



# ATTRACTISS

Empowering Innovation  
Support Services

## Deliverable 1.1

Conceptual grounds and common  
understanding: state of the art

Report | PU



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## List of acronyms

AIS	Agricultural Innovation System
AKIS	Agricultural Knowledge and Innovation System
CAP	Common Agricultural Policy
CD	Capacity Development
CECRA	Certificate for European Consultants in Rural Areas
EIP-AGRI	European Innovation Partnership for Agricultural Productivity and Sustainability
EC	European Commission
EU	European Union
GFRAS	Global Forum for Rural Advisory Services
ISS	Innovation Support Service
MA	Managing Authority
MAA	Multi Actor Approach



MLP	Multi-Level Perspective
MS	Member State
NGO	Non-Governmental Organization
OG	Operational Group
SCAR AKIS	Standard Committee on Agricultural Research, Agricultural Knowledge and Innovation Systems
UNDP	United Nations Development Programme
ZLTO	Zuidelijke Land- En Tuinbouworganisatie Vereniging



## Executive Summary

This deliverable provides a first description of the characteristics of Innovation Support Services (ISSs).

Basing on the current literature and experience, it presents an overview of the actors carrying out such services, the main functions identified and the competencies that are required to provide Innovation Support Services.

The main aim of the document is to facilitate a common understanding among ATTRACTISS partners, CAP Managing Authorities, AKIS actors and general readers, regarding ISSs, so as to inspire the organization of efficient and well-integrated ISSs across the 27 EU Member States.

ISSs can be provided by a variety of providers according to different policies/strategies, that depend on the specific innovation/project, the phase of the innovation process, the characteristics (governance, funding, competences, etc.) of service providers and the context in which these processes take place. Besides traditional agricultural advisory services, new actors, either public or private, belonging both to the agrifood sector and to other sectors, can drive innovation processes (even the same process), acting under a specific mandate, but also according to their own interested in pushing the innovation process forward.

ISSs depend on the phase of the innovation and each phase entails a wide range of support activities following the development of needs that in turn evolves according to a variety of context and innovation-related factors. The diversity of services provided to support innovation processes were summed up into 7 functions, which have been further articulated in activities, as showed in table 1. Among the others, the function 'networking, facilitation and intermediation' (ISS 4) is transversal and contributing to/facilitating the other functions and it is crucial to trigger and drive the innovation process in all its phases. All the functions are characterised by the high content of soft skills, especially the Advisory, consultancy and backstopping (ISS 2) one, where the ability of the provider to 'handle' the production process, communicating, listening, combining technical capacities and interactional expertise and facilitating the connection with other services, is a key for the development of multi-actor project pathways.

An extensive overview of the competencies needed to provide innovation support services has been recently carried out within the i2connect project. The framework is mainly focused on competencies needed to manage the network

during the innovation process and less on the upstream and downstream phases of it.

This state of the art represents the basis for starting the ATTRACTISS activities, which will be grounded on multi-actor approach and capacity development. ATTRACTISS' capacity development pathway is intended to link individuals, as well as organizations and the enabling environment to address, in addition to individual capacities, broad questions of institutional change, empowerment and participation. It will be co-developed through an iterative design-application-learning-adjustment process applying multi-actor approach. Multi-actor approach is an important part of any capacity development intervention, since it allows building the combined as well as the individual, organizational and institutional capacities and may enhance the quality of interventions that influence their interrelationships through effective mobilization of actors at different levels.

# 1. Introduction

## Purpose of the report

The overall purpose of this deliverable is to facilitate reflection among ATTRACTISS partners, CAP Managing Authorities, AKIS actors, and general readers regarding:

- (i) who are the actors who provide innovation support services (ISSs),
- (ii) what functions they perform in the different phases of innovation processes,
- (iii) what skills and competencies they need to support interactive innovation processes.

The description represents a state of the art since it is entirely based on current literature and experience. The deliverable will be revised at month 64, to incorporate lessons learned from project activities and consolidate theoretical and practical knowledge about ISSs throughout EU Member States.

This document is finalised by a methodological note aimed at steering all project actions, as well as criteria for gathering information on ISSs in the 27 Member States and identifying practical cases to learn from and build new expertise on.

## Relation with other activities in the project

This deliverable provides a baseline, as well as a methodological approach, upon which to develop all the following project activities.

Furthermore, it is specifically connected to:

- tasks 1.2, providing criteria for gathering information on ISSs in the 27 Member States
- task 1.3, framing the scope of the task within the overall project approach
- task 1.4, providing a baseline upon which co-build feasible and effective ISSs curricula
- task 4.2, providing criteria for identifying practical cases to be deepened through peer reviews

## Objectives and expected impacts

This deliverable is intended to contribute to the dissemination of a common understanding of ISSs across the 27 Member States and to inspire the organization of efficient and well-integrated ISSs.



## Methodology

This deliverable grew out of the discussion around the ISS concept started during the ATTRACTISS Kick-off meeting, held in Florence from 17 to 19 October 2022.

In the first month of the project, all partners committed to deepening existing knowledge and providing insights into the state of the art. An initial structure of the deliverable was presented and discussed at the partners' meeting organized on the 17<sup>th</sup> of November. In this meeting, the partnership reached a consensus on the description of the ISS functions and the criteria for the mapping of ISSs were also deliberated. Specific aspects were also addressed in further meetings:

- 29 November: meeting organised by Task 1.2
- 29 November: meeting organised by WP5 and WP2
- 1 December: monthly partner meeting
- 11 January: meeting organised by WP5
- 12 January: monthly partner meeting

A consolidated draft of the deliverable was uploaded to the shared platform in early January to allow all partners to review the document and provide further insights.

## 2. State of the art on Innovation Support Services

The new CAP Regulation (EU) 2021/2115 requires EU Member States (MS) to provide support for innovation, in particular for the preparation and implementation of the EIP-Agri operational groups (OGs). The expected result is a general improvement of connections between actors, policies and programmes/projects, knowledge(s) and experience(s), methods and instruments to speed up the creation of innovative solutions.

Innovation support services (ISSs) represent a novelty from a policy perspective and, therefore, require governance models, approaches, competences and tools that foster their effective implementation and embedding in the respective national/regional AKIS.

The term 'innovation support services' came into the mainstream a few years ago and it is new in the CAP framework.

The implementation of the European Innovation Partnership (EIP) for agricultural productivity and sustainability has fostered the introduction of a systemic perspective of innovation, based on the involvement of a diversity of actors (multi-actor) and user-centred, to address complex socio-ecological challenges that often require transformative forms of innovation, capable of promoting more sustainable and resilient development paths (Beers, Sol & Wals, 2010; Moschitz et al. 2015; Ingram et al. 2020; Fieldsend et al, 2021). Within this perspective, which configures innovation as an interactive (or social) learning process (§ Annex 1), agricultural extension and advisory services take on new roles and functions, which include facilitation of exchange, learning, vision building among diverse communities, mediation of conflict situations, network and knowledge brokerage, matching of demand and supply of innovation support services (Koutsouris 2018; Leeuwis & Aarts 2011).

