning (communities of practice, networks of practice), boundary work, boundary organisations, innovation brokers. The last notion during SOLINSA research was developed into a new and more embracing and participatory concept of transition partners.

SOLINSA research advanced some of these concepts with grounded evidences from collaborative action research with 17 LINSAs. The main conceptual advancements can be grouped in four streams: uncovering LINSAs as specific kind of network and their relationship with AKS; characterising learning, innovation and sustainability processes and outcomes in LINSAs and links between these processes (L-I-N-S); deepening the understanding of the role of boundary work and boundary objects as tools to analyse and promote innovation in networks; describing LINSAs as agents of socio-technical change towards sustainability. These advancements are briefly characterised in the following sections. For a more in-depth discussion, see *The Report on the Revised Theoretical Framework (D8.1)* at www.solinsa.org.

2.1 LINSAs as a special type of network in sustainable agriculture

SOLINSA research gave evidence of diversity and complexity of LINSAs, built typologies and set criteria for networks to classify as LINSAs. LINSAs allow social innovation through different types of network. They can develop as communities of practice (CoP), networks of practice (NoP), constellations of practice or webs of actors. They can fall within or outside of the conventional AKS and can be incremental or radical innovators.

LINSAs embrace producers, consumers, experts, NGOs, SMEs, local administrations and components of the formal AKS that are mutually engaged with common goals for sustainable agriculture and rural development - cooperating, sharing resources and co-producing new knowledge by creating conditions for communication.

LINSAs are diverse and complex in form and structure and, in the empirical

study, were grouped into those that are consumer, non-food or agriculturally oriented networks. They vary in their degree of formality, modes of learning, size and degrees of consensus. They can overlap. They tend to have ‘flat’ and egalitarian organisational structures.

LINSA have various development trajectories – they grow for knowledge, economic and accreditation reasons. As they grow they tend to formalise but not all LINSA wish to become mainstream. Over time networks tend to formalise – develop rules, roles, procedures. Formalisation, improved organisational structures and professionalisation develop as a response to economic incentives, organisational failures and the desire for credibility. The stages of growth may follow the economic and market development, political opportunities, funding opportunities, or societal demands.

LINSA can have a strong relationship with the AKS or none at all, or a relationship that lies between these extremes. Ways of working between LINSA and AKS depend on openness of AKS institutes towards novelties and reviewing AKS own working methods is a precondition for its effective cooperation with LINSA.

LINSA require some commonality of view, shared innovation goals, the commitment of members, some level of governance and an embodied connection between innovation and sustainability.

2.2 Learning, innovation and sustainability in LINSA

Theoretically, learning can be addressed through the actor-network approach (e.g. Latour 1984; Callon 1986) which is valuable for understanding how learning is negotiated between different actors. Learning also can be addressed through social learning theories and communities of practice, within which boundary objects can be explored. Individual, social and organisational processes of learning can be explored through these conceptual frameworks. Innovation can be radical or incremental, top-down or bottom up.

Learning is important, but its focus varies between LINSA and needs change as the LINSA develops. Forms of learning between LINSA are different and change over time. Individual learning predominates in most LINSA. Social learning is interactive, experiential, peer to peer, and varies in formality. Organisational learning commonly involves outside organisations. There can be several of these forms of learning within any one LINSA.

Learning becomes more diverse, the more diverse the constituency of the LINSA. Diversity (and complexity) must be balanced with commonality otherwise the LINSA might become unstable. Co-ordination can help this balance but LINSA have been observed to be uncoordinated, have limited co-ordination or be fully co-ordinated. As LINSA become more formalised, learning tends to be more co-ordinated. Co-ordination can address how inclusive or exclusive learning is. Internet learning is seen as inclusive.

Learning in a network means balancing a tension between the degrees of closeness/openness, inside/outside, formality and informality. It impacts the range and outcomes of learning. SOLINSA found a number of linkages between learning, innovation and various LINSA characteristics. Learning is seen as a

priority for most LINSAs but the focus of learning varies. As networks develop, learning needs change. Organization of learning tends to follow three degrees of coordination. Different mechanisms of learning co-exist in LINSAs.

Research demonstrated that participation of diverse agents is advantageous for diverse forms of learning and knowledge flows, leading to innovations. Importantly, the study showed that knowledge as a shared resource is indeed present in LINSAs, which confirms the potential of LINSAs to integrate various knowledges and use them in a shared way, e.g. to innovate. After the initial success of innovation, continuing to innovate is an issue of the balance between the economic goals and new knowledge development goals, promoted by certain groups of actors.

Innovation paths in a LINSAs are influenced by its origin or starting point. Innovation is most likely to be successful when bottom up and top down drivers are convergent and where networks are integrated. Open networks can be more innovative than closed ones and a diversity of stakeholders in a network can stimulate innovation. These latter two factors can stimulate radical innovation. Radical and incremental innovation may be at different points on the same innovation path as innovation changes over time. As LINSAs develop and become more formalised their ability to disseminate innovation improves.