To date, there is no clear definition of the term ISS, neither in-depth analysis concerning the actors providing the services, their linkages with other actors and the support they provide to innovation processes. Furthermore, there is little awareness of the skills and competencies needed to improve services delivery.

The previous EU SCAR AKIS report (2019) listed some of the activities that should be provided by ISSs, but the contribution of these examples to the

organisation of innovation support is rather limited, especially in countries with pluralistic or/and privatized advisory systems.

However, a wide corpus of literature has been developed concerning roles, goals and functions of services aimed at facilitating innovation processes and/or fostering system innovations (Elzen et al. 2004; Geels, 2005; Barbier and Elzen, 2012; Faure et al., 2016; Knierim et al., 2017; Kivimaa et al., 2018; Leeuwis and van den Ban, 2004; Smits and Kuhlmann, 2004; Howell, 2006; Klerkx and Leeuwis, 2009; Heemskerk et al., 2011; Kilelu et al., 2013; Labarthe et al., 2013; Allebone-Webb et al., 2016; Steyaert et al., 2017). Actors providing services have been labelled as innovation brokers (Howell, 2006; Klerkx and Leeuwis, 2009b; Peréz et al., 2010; Herman et al., 2012; EU SCAR, 2012), free actors (Wielinga et al., 2008), hybrid actors (Elzen et al., 2012), facilitators (Cristóvão et al., 2012; Koutsouris, 2014), boundary spanners (Tisenkopfs et al., 2015; Vilas-Boas et al., 2022), pointing out to the diversity of strategies and functions played in carrying out their activities.

These studies have been extensively analysed by Mathé et al. (2016), who summarised the diversity of services and providers in supporting innovation under the concept of Innovation Support Services, term that may be understood either as an organizational body (called a service provider), or as an activity (Albert, 2000). Following Gadrey (1994) and Labarthe et al. (2013), Faure et al. (2019) describe ISS as an activity, that is “an immaterial and intangible service that involves one or several providers and one or several beneficiaries in activities in which they interact to address a more or less explicit demand emerging from a problematic situation and formulated by the beneficiaries and to co-produce the services aimed at solving the problem”. These authors refer to innovation support as “services that make innovation happen by fostering interactions and constructing knowledge”. Indeed, this term includes a wide range of activities aimed at creating the conditions for identifying and discussing solutions, opportunities and new ideas by combining perspectives, knowledge, experience and resources. They encompass the facilitation of networking, access to financial resources, support for actors to articulate clear demands, institutional support for niche innovations and scaling, capacity building of innovation actors, awareness-raising through the dissemination and exchange of knowledge, and the provision of general and backstop advice (Mathé et al., 2016).



## Actors

Identifying ISS providers requires in-depth analysis. In fact, ISS providers can differ considerably across EU Member States depending on whether advisory systems are public/privatised, integrated/fragmented, centralised/decentralised (Faure et al., 2019).

Recent studies have found that traditional agricultural advisory services are no longer the only or the main actors to support innovation processes, despite their historical role as intermediaries (e.g., knowledge/technology carriers) between agricultural research and farmers.

Indeed, innovation support functions can be performed by a variety of providers and according to different policies/strategies, depending on the specific innovation/project, the phase of the innovation process, the characteristics (governance, funding, competences, etc.) of service providers and the context in which these processes take place (Proietti and Cristiano, 2022; Faure et al., 2019; [i2connect AKIS reports](#), 2020; & Birner et al., 2009; Sutherland and Labarthe, 2022).

The rise of pluralistic advisory landscapes, the agricultural innovation policies promoted under EIP-Agri framework and the need to design solutions to complex problems have led to the rise of new actors, either public or private, belonging both to the agrifood sector (upstream and downstream industries, rural networks, cooperatives and consortia, farmers' organisations, Local Action Groups, etc.) and to other sectors (administrative services, project design and management services, strategic advisors, Non-Governmental Organisations, banks, etc.) (Proietti and Cristiano, 2022; Faure et al., 2019). As well, actors who did not play an advisory and mediating role but had extensive experience in the management of research projects (e.g., universities, research centres), have developed new capacities and competences (soft skills) to support multi-actor innovation processes within Rural Development Programs (Proietti and Cristiano, 2022).

The transition scenario taking place among ISS providers has also been fuelled by a 'vacuum' left by traditional agricultural advisors, who often lack the right attitude and competencies (especially social) to take on new roles as well as the willingness to abandon their 'comfort zone' (Klerkx and Jansen, 2010). However, recent studies show that efforts are ongoing, even among freelancers, to strengthen these capacities and reorganise their portfolio in order to broaden the range of services provided as ISS (Proietti and Cristiano, 2022).

Evidence shows that different actors can coordinate with other ISS providers to provide better support to farmers, as well as to be engaged in the same (interactive) innovation process (§ Annex 1) contributing, by performing different functions, to achieve successful outcomes (Proietti and Cristiano, 2022; Faure et al., 2019). Indeed, often, there is not a single service provider responsible for driving the whole innovation process. This is because the services which are needed evolve along the innovation process and might require different actors to be involved in a particular phase (Beers et al., 2014).

Furthermore, innovation processes can be supported not only by providers who have a specific mandate to provide services, but also by other actors, that are not specialised in the provision of services (e.g., farmers' organizations, farmers, public administration, etc.) who are interested in pushing the innovation process forward (Proietti and Cristiano, 2022; Faure et al., 2019; Cristiano and Proietti, 2014). This is particularly true for networking and intermediation activities which can be provided by a variety of actors acting at different phases of the innovation process to facilitate linkages and dialogue.

On the other hand, in those countries characterised by an integrated agricultural service system and a limited number of service providers, one dominant service provider can be responsible for a wide range of ISS functions (e.g., Teagasc in Ireland) or largely support innovation processes by interacting with and coordinating other service providers (e.g., the farmer-based organization Seges in Denmark and ZLTO in the Netherlands) (Faure et al., 2019).

## Functions and activities

Within the AgriSpin project, the diversity of services provided to support innovation processes were summed up into 7 functions (Mathé et al., 2016): access to knowledge; advisory, consultancy and backstopping; marketing and demand articulation; networking facilitation and brokerage; capacity building; access to resources; institutional support for niche innovation and scaling mechanisms stimulation.

These were later refined by Knierim et al. (2018; 2020) and Faure et al. (2019), as shown in the first two columns of table 1.

However, for the sake of clarity, in ATTRACTISS we decided to rename the first function identified by Faure et al. from 'Awareness and exchange of knowledge' to 'Awareness and knowledge dissemination'. This is because knowledge

exchange implies a two-way flow between two actors, whereas it is clear from authors' descriptions, that this function concerns basically one-way transfer of knowledge.

As stated by Faure et al. (2019), ISSs depend on the phase of the innovation and each phase entails a wide range of support activities (§ Annex 1).