Sustainability as a concept is considered to be reflexive, inclusive and context dependent with different interpretations in different LINSAs. Most however embrace social, economic, technical, multifunctional and environmental factors in a combination of ways. Sustainability goals can be either implicit or explicit.

SOLINSA case studies show that agricultural sustainability, the intended overarching goal of transitions driven by LINSAs, contains quite differing meanings for the involved actors. SOLINSA cases have been helpful to better understand how those meanings have evolved in specific local contexts and individual situations. SOLINSA researchers identified six different types of discourse on sustainability in the 17 LINSAs: Alternative Advocates, Sustainable Food Production, Autonomous Rural Development, Latvian Fruit, Care Farmers, Farmer Survival First (Hermans et al. 2013). Sustainability idea may be either explicit or implicit.

Sustainability meanings are often negotiated (and renegotiated over time) in the context of innovation, learning (and relearning) and the interpretation of knowledge, in an iterative way. Learning is felt to be the most important element of these relationships, but it does not axiomatically lead to improved sustainability behaviour.

2.3 Boundary objects and boundary work as analytical tools for examining learning and innovation processes in LINSAs

This sub-section is an extended abstract of Tisenkopfs et al (2015 forthcoming) – a paper submitted as part of a special issue on SOLINSA in the Journal of Agricultural Education and Extension.

It has become acknowledged that building and managing learning and

innovation networks requires boundary work (Klerkx, Hall and Leeuwis 2009, Clark et al. 2011, Klerkx and Gildemacher 2012; Mollinga 2010). SOLINSA research deepened understanding of how boundary work happens in LINSAs what boundary objects are used and what are the outcomes.

Boundary objects are organising elements of social learning. They can be artefacts, discourses or processes and are created as part of the learning and innovation process. A variety of boundary objects are negotiated and used by LINSAs in working towards improvements in three desired areas learning, innovation and sustainability. The research demonstrates that these are physically and conceptually varied objects (policy document, a specific technology, a specific method, a set of practices, a specific product, a specific interpretation of a publicly relevant concept), they are also different in being general or specific. This trait is related to the stage of the network's development: a general boundary object is about 'ground rules' and is created in early stages of a network's life (or starting a new one), while specific boundary objects are created to deal with more fine-tuned issues.

Multi-actor interactions and the co-construction of meanings are central to hybrid agricultural learning. In this context, boundary work that helps to achieve LINSAs goals is multifunctional, with a diversity of actors, but each LINSAs is different. Thus SOLINSA proposes the concept of transition partners, which may include various kinds of innovation intermediaries. Boundary work can embrace encounters, practice and specific work. Increasingly, boundary work is virtual.

In LINSAs learning, boundaries have to be negotiated between various knowledge bases, attitudes and learning forms. Boundary work and boundary objects evolve as networks develop. Boundary work and boundary objects are instrumental in consolidating innovation. They help internal integration in the LINSAs, the mobilisation of external supporters and the adjustment of network goals. Boundary work also is used to accommodate different attitudes towards sustainability.

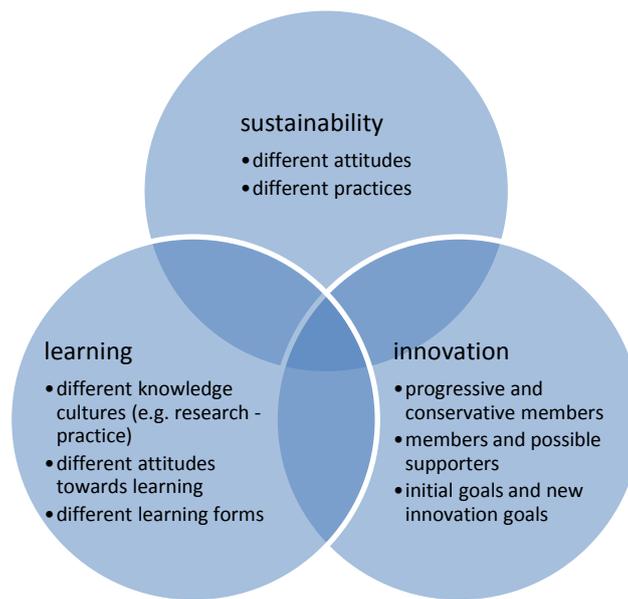
Boundary work is needed with regard to 1) involving the more conservative parts in the network – to accept innovation, and 2) possible supporters or users of the innovation outside of the network, 3) as well as adjusting the network goals to include new innovation goals, once the initial goal has been achieved, and/or new opportunities are identified.

Boundary objects in LINSAs have to provide the space for its members to negotiate three outcomes of the networks: learning, innovation, and sustainability. For each, boundary objects and boundary work have particular requirements (see Figure 1).