The support needed in each phase cannot be pre-defined or clearly identified, because the development of needs depends on and evolves according to a variety of context and innovation-related factors. Nevertheless, in some phases, the provision of specific services is a necessary and imperative condition. For instance, during the initial phases of an innovation process, the support must provide the space and resources needed for key actors to innovate. Therefore, it focuses mainly on triggering exchanges, generating new knowledge, facilitating access to seed funds and the setting up of informal and flexible networks. Likewise, in the latter phases, there is a need for services aimed at ensuring the scaling and institutionalization of the innovation, both at farm, value chain and territory level. Besides traditional training and dissemination services, intermediation and institutional dialogue are key to ensure adequate embedding of innovation in value chains and in local territories and to design and enforce new arrangements towards institutionalization (Faure et al. 2019; Kivimaa et al., 2018)

As a part of the i2connect project, a study is currently ongoing in order to deepen, together with EU ISS providers, the functions proposed in previous projects/studies and to articulate the main activities encompassed by each of them, with the final goal of identifying a methodology for the simplification of ISS costs to be applied in the framework of the new CAP interventions. An early articulation of innovation support activities is summarised in the third column of Table 1.

**Table 1. Innovation support functions and activities**

ISS function	Definition	Detailed activities
<b>Source: Faure et al. (2019) and Knierim et al. (2018), based on Mathe et al. (2016) and Faure et al. (2017)</b>		<b>Source: Proietti P., Cristiano S., Lasorella M.V. (2022), working document for updating D3.4 of the i2connect project</b>
<b>ISS1. Awareness-raising and knowledge dissemination</b> <i>(new definition by ATTRACTISS consortium)</i>	All activities contributing to knowledge awareness, dissemination of scientific knowledge, or technical information for farmers. For instance, providing knowledge based on information dissemination forums (website, leaflets), meetings or demonstrations and exchange visits	Dissemination of information (website, brochures, magazines, newsletters, bulletins, webinars, etc.), organization of exchange visits, organization of demonstrations, etc. <ul style="list-style-type: none"> <li>○ Selection and evaluation of information</li> <li>○ Transformation of information into documents (targets: advisors, farmers, etc.)</li> <li>○ Language translation</li> </ul>
		Meetings
		Communication of project results
		Supply of knowledge and technical information for innovation (knowledge transfer) <ul style="list-style-type: none"> <li>○ Selection and identification of know-how and transfer of knowledge /technologies</li> </ul>
<b>ISS2. Advisory, consultancy and backstopping</b>	Targeted, supportive activities aimed at solving complex problems (e.g., a new farming system), based on demands of actors and the co-construction of solutions	Articulation of advisory needs / specific need to provide a more targeted support <ul style="list-style-type: none"> <li>○ Data and information gathering</li> <li>○ Design of tailored advisory packages</li> </ul>
		“Management” of the innovation process (soft skills) <ul style="list-style-type: none"> <li>○ Support to find specialized advice</li> </ul>
		Organization of backstopping pools (research / advisory / SME / etc.) to find a solution to a complex problem
<b>ISS3. Demand articulation</b>	Services targeted to help actors to express clear demands to other	Needs analysis
		Strategy and vision development

	actors (research, service providers, etc.). This is targeted support to enhance the innovator's ability to express his/her needs to other relevant actors.	Feasibility analysis
		Searching for ideas and solutions
		Building bridges with users and intermediary organisations to make the need concrete, defining its contents, specificities and costs
<b>ISS4. Networking facilitation and brokerage</b>	Provision of services to help organize or strengthen networks; improve the relationships between actors and to align services in order to be able to complement each other (the right service at the right time and place). It also includes all activities aimed at strengthening collaborative and collective action.	Partner identification and aggregation
		Internal: facilitation, mediation and conflict management (construction of the project proposal, definition of objectives, roles, knowledge exchange, collective learning, etc.)
		External facilitation: facilitation, mediation, network strengthening and conflict management <ul style="list-style-type: none"> <li>○ Mediating the relation with the MAs/Granters (ISS6)</li> <li>○ Mediating / building bridges with stakeholders and potential users</li> <li>○ Brokerage along the production chain (ISS7)</li> </ul>
<b>ISS5. Capacity building</b>	Provision of services aimed at increasing innovation actors' capacities at the individual, collective and/or organizational level.	Traditional training/Face-to-Face individual training
		Peer-to-peer facilitation/Coaching
		Experiential learning
<b>ISS6. Enhancing/ supporting access to resources</b>	Provision of services for innovators aimed at enhancing the acquisition of resources to support the process. This could be facilitating access to inputs (seeds, fertilizers etc.), facilities and equipment (technological platforms, labs etc.), and funding (credit, subsidies, grants, loans, etc.).	Facilitating access to facilities and equipment (technological platforms, laboratories, etc.)
		Facilitating access to inputs (seeds, fertilizers, etc.)
		Facilitating access to financial/insurance services
		Facilitating access to funding <ul style="list-style-type: none"> <li>○ Application preparation and submission to grants (e.g. OGs, HORIZON-EU, ...)</li> </ul>
		Project management
<b>ISS7. Institutional</b>	Provision of institutional support for niche innovation (incubators,	Negotiation with authorities to create 'protect' space for experiments
		Provision of incubators and experimental infrastructures

<b>support for niche innovation and scaling mechanisms stimulation</b>	experimental infrastructures etc.) and for scaling out and scaling up the innovation process. This refers to support for the design and enforcement of norms, rules, funding mechanisms, taxes, subsidies, etc. that facilitate the innovation process or the diffusion of innovation.	Support for the design and enforcement of norms, rules, funding mechanisms, etc. that facilitate the diffusion of innovation
		Brokerage along the production chain (ISS4)
		Exploitation strategy and action plan design and implementation
		Supporting intellectual property (patents) and patent authorization processes
		Negotiation with people affected by the innovation

Advisory, consultancy and backstopping (ISS 2) encompass on-demands services aimed at solving complex problems and co-construct solutions. They are characterised by the high content of soft skills and the ability of the advisor to 'handle' the production process, facilitating the connection with other services. The soft management of production processes, which entails communication, ability to listen and to value farmer's insights, combined with technical capacities and interactional expertise (Ingram, 2008), as well as the ability to collaborate with different kinds of actors and develop adequate practices (Nettle et al., 2017), also underpins the development of multi-actor project pathways.

The function 'networking, facilitation and intermediation' (ISS 4) is transversal and contributing to/facilitating the other functions and it is crucial in all phases of the innovation process. Networking, in particular, is a strategic function that takes up a large part of the efforts of ISS providers and is fundamental in triggering and finalising innovation pathways. As already pointed out by Faure et al., (2019), the function takes different forms depending on the phases, the number, the type and the capacities of the actors involved (Klerkx and Leeuwis, 2009a) and their needs.

The 'support to access to resources' (ISS 6) function plays an important role, especially with regard to access to financial resources, relations with funding bodies and project management, as well as the 'demand articulation' (ISS 3), which includes key activities to build a multi-actor process from the ground, starting from needs analysis, through to the development of a common vision and the creation of bridges with users and other actors to make the need concrete, defining its contents, specificities and costs.