With regard to sustainability, boundary work needs to accommodate different attitudes and practices of sustainability; with regard to learning, the boundary objects used need to enable negotiation between stakeholder groups representing various knowledge cultures (e.g. practitioners and researchers), various attitudes towards learning outcomes /mistakes, and various learning forms; with regard to innovation, boundary work is relevant to negotiate between progressive and conservative parts of a LINSAs, between LINSAs members and potential supporters, and to adjust initial goals when they have been achieved

and/or new opportunities are identified. While most of these functions regard the internal organization of the network, in particular sustainability and innovation need additional boundary work between the LINSAs and the outside world. Reaching relevant actors beyond the limits of the LINSAs is crucial if innovation is aiming at changing regime.

Figure 1: Requirements of boundary objects in LINSAs: aspects BW has to bridge



2.4 LINSAs and socio-technical change towards sustainable agriculture and rural development

Socio-technical transitions can be used to explore the drivers and barriers of innovation, and 'framing' can be used to explain motivation for change and its realisation. In these contexts, change relating to LINSAs can be seen in simultaneous membership of different networks; the desire to belong to a specific community; political and policy changes, economic, social and natural shocks and social movements.

LINSAs tend to be niche or novelty projects at the margin of mainstream agriculture but others may impact at a regime level. They all undertake some form of transition from their inception and fit well into the policy rhetoric of trying to make agriculture in general more sustainable. It is often necessary for LINSAs to begin outside of mainstream agriculture in order to infuse sustainable actions within it. Such LINSAs invariably have a broader constituency than conventional agriculture – the constituency from where new ideas come. Not all LINSAs have an equal – or even significant - impact on change.

The conventional AKS plays a varying role in knowledge and innovation in

LINSA. In some instances it is ill equipped to do so and in others there is a resistance on the part of LINSA to seek the support of the AKS.

SOLINSA research explored LINSA both as novelties and niches and developed niche–regime integration typology: several modes of interaction were distinguished based on strong, moderate and weak LINSA compatibility with the regime (Ingram et al. 2015 forthcoming).

Whatever the level of the compatibility between LINSA and regime, all LINSA however, should build alliances and partnerships with regime actors that appear relevant for their consolidation and development. Extending networks and establishing effective networking between the LINSA and regime actors have proved to be helpful to facilitate diffusion and upscaling of innovation.

Key elements in LINSA transition are: reflection on the status quo; action for new sustainable solutions, and dissemination of good practice. They should acknowledge the regimes and the localities in which they operate even though some may be less compatible than others. Transformation in this context should be both social and technical and these should be interdependent. Incremental innovation can be as successful as radical innovation as it is more likely to be adopted more widely at regime level.

Socio-technical transitions aiming at fundamental and holistic changes in existing patterns are rather slow, multi-level and complex processes. Firstly, they demand transformations in actors' (be they farmers, policy makers, consumers, researchers, advisors, processors or other actors) cognitive structures, their frames and values which are rather resistant to rapid changes. Therefore not surprisingly, SOLINSA cases show that gradual incremental innovations reach transformations at regime level more easily as they face less resistance both from a social and a technical point of view. However, radical innovations, even if they remain local and scale up or diffuse more slowly, are important backbones for sustainability transitions as they demonstrate the feasibility of alternative life and working styles and serve as valuable sources of knowledge and inspiration.

3 RECOMMENDATIONS FOR SUPPORTING LINSA

The concept of LINSA builds on the insight that solving many of the complex problems of the agricultural and rural development sector, cannot be done by a single actor alone, but requires the involvement of different kinds of stakeholders in the innovation process (Knickel et al. 2009; Hermans et al. 2013). LINSA have developed as multidisciplinary and intersectoral networks in which joint (or social) learning and negotiation takes place and knowledge is co-created (Bos, Brown, and Farrelly 2013; Reed et al. 2010; Leeuwis and Van den Ban 2004). SOLINSA has shown that in many cases LINSA are able to stimulate the necessary change in the existing AKS.

Thereby we take two perspectives (see Figure 2): i) how the agricultural knowledge system (AKS) – taking the lessons from SOLINSA – could respond more efficiently and effectively to the new societal challenges related to agriculture and ii) how LINSA can contribute to changing the established institutions (AKS).

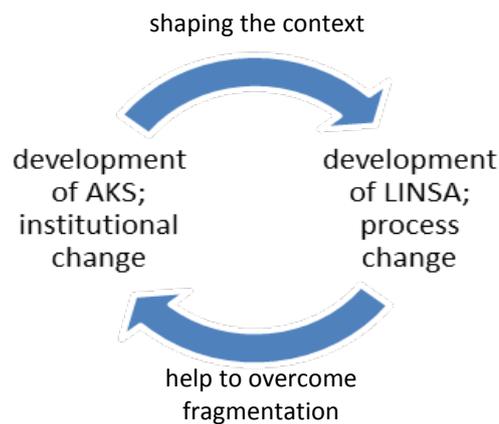


Figure 2: Mutual influence of LINSA and AKS

3.1 The challenges in supporting change of the AKS

Challenge 1: How can AKS support learning and innovation in LINSA?