The provision of 'services aimed at enhancing the capacities of actors' (ISS 5) does not seem to be a key function and its role is described as being minor compared to information and dissemination activities

Finally, 'support for niche innovation and the stimulation of scaling mechanisms' (ISS 7) is mainly offered as dialogue and intermediation activities at various levels, horizontal, supply chain, institutional and community levels. This function, which includes authorisation processes that are needed to introduce an innovation to the market (standards, intellectual property, patents, etc.), is crucial for the embedding of innovation. Faure et al., (2019) argue that there is no specific type of service provider that is solely responsible for this kind of service, but multiple actors (farmers' organizations, private firms, cooperatives, etc.) can perform the function, either coordinating or not. Proietti and Cristiano (2022) found that, in many cases, there is a lack of awareness of scaling mechanisms,

that are often confused with dissemination. On the other hand, the scaling function, meaning the shift from the first circle of users/co-innovators to a wider circle of user, entails iterative processes that extend beyond the lifetime of projects and, therefore, requires a dedicated budget and the capacities to interact with different systems at multiple levels (Annex 1). This is particularly true for support to the scaling-up or 'vertical development' (respect to the scaling-out or 'horizontal development, which happen when other groups develop the same innovations with the same methods): in fact, the achievement of a higher degree of diffusion of innovation at multiple levels can be hampered by resistance to change as well as by emergence of alternative / competing regimes and may require specific services and policy support (Brunori et al., 2011) (§ Annex 1).

## Competences

The variety of ISSs described in the literature is complemented by a wide description of competencies needed to carry out innovation support functions. In 2016, the GFRAS Consortium on Extension Education and Training finalised [The New Extensionist Learning Kit](#) (Sulaiman and Davis, 2012), a learning resource containing 13 modules that have been identified crucial core competencies for individual extension agents (Davis, 2015). The aim of the kit is to produce or equip an extension professional who can effectively interact and work with all the different actors within the agricultural innovation system with an ultimate aim of benefiting producers and related actor.

In literature, several definitions are used to define the term 'competency' or 'competence' (e.g., Cooper & Graham, 2001; Davis, 2015; Stone & Bieber, 1997). The European Qualifications Framework (EQF) as well as the European multilingual classification of Skills, Competences, Qualifications and Occupations (ESCO) refer to "competence as the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. They are described in terms of responsibility and autonomy" (European Commission - DG Employment Social Affairs and Inclusion, n.d.-a)

More in general, "Competency" has been defined as a skill, attitude, or behavior that enables an individual to do his/her job more effectively. A competency is, therefore, more than just knowledge and skills. It involves the ability to meet complex demands, by drawing on and mobilising psychosocial resources (including skills and attitudes) in a particular context. For example, the ability to communicate effectively is a competency that may draw on an individual's knowledge of language, practical IT

Similarly, the Competency development programmes for advisors and consultants in rural areas compiled under the umbrella of the IALB (International Academy of Rural Advisors), concluding with the CECRA (Certificate for European Consultants in Rural Areas) Certificate, offers 19 training modules focusing on:

- methodological competencies: organisation of advisory processes in their different stages, understanding of one's role and advisory models, project management, moderation skills, media technology, visualization, process guidance, monitoring of processes of change, problem solving skills, adult and education management,
- communication and social skills: ability to cooperate, work in a team, and network, conversational skills, ability to form relationships, information literacy, high-profile knowledge transfer, ability to accept criticism, capable to handle conflicts,
- personal competencies: analytical faculties, personal appearance, self-organization, work organisation, working techniques, goal-oriented working, willingness to learn and change, intercultural competence, innovative thinking and acting, recognition of abilities and limits, reference to other specialists, selfcare, self-reflection and reflection of work

As part of the i2Connect project ([D1.4](#)), a detailed analysis of the competencies that the innovation advisor should have, especially with respect to facilitation of interactive innovation, was carried out (Debruyne and Lybaert, 2020, further refined by Lybaert et al., 2022). Through a wide literature review (including recent projects findings, such as Agri Link), semi-structured interviews with experts and an online validation workshop, and following the structure 'Qualifications of an advisor' (Gerster-Bentaya et al., 2009), the authors identify five themes of competency profile, each of them consisting of a number of clusters, which in turn comprise several competencies:

- Basic Disposition and Attitude, which articulated in four clusters of competencies: (a) self-awareness, (b) personal drive, (c) sensitivity, and (d) reliability.
- Content Competence, articulated in three clusters, which are linked to understanding the specific (agricultural) context the innovation process is embedded in: (a) understanding the social context, (b) understanding the AKIS, and (c) content knowledge.

- Methodological Competence, which comprises four clusters related to the context of Interactive Innovation: (a) understanding the innovation process, (b) energy, (c) co-creation, and (d) mediation.
- Organisational Competence, which includes a single cluster under the same name. This cluster encompasses the practical network management skills and other skills like planning, organising meetings, following up with contacts, keeping track of the network, time management, resource management, writing a project proposal and the knowledge on how to collect funds, delegation skills, and basic digital skills which are essential for carrying out organisational tasks, as well as accessing new information.
- Reflection, Learning and Personal Development, articulated in four clusters: (a) reflection among peers, (b) self-reflection, (c) addressing professional network, and (d) lifelong learning.

Table 2, obtained by combining the above competencies with ISS functions, provides an overview of the skills needed to perform the various innovation support functions.

The competency framework developed by (Debruyne and Lybaert, 2020) lists a quite comprehensive skills, attitudes, and behaviors needed to provide innovation support services and describes what they look like in practice (look at Lybaert et al., 2022, for a complete description).

However, this framework does not suggest ways to train and support individual actors. Moreover, some competencies are still lacking, as exemplified in the last group of table 2 (e.g., competencies to facilitate the aggregation of partnerships and the scaling of innovations). This is mainly because i2connect project is mainly focus on managing the network during the innovation process and less on the upstream and downstream phases of it.

The core question that ATTRACTISS will face, once the list of competences is extended, is on which topics focus on and which CD methods use to improve all these “competences”.

**Table 2. First overview of the skills needed to provide innovation support functions**

Competences	ISS Functions						
	ISS1	ISS2	ISS3	ISS4	ISS5	ISS6	ISS7
<b>Basic Disposition and Attitude</b>							
Self-awareness (Self-awareness, Sense of equity, Willing to take a step back when needed, Willing to share power and give up control)					X		
Personal drive (Personal drive, Passion, Dedication, Trust in intuition)		X		X			
Sensitivity (Sensitivity, Responsiveness, Empathy, Emotional intelligence, Communication skills (=conversational skills, basics of communication, esteem, questioning techniques, active listening, etc.) + Social skills (=Ability to cooperate, work in a team, and networking)	X	X	X	X	X	X	X
Reliability (Reliability, Accountability, Trustworthiness, Ethics, Responsibility, Professional attitude)	X	X	X	X	X		X
<b>Content Competence</b>							
Understanding the social context (Understanding the broader social environment, Connecting to the community, Understanding own role in the system, Being able to identify relevant actors)		X	X			X	X
Understanding the Agricultural Knowledge and Innovation System (AKIS) (Understanding political and economic context, Basic knowledge about legal matters and the public policy of the region)		X	X				X
Content knowledge (Background in agriculture, Technical knowledge, Ability to understand English)	X	X	X		X		
<b>Methodological Competence</b>							
Understanding the innovation process (Sensitivity for the process, Being able to recognise patterns in an innovation process, Knowing how to act in any given situation, Possessing and using tools related to innovation processes, Problem solving skills)		X		X			X
Energy (Being able to keep energy and enthusiasm in the group, Being able to activate and mobilise people, Facilitation skills, Translation skills)		X	X	X			