Fragmentation of AKS, differing loci of interest, value systems, organisational barriers and orientation towards short-term goals leads to inefficient knowledge exchange and high transaction costs for those who exchange. Current AKS offer does not fit well the LINSA knowledge and networking needs, plus learning style (mutual learning, co-learning); while LINSA specific niche knowledge often remains unknown and unrecognised. Interactive and double loop learning is hampered, which stifles innovation potential. The challenge is to re-imagine the role of the AKS in order to better respond to the diversity and complexity of knowledge flows in agriculture, and to become a supportive partner in transition towards sustainable agriculture for bottom-up networks.

Challenge 2: How can AKS support LINSAs as drivers for bottom up innovations?

Complexity of contemporary agricultural and rural innovations (economic, technical, social, organisational), high stakes and uncertainties related to changing context and external pressures (market shocks, climate change, societal transformations), the increasing knowledge intensity of innovations and proliferation of innovation actors (farmers, researchers, advisors, consumers, food chain actors, governing bodies, etc.) determine transition towards a network model of innovation. In this model, bottom-up innovations and various kinds of networks play crucial role. Many LINSAs emerge as small bottom-up initiatives, some grow bigger, involve new participants and become formalised however retain the network structure and logic of operation. The new framework of European Innovation Partnerships (Van Oost 2013, HLSB 2013, EC 2013a) promote networks and operational groups as appropriate multi-stakeholder arrangements for innovation. These networks have to be recognised, activated and skilfully managed. The AKS can learn from successful LINSAs and embody achievements into their routines. This implies that LINSAs can be seen as drivers of institutional change, and the link between LINSAs and AKS is appropriately managed. The challenge is to acknowledge diverse forms and arrangements of LINSAs as legitimate, to understand the evolution of LINSAs and their evolving knowledge needs, and to provide a targeted support to network management through stewarding collaboration, and reflect on the process of collaboration.

Challenge 3: What are the specificities of research to support LINSAs?

Research can play a role in supporting LINSAs, and the challenge is how to organise research in a way that mutual benefit is maximised. For meaningful support of LINSAs, one has to identify what their problems are. For LINSAs themselves to identify their problems and challenges, they need to find a space in which they can reflect on themselves. Research can open up such a space and empower LINSAs to reflect by enabling them to step out of their daily routine. The form of this space and how this space is used is a matter of continuous negotiation, and such a process needs skilful researchers who have the capacity to do so and are willing to engage in the collaboration themselves. This points to the value of participatory research.

In participatory research however, processes are difficult to control; the results are unpredictable and sometimes indeterminate; and there are intangible results, such as improvement of relationships and trust building, which are difficult to quantify (Pohl & Hirsch Hadorn, 2008). The frequent (even if virtual) presence of transdisciplinary researchers; in the forms of individual or group coaching, following actions, and accompanying or enabling group dynamics, can greatly enhance assistance to the LINSAs.

Conclusions on the challenges: Changing perspectives to support LINSAs

- Acknowledge the diversity of LINSAs
- Consider and accept LINSAs as drivers of transition towards sustainability
- Assist LINSAs in strengthening their organisation, and in building capacity and skills for developing over the long term.
- Assist LINSAs in accessing funding: As LINSAs evolve, their support needs, and relevant activities to address those needs, change.
- Carefully develop and manage the links between LINSAs and AKS, acknowledge and use different ways of collaboration with LINSAs
- Acknowledge the new realities of knowledge co-creation, as opposed to linear top-down approach
- Acknowledge the variety of existing knowledge; knowledge needs and sources involved in creation and dissemination of innovation in agriculture
- Foster needs-based, diverse, participatory learning forms; mutuality and diversity of interactions with actors in agricultural innovation systems
- Shift self-perception and attitude from an expert knowledge provider to transition partner

These challenges and the required need of change in perspective concerns all actors of the AKS: advisory services, education and training, research; as well as policy. In the following chapter we have sorted our recommendations according to the different target groups, and we describe the new roles and functions of *transition partners*. All recommendations are based on the findings of different deliverables and papers written during the course of the SOLINSA project: Ingram et al. 2013: WP4 Synthesis report; Burkart et al. 2013: Report on Policy Implementation Tools; Home and Moschitz 2014: WP5 Synthesis report on the learning process; Hermans et al. 2015 forthcoming; Helmle et al. 2015 forthcoming.

3.2 Recommendations for AKS actors

Education and training

Education and training at all levels is essential to develop the basis for changing the perspectives on agricultural innovation for sustainability and a new understanding of learning as co-creation of learning. The following points emerged from the work in SOLINSA:

- Give LINSAs opportunities to teach e.g. at agricultural colleges, or to cooperate with technical institutes in their work fields
- Provide AKS personnel with training to develop skills in facilitation, brokerage and translation of research.
- Acknowledge that traditional teacher-led training will not always be appropriate. A new cadre of professionals is also needed to support

organisational development and network coordination, as this is not within the scope of advisory services.

- Train soft skills for diverse interactions which should include methodological competences (facilitation methods, group dynamics, conflict management, reflection), communication and co-operation, leadership, organisational development, and change management

Advisory services and extension

Extension plays an important role within the AKS to continuously support innovation. From our research in SOLINSA, we recommend the following measures to support effective knowledge sharing and co-creation:

- Provide networks with access to training funds, specifically targeted action research funds, and funds for research development projects to improve LINSAs performance and strengthen their position.
- Disseminate knowledge on specific issues and knowledge exchange through co-organisation of public events (fairs, seminars, workshops).
- Consult LINSAs on specific niche issues in which they are experts, as well as in policy formulation processes.
- Produce user-oriented learning tools (e.g. videos, manuals) in co-operation with end-users (LINSAs).
- Support interactive platforms (e.g. blogs, websites) for cross-sectoral exchange (organisational, technical, etc.) with actors from other knowledge systems (e.g. health, education).
- Build on the strong voluntary cooperation ethic in some LINSAs.
- Acknowledge the value of experiential training activities (field days, demonstrations, visits, seminars, etc.), as well as field trials in co-operation with practice partners / end-users.
- At the level of the organisation capacity needs to be improved in governance, project management, leadership, coordination.
- Be open minded to helping LINSAs to access different knowledge systems that might lie outside the traditional AKS knowledge.
- Base the relationship between LINSAs and AKS on mutual understanding, and reciprocity. No AKS institution can gain full control over LINSAs without reducing its creative potential.

Researchers and research policy

Participatory research can assist LINSAs in developing their potential, but this needs to be a thoughtful approach and include a phase of carefully approaching the networks before effectively working with them. Participatory research requires particular skills of researchers, and these have to be learned and practiced. Research policy can enhance such approaches (Home and Moschitz, 2013). We therefore offer the following recommendations:

Approaching networks:

- When approaching a network, identify and establish an alliance with one or more representatives of the target organisation who are willing to engage in participatory action research.
- Maintain the relationship between the researcher and the LINSAs representative(s). Individual contacts are essential although they can also act as a gatekeeper and might exclude other people from involvement.
- Gain as much understanding of the power relationships within the LINSAs as possible before starting the research. This understanding can be achieved by applying classical qualitative research methods, such as guideline based interviews, document analysis, and open observation of events.
- Approach potential key partners with the aim of gaining acceptance from the organisation. It is important to be transparent about the intentions for the collaboration; including roles and objectives.

Working with networks:

- Build trust with the participants. Trust is a prerequisite for participatory action research, and is dependent on a psychological contract in which the aims, success criteria, framework, useable methodologies, mutual expectations, and rules of co-operation are clearly defined.
- Respond to critical LINSAs needs: An appropriate way of defining common interaction objectives.
- Meet in person and actively maximise participation. Meeting in person is essential to collaboration, and maximum participation can be enabled by locating workshops in places that make attendance easier, such as piggybacking workshops onto existing LINSAs events.
- Establish a mutually acceptable strategy from the beginning of the collaboration: Participatory methods occupy valuable resources from both parties.
- Maintain channels of communication that provide the LINSAs with tangible evidence of the achievements throughout the interaction. LINSAs are more likely to continue to participate if the benefits of involvement are demonstrated.
- Offer skilled facilitation of processes or workshops, or provide material facilities, such as meeting rooms or research facilities. Potential support can also be substantive with specific expertise, such as in policy analysis or in the application of communication technologies, and can facilitate LINSAs interactions.
- Be aware of the potential for research fatigue amongst partners, which is likely to be highest amongst those who are the most involved, and therefore most interesting for further collaboration in the research.

Facilitation skills:

- Manage the collaboration, but do not attempt to impose methodologies. For example, if workshops are found to be ineffective in enabling co-creation of knowledge, the researchers may choose to conduct complementary interviews or observations and find ways to ensure that all voices are heard.
- Use playful exercises, visualisations, small group discussions, facilitated discussions, and methodologies with a special interest, such as theme related games, to enhance interaction during collaboration. These have to be appropriate to context and seen as useful and desirable by the specific LINSAs.
- Although the objectives of the research have to be made clear from the beginning, ensure that the different steps, including the methods and the time frame, stay flexible.

Training of researchers and quality assessment:

- Ensure researchers are equipped with sufficient knowledge of methods and tools so that they can quickly and professionally respond to the individual needs of the collaborating LINSAs. It is the responsibility of the facilitating researcher to enable collaboration, which requires competence in participatory methods (of research) and in particular in facilitation skills. This requires training, which is often not offered in current higher education.

Research policy:

- Rethink the standard quality criteria for scientific work so that they include the specific requirements of transdisciplinary research processes, which follow the logic of data acquisition and intervention. This needs attention both at the level of research institutes (in assessing their staff) as in research policy and funding (assessing project proposals and outcomes).
- Include LINSAs representatives in the evaluation process for research projects. Providing the units of study; in this case LINSAs, with power to decide which research will be funded would enhance relevance and applicability of research approaches.