Co-creation (Being able to identify crucial positions, Being able to identify missing positions, Good insight into human psychology)		X	X	X			
Mediation		X	X	X			X
<b>Organisational Competence</b>							
Organisational competence (Planning, Meeting organisation, Following up with contacts, Keeping track of the network, Time management, Managing resources, Writing project proposals, Collecting funds, Delegating, Digital skills)	X	X	X		X	X	X
<b>Reflection, Learning, and Personal Development</b>							
Reflection among peers (Habitually reflecting upon work with peers, Sharing a common language)		X			X		
Self-reflection (Habitually self-reflecting)		X			X		
Addressing professional network (Utilizing professional network)	X	X			X	X	
Lifelong learning aptitude (Ongoing skill development and learning, Knowing how to find new information)	X	X			X		
Knowing and using communication techniques	X		X	X	X		
Relationship building			X				X
Know and use methods for information gathering and analysis, as well as monitoring and evaluation			X	X			
Know and use educational methods and learning approaches					X		
Monitoring of processes of change		X		X			X

### 3.ATTRACTISS overall approach

The overall purpose of ATTRACTISS is to extend the scope of ISSs activities in MS and regions developing both capacities and sound innovation generation and support methods to enable individual grassroots innovative ideas to come to fruition, thus facilitating effective implementation of innovative policies within the framework of the Green Deal, the CAP, the Farm to Fork Strategy and the Biodiversity Strategy. This should allow Member States AKISs to be better advance knowledge, build capacities and co-create innovative solutions to accelerate the transition to a sustainable and circular management and use of natural resources.

To this aim ATTRACTISS intends to adopt a capacity-development approach that involves a plurality of actors, through a multi-year pathway of discovering, exploring, learning, reflecting, gradual reshaping and, eventually, successful transformation.

#### ***Capacity development***

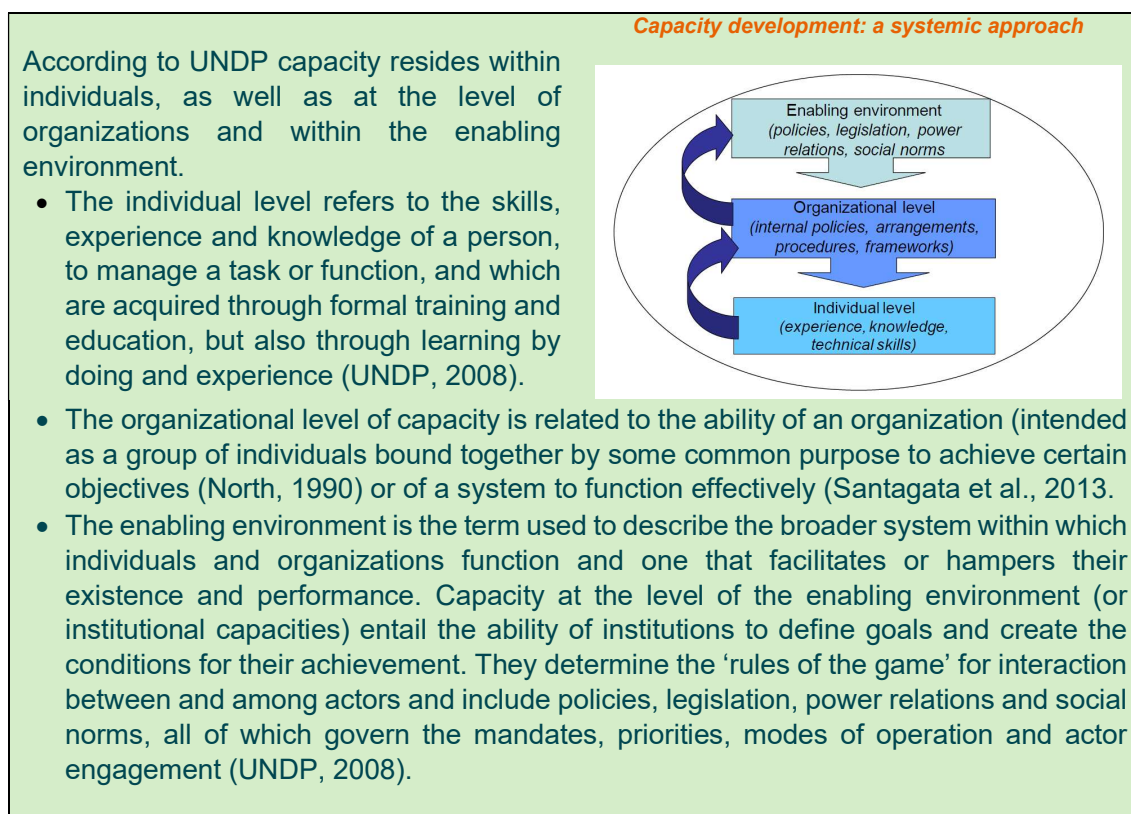
Capacity development (CD) is increasingly recognised as a multi-dimensional, multi-actor process (Ubels et al., 2011; Pearson 2011) that goes beyond the transfer of knowledge and skills at the individual level to include organisations, sectors, systems, and the enabling environment in which they all exist (Lucas, 2013)

"Capacity" has been defined as the ability of individuals, institutions and companies to implement functions, solve problems and set and achieve goals in a sustainable manner (UNDP, 2006). Capacity development (CD) is, therefore, 'the process through which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time' (UNDP, 2008).

Since the 2000s, this term has progressively replaced the notion of 'capacity building', that is commonly used to mean the strengthening of the capacity of individuals and institution, as a core concept of development policy. The reason for this progressive swift is because the concept of "capacity building" suggests building something new from scratch, according to a pre-set project and based on assumption that there are no existing capacities to start from (UNDP, 2008), while "capacity development" is believed to better express an approach that builds on existing capacity assets, driving a process of dynamic and flexible change, involving local actors (Zamfir, 2017).

According to this, ATTRACTISS' CD pathway starts from the engagement and aggregation of existing resources and competencies throughout EU MS and supports them, on the one hand, to dialogue with each other and with excellent experiences of knowledge co-production at the European level, and on the other hand, opening new ways of dialogue and involvement of national/local AKIS actors, including policy makers and silent actors, to enable the development of more inclusive innovation environments.

This pathway will allow to link individuals, as well as organizations and the enabling environment (fig. 1) to address, in addition to individual capacities, broad questions of institutional change, empowerment and participation.



The individual level of capacity represents a core element of ATTRACTISS that is going to increase ISSs' capacities and skills, using different methods and tools (Table 3 in Annex 2 presents an overview on methods and tools) to address the different starting ability and knowledge levels of key actors, as well as MSs' needs.



It is intended that the initial CD process is carried out over a six-month period each year and includes collegial coaching as well as targeted training modules designed to support trainees who enter the programme at different initial skill levels. This process will be designed in a participatory process with end-users, basing on their needs, and will give a follow up existing activities (and results achieved) in the i2connect project. Iterated cycles of need assessment, and feedback loops on the achievement of the objective (bridging the competency gap, changing the attitude, developing new skills etc.) are the basis for continuous re-design of the capacity-building pathway

At the organizational level, ATTRACTISS is going to support trained key actors to work with the ISS organizations to which they belong to focus on improving the identified key areas for supporting the provision of effective ISSs

Concerning the enabling environment, ATTRACTISS puts particular emphasis on support for effective increase in participation in innovative processes for actors currently not fully participating. They are farmers and their organisation and other actors, including research centres, having innovation capacity but due to the 'rules of the game' are not involved in innovation processes. Real support for these groups to facilitate their transition from position of "potential AKIS actors" into active participants is key to achieving the call objective of enabling the relevant actors to be actively involved in the co-creation process leading to the discovery of innovative ideas directly related to their needs. This also entails working with decision-making levels (Managing Authorities and policy makers) to improve governance models and delivery mechanisms in order to enable the inclusion of ISSs in the different regional contexts and a greater adoption of innovative processes.

ATTRACTISS pathway will be co-developed through an iterative design-application-learning-adjustment process applying multi-actor approach.

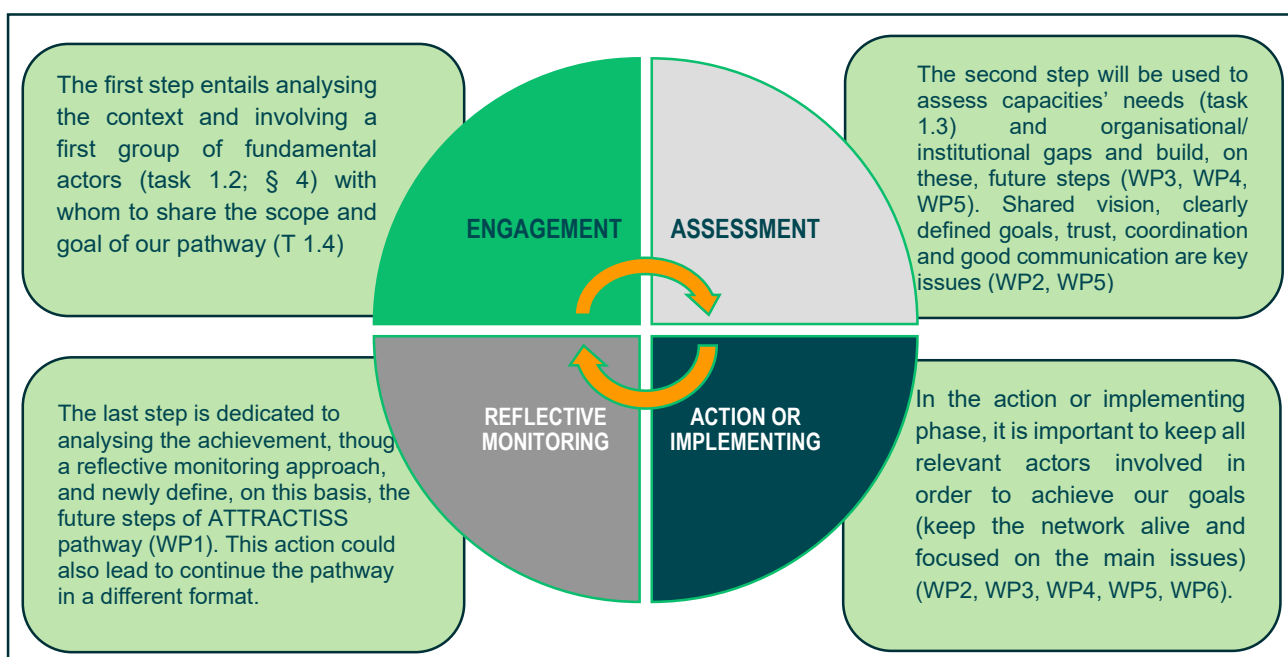
### ***Multi-actor approach***

Multi-actor approach (MAA) (§ Annex 1) is an important part of any capacity development intervention, since it allows building the combined as well as the individual, organizational and institutional capacities and may enhance the quality of interventions that influence their interrelationships through effective mobilization of actors at different levels (Rocchigiani and Herbel, 2013).

Practical experience has shown that effective capacities can exist only in the relationships between actors and grow through interaction rather than from training or organisational development. This is why working with multiple actors is considered an effective form of CD in its own right. By knowing each other and better understanding the bigger picture, actors start to jointly influence whole systems in positive ways and work together to negotiate improved conditions (Acquaye-Baddoo et al., 2010).

ATTRACTISS MAA will be applied all along the steps of the projects that are chronological (but can be revisited at any time if necessary) and repeated in iterative cycles: engagement, needs' assessment, action or implementing, reflective monitoring (fig. 2).

*Figure 1. Step model of ATTRACTISS multi-actor approach*



### *Multi-actor engagement*

The step of engaging actors sits at the beginning of the capacity development process, since ATTRACTISS aims at involving all relevant actors and secure their support, knowledge and practical experience, thereby making the process self-sustaining and internally driven.

Indeed, while engaging actors is depicted as the first step of the capacity development process, it is inherent in every step. It includes the mapping of key



actors to engage in the capacity development process (T1.2, WP2) and a discussion on development priorities (T1.4).

In ATTRACTISS, we prefer to use the term actor rather than stakeholder, since actors are intended to bring more to the table (knowledge, relational abilities, resources, etc.) than just its stake or interest.

### *Needs assessment*

Through the needs assessment we will collect data & information on desired and existing (individual, organisational and institutional) capacity. These data & information, which are gathered by a variety of means, including interviews and workshops (T1.3; T5.1), will inform the formulation of a capacity development response (empowerment pathway) (T1.4; WP3 & WP4; T5.2) tailored according to different expertise, contexts and role within the AKIS.

This step will help deepen participation and dialogue, around the capacity development process and facilitates consensus on results.

### *Action*

Action concerns the implementation of various CD activities. A range of capacity development tools will be used (§ Annex 2) with emphasis on those enabling:

- different actors to learn from each other, create synergies, build up networks and scale up successful pilot initiatives
- all actors to share their perspectives and ideas, with a focus on strengthening the voices of silent actors, so as to co-generate activities and results which are taking into account their challenges and needs
- provision of feedbacks on the on-going project activities and results and proposals for further developments
- immediate take-up and benefits for the plurality of potential end-users.

### *Reflexive monitoring*

Reflexive monitoring on the CD process is part of MAA and encourages actors to reflect on some key items; project ambitions, current activities and developments that allow opportunities for change and implementation of new solutions.

Reflexive monitoring refers to a suite of approaches, intended to enable continuous double loop learning in organizational contexts (Argyris & Schön, 1978). According to Beers & Van Mierlo (2017), the aim of using reflexive monitoring is the intent to provide actors with relevant information and evidence

that allows them to collaboratively (re-)formulate ATTRACTISS goals and CD pathways.