3.3 Recommendations for policy actors

3.3.1 LINSAs in the context of European innovation policy

This chapter describes how LINSAs can be supported by European innovation policies. Within the “Innovation Union”, the European Union has adopted a wide range of innovation policies. The European Innovation Partnership (EIP) is one of the main instruments, and the EIP on Agricultural Productivity and Sustainability is one of the first that has been put in place. At its core are so-called Operational Groups (OG) in which different actors from rural areas (e.g. farmers, researchers, advisors, business) collaborate to jointly develop socio-

technical innovations. Funding is provided through the European Agricultural Fund for Rural Development (EAFRD).

Research and innovation are needed to guarantee sustainable productivity gains as well as encouraging economic viability and accessibility of possible solutions. According to the High Level Steering Board (HLSB 2013) nominated by the European Commission, the establishment of a favourable innovation culture "*implies a change of the mind-set at all levels*" and "*...exchanges between all actors, sharing traditional and scientific knowledge, relying on a bottom-up approach and strengthening networking, engaging in developing practical solutions, identifying and developing lighthouse projects, mobilising innovation brokering, and developing social and institutional innovation.*" The EIP therefore follows an interactive innovation model with an emphasis on partnerships. Similarly, the new research framework programme, Horizon 2020, promotes multi-actor research.

LINSA can be seen as a prototype for multi-actor innovation groups (e.g. OG), and the SOLINSA project provides insight into how they can be supported.

3.3.2 Recommendations for the AKS to support social learning in innovation networks

The practical implications from our study for the support of grassroots innovation, collaboration, and social learning can help to assist the organisation of the new EIP and their Operational Groups as a policy tool to improve innovative efforts across the EU. Collaboration and social learning can be used to solve a number of different problems, and it is important to start the implementation of a policy, such as the EIP, with a critical reflection on the problems that it wishes to address in a specific national agricultural innovation system with its specific AKS.

The comparative analysis showed a great diversity in the organisation of AKS (see Annex 2). Traditionally organised AKS typically have difficulty in dealing with the generation and acceptance of radical new ideas. The organisation and promotion of LINSA in these countries therefore provide far more of an opportunity to try and incorporate some of 'outsiders' into the existing AKS networks. However, the lack of formal education; especially of smallholder farmers, hampers their ability to organise themselves in these collaborative innovation networks. It is difficult for them to be viewed as valuable partners within such networks and to have their interests heard.

More pluralistic AKS (e.g. a diverse privatised advisory and extension service) on the other hand, have problems in coordinating innovations for long-term environmental issues and other typical public goods. The aim of supporting these innovative networks is therefore to coordinate a shared vision in order to work on solving some of the long term public policy goals that would otherwise not be achieved.

A basic conclusion from analysing the LINSA is that effective support needs to incorporate a strong focus on process, thus going beyond technical/content support.

Box 1. Underlying principles of social learning

- Social learning emerges from a shared interest in a problem, challenge or activity; the actors bring in expertise.
- Social learning does not happen on its own. It is linked to processes of trust building, trial and error and mutual support. Social learning is an answer to very complex issues. Mutually reflection on knowledge and consciously hearing different perspectives on one common issue enhances the portfolio of potential solutions.
- Activity of AKS should aim at setting free and mobilising untapped - and often unknown – resources

Table 2 provides a list of measures that may go in this direction. All of these measures can be activated through the instruments of the next planning Rural Development Plans (RDP) period, provided that RDP set the appropriate criteria for participation.

Table 2: Measures to let AKS develop social learning

Level of support	Support measures	Access to existing RDP measures
<i>1 Direct support of LINSAs – support the collaboration and performance of LINSAs</i>	1-1: Soft skills development 1-2: Reflection periods and process monitoring 1-3: Boundary object development 1-4: Travel costs / expense allowances 1-5: Operational / running costs 1-6: Training / Educational offers 1-7: Restructuring of funding schemes	Article 36: cooperation Article 15: Knowledge transfer and information actions Article 16: Advisory services
<i>2 Transition partners - support of actors working with LINSAs</i>	2-1: Transition partner training 2-2: Transition partner networks 2-3: Cross-sectoral activities – intermediary persons 2-4: Training for participatory research 2-5: Incentives for practice-research co-operation	Article 15: Knowledge transfer and information actions Article 28: Setting up of producer groups Article 36: cooperation

(for a more detailed description see Burkart et al. 2013)

3.3.3 Supporting LINSAs to foster institutional innovation

LINSAs develop innovations without being constrained by hierarchies and agendas existing within traditional AKS. Being placed at the margins of traditional AKS; they enjoy more freedom of movement. The AKS can learn from successful LINSAs and embody achievements into their routines. This implies that LINSAs can be seen as drivers of institutional change, if the link between LINSAs and AKS is appropriately managed.