Since the goal of reflexive monitoring is to facilitate action-oriented learning, the initial formulation of reflexive monitoring methods and approaches (Van Mierlo, 2010) will be co-designed with key actors, to ensure relevance and immediacy.

## 4. Criteria for mapping ISSs and collect practical cases within multi-actor projects

ATTRACTISS aims at generating new knowledge about the variety of actors who are providing ISSs in the MSs, both at local and system levels, the functions that they are performing, their organisational models and the AKIS environment (and governance models) in which they operate. To this aim, project partners and the ISSs network will be iteratively engaged in mapping of actors and practical cases (Task 1.2). This will be constantly updated to allow actors to be progressively engaged by ATTRACTISS, to monitor the (hopefully) growth of ISS providers and to identify new practical cases to learn from.

### Criteria for mapping ISSs

The mapping of the ISS providers will be carried out three times during the project's lifetime and presented in Deliverable 1.2. First ISS mapping will be carried out by month 5.

Several studies show the presence of a multiplicity of actors providing innovation support services, who may also be engaged in the same innovation project by delivering different support functions (Faure et al. 2019; Proietti and Cristiano 2022), and who may operate either through a specific mandate or out of professional and/or personal interest (Knierim et al., 2017; Proietti and Cristiano 2022) (§ 2.1). This raises more than one question about the criteria to be used for mapping ISSs. In this regard, the consortium has decided to adopt inclusive criteria that will allow, at least in this first phase, to map and include in the network all actors who, with different titles and degrees, carry out (support) activities to push the innovation process forward. This will allow the project to have a wide variety of cases to study in order to gain an in-depth understanding of the motivations and facilitating factors for carrying out innovation support services, as well as to analyze the roles, functions, methods and tools used by different actors in different contexts and at different stages of the innovation process. The analysis will also enable us to identify additional or different criteria for the mappings to be conducted in the following years.

Based on current knowledge (§ 2.1), the first mapping of innovation service providers is based on two main criteria:

- the provider already delivers some kind of innovation support service according to the 7 ISS functions.
- the provider has been appointed as an innovation support provider in the Member State or region based on the CAP Strategic Plan.

Due to the wide range of criteria, this first mapping also includes actors carrying out other core activities, e.g. research institutes. The ATTRACTISS studies will allow, in the future, to fine-tune the selection criteria and define the innovation support services, leading to possible adjustments in the mapping.

The mapping includes the collection of additional information that characterize the type of provider. Additional information encompasses the provider's characteristics, as well as its service. The first ones include: (1) institution or individual; (2) type of entity; (3) mandate for service; (4) working level; (5) sector; (6) connection with EIP OGs. The characteristics of the service concern (1) frequency of service delivery; and (2) classification of functions.

The first mapping is conducted following three approaches:

- 'Snowballing': starting with the initial list of partners, to which some key actors were added for countries that are not included in the ATTRACTISS consortium (which were identified within the ModernAKIS partnership – table below), each one will be asked to propose the ISS providers that they know, continuing in a rapidly expanding manner. As new actors are added, multiple iterations of snowballing with several different starting points will be repeated thus to reduce identification bias.
- Gathering existing information from the EIP-Agri database: the database already includes 1073 registered innovation supporters whose name, email address and project(s) are available. This is already a map which, in agreement with the EIP-Agri Support Facility, can be implemented with additional information to be collected through a survey. Moreover, the EIP Support Facility has a specific brochure concerning the ISS providers in the Member States, which provides a better overview and intense interpretation of the topic with two concrete examples: Soil Association and Innovative Steunpunt.
- Gathering existing information from the i2connect database: the database includes registered advisors. Those performing innovation support functions can be extrapolated and surveyed to gain additional information.

## **Criteria for collecting practical cases within multi-actor projects**

According to the current state of the art and already in place experience, this section provides some criteria that will necessarily must be considered in defining a methodology for selecting and analysing practical cases across Europe showing how ISSs effectively support individuals or groups involved in interactive innovation processes. These activity will be implemented in task 4.2 with the aim of allowing actors engaged in the ATTRACTISS CD to analyse innovation support practices first-hand, with the double purpose of investigating and learning from the way how innovation processes has been supported by others.

These criteria are largely based on the field peer review methodology (and related outcomes) developed by the i2connect project, which in turn is grounded on similar tools from H2020 projects, such as AGRISPIN and LIAISON, the FAO Innovation Capacities Scoring Tool (Proietti et al., 2021), the ISS functions (Faure et al., 2019), as well as on the Innovation Journey (Van de Ven et al. al., 1999) and the Spiral of Innovation (Wielinga et al. 2008) concepts.

Practical cases to be deepen should meet a few basic requirements:

- involvement of a plurality of actors
- a clear end-users need to be addressed
- ensuring co-decision-making precesses
- enabling potential end-users to provide feedbacks on on-going project activities and to propose further developments
- using of tools and methods enabling peer-to-peer discussion, system thinking, as well as collective learning
- ensuring immediate up-take and benefits for potential users

Furthermore, the case must provide clear evidence of the mobilisation of actors in support of the following steps of the innovation process:

- carrying out an initial needs/opportunities analysis
- organizing initial contacts for sharing the initial idea, and facilitating the definition of the project scope (most inspired/promising solution)
- key actors' identification and aggregation
- finalization of the idea, vision development (alignment of expectations between actors) and objectives setting

- identification and securing of funding sources, mediating the relation with the granters
- negotiation with authorities to create 'protect' space for experiments
- (securing) provision of experimental infrastructures
- fostering interest and involvement of key actors during the innovation process
- creation and maintenance of trust among partners, conflict resolution
- facilitation of co-decision-making processes and of a cooperative approach towards the realization of objectives
- facilitation of collective learning, knowledge exchange, joint reflection and feedback processes
- organizing interlocution with actors (outside the partnership, e.g., along the supply chain) relevant to innovation, negotiating and making agreements
- monitoring progress toward the achievement of objectives
- sharing of relevant information with actors outside the partnership, identification of target groups and activation of communication tools/channels
- involvement of key actors in dissemination activities, mobilization of multiplier actors in the supply chain
- facilitating connections with other programs or strategies
- facilitating the exploitation of project results and the (eventual) design and enforcement of norms, rules, funding mechanisms, etc. that facilitate the diffusion of innovation
- intermediation between consumers and producers, among actors along the production chain, or between project partners and institutional actors
- supporting intellectual property (patents) and patent authorization processes.

These criteria, which are not exhaustive, provide a framework for the development of a methodology for gathering data on practical cases and their further evaluation, which will be developed as part of Task 4.2.