Table 3 provides a list of possible support measures aimed at improving the interaction between LINSAs and AKS. They can be activated through the RDP measures of the next planning period, provided that national Rural Development Plans identify appropriate criteria for participation.

Table 3: Policy measures that may foster interaction between LINSAs and AKS

Level of support	Support measures	Access to existing RDP measures
<i>3 LINSAs and AKS – recognition, collaboration and mutual acceptance</i>	2-1: Recognition of LINSAs 2-2: Consulting LINSAs knowledge 2-3: Research funding 2-4: LINSAs and AKS co-operation	Article 36: Cooperation Article 15: Knowledge transfer and information actions
<i>4 LINSAs-LINSAs networks, EIP and Operational Groups (OG) – developing multi-actor perspectives</i>	4-1: LINSAs-LINSAs networks 4-2: LINSAs operating as OG 4-3: Using a participatory approach in OG	Article 36: Cooperation Article 62: Operational groups

(for a more detailed description see Burkart et al. 2013)

Through enabling frameworks for exchange, LINSAs will be more visible in the Agricultural Knowledge and Innovation System (AKIS) and gain credibility. AKIS actors can learn from LINSAs as they become accepted opinion leaders and experts for specific niches. This will help AKIS in reaching the goal of a more sustainable agriculture and one that accepts the high level of diversity of farms and logics of farm development. By passing their knowledge through formal AKIS channels, LINSAs will gain credibility and legitimisation. Together, co-creation of innovation and knowledge can happen.

3.3.4 Projects to support cooperation and mutual learning of LINSAs and AKS

Specific projects could help an efficient and effective co-operation between AKS and LINSAs and result in both LINSAs development and a shift of the AKS towards more sustainability:

- **Facilitate the animation of bottom-up initiatives**, help to refine innovative ideas, provide support for finding partners, provide support for finding funding / other assistance
- **Facilitate partnerships of learning**: facilitate the analysis of existing learning processes and the stimulation of an open process of reflection
- **Document processes of learning and innovation** and make them available for the broader public, facilitate knowledge exchange.

3.4 Transition Partners for supporting LINSAs

Changing the perspective of the different roles and functions of AKS actors, and the focus on supporting a process of social learning that leads to transition to a more sustainable agriculture and rural development, brought us to the introduction of a new concept of AKS actors: **transition partners**. Transition partners support social learning and the related group dynamic processes; especially through a methodological approach, and can fulfil different roles and functions (see box 2).

Box 2. Roles and functions of transition partners (see Helmle 2013 and Helmle et al. 2015 forthcoming)

1. Internal strengthening and advancement of the LINSAs – as a **facilitator**
2. Participatory data collection and analysis – as a **participatory researcher**
3. Methodological support in the development and establishment of boundary objects – as a **boundary person**
4. Technical support in the development and establishment of boundary objects – as an **expert, lecturer or trainer**
5. Support in improving the recognition of LINSAs in the AKS and in increasing networking activities – as an **intermediary person**
6. Support to developing European Innovation Partnerships and Operational Groups – as an **EU innovation broker**

The concept of transition partners allows a differentiation of professional intervention in the work of AKS. The new requirements for transition partners need particular support, which is not granted so far within the traditional AKS as they transcend the functions and roles of traditional extension workers.

Training and support of transition partners is particularly needed in the following fields:

- Methodological competence for accompanying innovation and learning processes:
 - Participatory methods for education with adults
 - Methods allowing the establishment of trust among different actors
 - Knowledge of potentials and challenges of group dynamics and change processes.
- A network of transition partners enables to gain clarity about the tasks; collegial advice helps clarifying complex problems and finding inner distance to ongoing working processes.

In their different roles, transition partners can assist LINSAs in various ways, and the recommendations given above for AKS actors account for them, as well. By introducing this new concept, we want to emphasize a new understanding and approach of how to support innovation for sustainable agriculture.

4 CONCLUSION: FIVE SOLINSA LESSONS TO TAKE HOME

From the three-year-long engagement in collaboration and research with LINSAs, we have distilled five main insights that may inspire and inform future research in this field:

1. LINSAs are networks of producers, consumers, experts, NGOs, SMEs, local administrations as well as official researchers and extensionists, that are engaged in sustainable agriculture and rural development - cooperating, sharing resources and co-producing new knowledge by creating conditions for communication.
2. There are different forms of LINSAs. LINSAs can have a strong relationship with the AKS or not be connected to the AKS at all, or a relationship that lies between these extremes. In all these forms, LINSAs provide mechanisms, such as structure and governance, that allow learning and innovation.
3. There is a need for opening spaces and creating an environment in which LINSAs can develop their full potential to contribute to innovation for sustainable agriculture. These spaces can go beyond the established AKS. Such an environment should also enable continuous reflection about innovation processes and outcomes; as sustainable development can only be achieved in the long run in such a reflective process.
4. Despite fragmentation and criticism of the AKS, many AKS actors already collaborate with LINSAs and jointly produce sustainable innovations. This AKS role as LINSAs partners has to be strengthened. LINSAs can take an active position in inspiring change in AKS, policies, industry and civil society to activate their learning and innovation practices. These LINSAs – AKS – Policy – civil society links need to be strengthened; especially by developing forms of collaboration between the actors.
5. In this situation, transition partners emerge as new kind of actors, with particular roles and functions. These are various kinds of networkers, facilitators, participatory researchers, boundary persons, or experts who engage with LINSAs in joint learning and innovation for sustainability. Partly, LINSAs actors can themselves fill the different roles, or they purposefully approach external actors (including civil society and policy actors). Transition partners assist LINSAs in developing their potential and support them in acquiring the knowledge and networks they need to achieve their goals. Transition partners' ethos and practices need to be recognised and accepted in the official AKS structures, which would help to activate positive changes within AKS itself.

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ANNEX 1

Measures of the new RDP relevant to innovation

The EAFRD refers to innovation many times and highlights several measures facilitating / funding innovation in the EU which could be addressed to LINSAs support.

Article 15: Knowledge transfer and information actions: Covering of vocational training and skills acquisition (e.g. training courses, workshops, coaching), demonstration activities and information actions (e.g. investment costs, travel and accommodation costs, per diem expenses, farmer replacement costs), as well as short-term farm management exchange and farm visits.

Article 16: Advisory services: Support measures to ensure advisory services for improvement of economic and environmental performance as well as climate friendliness and resilience of farms, forest holdings and SMEs in rural areas, to set up advisory services for farms and forestry, and to promote training of advisors.

Article 28: Setting up of producer groups: Support of setting up of producer groups with the purpose of adaptation of production/ output to market requirements, joint product placement on the market (e.g. preparation for sale, centralisation of sales), establishment of common rules on product information (e.g. harvesting and availability), and other activities carried out by producer groups (e.g. development of business/ marketing skills, organisation/ facilitation of innovation processes).

Article 36: Co-operation: Support of co-operation approaches among different actors in the Union agriculture and food chain, forestry sector, and among other actors, that contribute to achieving the objectives and priorities of rural development policy. Support of the creation of clusters and networks. Support of the establishment and operation of operational groups of the EIP. Co-operation includes e.g.: pilot projects, the development of new products/ practices/ processes/ technologies in agriculture and food sectors, the organisation of joint work processes with shared facilities and resources (small operators), horizontal and vertical co-operation among supply chain actors, promotion activities in a local context, joint action for climate change mitigation/ adaptation, or collective approaches to environmental projects/ practices. Results of pilot projects and operations by individual actors should be disseminated. Co-operation among actors located in different regions/ Member States should be eligible for support.

Article 62: Operational groups. They shall be set up by interested actors such as farmers, researchers, advisors and businesses involved in the agriculture and food sector.

ANNEX 2

Structural analysis of AKS and their potential effects on collaboration and social learning (Hermans et al. 2015 forthcoming)

	EN	FR	DE	HU	IT	LT	NL	CH	Potential effects on collaboration and social learning
Infrastructure, investments and funding									
Lack of funds / decreasing funds	X	X		X	X	X	X	X	More competition and more insecurity are not conducive for collaboration, sharing of resources and learning.
Legislation, rules and regulations									
Overregulation, bureaucracy and volatility of topics and criteria		X	X	X			X	X	Collaboration for collective goods are difficult to set up; Continuity/ stability of collaborative networks is threatened; long term effects are not invested in
Monitoring, assessment and evaluation of projects and programmes is not consistent and systemically done		X	X	X	X		X	X	Learning experiences not fully incorporated
Norms, values and culture									
Social capital and trust low or decreasing	X	X	X	X	X	X		X	First steps towards collaboration is difficult
Contested vision of the future leads to competition between different innovation coalitions.	X	X	X		X	X	X	X	Can be a strong motivator: 'us against them', but can also easily lead to wasted time, energy and resources on political struggles
Interactions and networks									
Vertical and horizontal fragmentation and lack of coordination	X	X	X	X	X	X	X		Overview is missing of who does what; potential collaborations are difficult to establish if organisation are not aware of each other.
Capabilities									
Education and specific information skills are often missing (confusion of knowledge consumers)	X			X		X	X	X	Difficulty in formulating knowledge questions and information needs hampers learning.
Barriers for interaction in different types of organisational logic and incentives (science and farmers especially)	X	X	X		X	X	X	X	Individual goals and incentives of people with a different affiliations can be difficult to overcome
Market structure									
Lack of demand of information services			X	X			X		Dependence on embedded advice in commercial agro-industrial products discourages participation in innovative projects that might threaten these old products
Increasing competition between knowledge providers	X	X	X	X	X	X	X	X	Too many competing advisory service providers can create confusion, add to the bureaucratic burden and do not streamline the collaborative process anymore