## References

- Aarts N., Van Woerkum C. & Vermunt B. (2007) Policy and planning in the dutch countryside: The role of regional innovation networks, *Journal of Environmental Planning and Management*, 50:6, 727-744, DOI: 10.1080/09640560701608473
- Albert H., 2000. *Agricultural Service Systems: A Framework for Orientation*, Eschborn, GTZ.
- Acquaye-Baddoo N-A, Ekong J., Mwesige D., Nass L., Neefjes R., Ubels J., Visser P., Wangdi K., Were T., Brouwers J., 2010. Multi-actor systems as entry points to capacity development. *Capacity.Org journal* No. 41
- Allebone-Webb, S., B. Douthwaite, E. Hoffecker, S. Mathé and B. Triomphe. 2016. What is capacity to innovate and how can it be assessed? A review of the literature. IFSA Conference. New Port, GB, 25.
- Assefa, A., Waters-Bayer, A., Fincham, R., & Mudahara, M. (2009). Comparison of frameworks for studying grassroots innovation: Agricultural Innovation Systems (AIS) and Agricultural Knowledge and Information Systems (AKIS). In P. Sanginga, A. Waters-Bayer, S. Kaaria, J. Njuki, & C. Wettasinha (Eds.), *Innovation Africa: Enriching farmers livelihoods* (pp. 35–56). London: Earthscan.
- Auvine, B, B. Densmore, M. Extrom, S. Poole and M. Shanklin. (2002). What do we mean by facilitation. *Group Facilitation: A Research & Applications Journal* 4: 53-55.
- Barbier M. and Elzen B. (eds), 2012. *System Innovations, Knowledge Regimes, and Design*
- Beers P. J, A.J. Sol, A. E. J. Wals. 2010. "Social learning in a multi-actor innovation context". Paper presented at 9<sup>th</sup> European IFSA Symposium, 4-7 July 2010, Vienna (Austria)
- Beers P. J., Geerling-Eiff F., 2014. Networks as Policy Instruments for Innovation, *Agricultural Extension and Education*, 20(4), 363-379.
- Birner R., Davis K., Pender J., Nkonya E., Anandajayasekaram P., Ekboir J., Mbabu A., Spielman D., Horna D., Benin S., Cohen M., 2009. From best practice to best fit. A framework for analysing pluralistic agricultural advisory services worldwide. *J. Agric Educ. Ext.* 15 (4), 341e355.
- Brunori G., Berti G., Klerkx L., Tisenkopfs T., Roep D., Moschitz H., Home R., Barjolle D., Curry N., 2011. Learning and innovation networks for

sustainable agriculture: a conceptual framework. Deliverable 2.1 SOLINSA project

- Cristiano S. and P. Proietti. 2014. "Acting as Agricultural Innovation brokerage in Italy: experiences from the Rural Development Programmes 2007-2013". In *Farming Systems Facing Global Challenges: Capacities and Strategies*. Volume 1. – Proceedings of the 11th European IFSA Symposium, p. 803-812, ISBN 9783981395754.
- Cristóvão, A., A. Koutsouris, M. Kügler. 2012. Extension systems and change facilitation for agricultural and rural development. In Darnhofer, I., D. Gibbon, B. Dedieu, *Farming Systems Research into the 21st Century: The New Dynamic*. Springer Editors
- M. Crossan, M. Apaydin, 2010. A multi-dimensional framework of organizational innovation: a systematic review of the literature. *Journal Managing Studies*, 47, [10.1111/j.1467-6486.2009.00880.x](https://doi.org/10.1111/j.1467-6486.2009.00880.x)
- Davis K., 2015. *The New Extensionist: Core Competencies for Individuals*. GFRAS Brief #3, Global Forum for Rural Advisory Services: Lindau, Switzerland <https://www.g-fras.org/en/activities/the-new-extensionist.html#publications>
- Debruyne L and Lybaert C., 2020. Repository of required competencies of an innovation advisor. Deliverable 1.4 i2connect project, <https://i2connect-h2020.eu/resources/communication-materials/reports-and-project-outputs/>
- Dockès, A. C., Tisenkopfs, T., & Bock, B. (2011). Collaborative working group agricultural knowledge and innovation systems . WP1: Reflection paper on AKIS. Sub-deliverable of the AKIS CWG – WP1 – April 2011. Brussels: European Commission.
- Eip – Agri (2014), *Eip Operational Groups – Turning your idea into innovation*, fact sheet [\[link\]](#)
- Elzen, B., B. van Mierlo, C. Leeuwis. 2012. "Anchoring of innovations: assessing Dutch efforts to harvest energy from glasshouses". *Environment Innovation and Social Transitions* 5, 1–18.
- Elzen B., Geels F.W. and Green K. (Eds.), 2004. *System Innovation and the Transition*
- European Commission (2014), *Draft guidance document. "Co-operation" measure. Article 35 of Regulation (EU) No 1305/2013 (version: May 2014)*, Brussels, Belgium

- European Commission (2017). Horizon 2020, Work Programme 2016 - 2017.  
[https://ec.europa.eu/research/participants/data/ref/h2020/wp/2016\\_2017/main/h2020-wp1617-food\\_en.pdf](https://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-food_en.pdf)
- EU SCAR. 2012. Agricultural knowledge and innovation systems in transition – A reflection paper. Brussels: European Commission.
- EU SCAR AKIS. 2019. *Preparing for Future AKIS in Europe*. Brussels, European Commission.
- Faure G., A. Knierim, A. Koutsouris, T. Ndah, S. Audouin, E. Zarokosta, E. Wielinga, B. Triomphe, S. Mathé, L. Temple, K. Heanue. 2019. “How to Strengthen Innovation Support Services in Agriculture with Regard to Multi-Stakeholder Approaches”, *Journal of Innovation Economics & Management*, 2019/1 (n° 28), p. 145-169. DOI: 10.3917/jie.028.0145. URL: <https://www.cairn.info/revue-journal-of-innovation-economics-2019-1-page-145.htm>
- Faure G., Davis K., Ragasa C., Franzel S., Babu S. C., 2016. Framework to assess performance and impacts of pluralistic agricultural extension systems. The best-fit framework revisited Washington DC: IFPRI-CIRAD
- Fieldsend, A., E. Cronin., E. Varga, S. Biró, E. Rogge. 2021. “Sharing the space in the agricultural knowledge and innovation system: multi-actor innovation partnerships with farmers and foresters in Europe”. *The Journal of Agricultural Education and Extension* 27 (4): 423-442 <https://doi.org/10.1080/1389224X.2021.1873156>
- Gadrey J., 1994. Les relations de service dans le secteur marchand, in Bandt J., Gadrey J. (eds), *Relations de service, marchés de services*, Paris, CNRS Editions.
- Geels, F. (2002) Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case study, *Research Policy*, 31, 1257–1274
- Geels F.W., 2005. *Technological transitions and system innovations: A coevolutionary and socio-technical analysis*, Cheltenham: Edward Elgar.
- Geels, F. and Schot, J. (2007) Typology of sociotechnical transition pathways, *Research Policy*, 3, 36, 399-417
- Gerster-Bentaya M., Hoffmann V., Christinck A., Lemma M., 2009. *Rural Extension Vol. 3: Training Concepts and Tools*; Margraf Publishers GmbH: Weikersheim, Germany; ISBN 9783823615736

- Godin B., 2006. The linear model of innovation: the historical construction of an analytical framework. *Science, Technology, & Human Values*, 31, pp. 639-667, [10.1177/0162243906291865](https://doi.org/10.1177/0162243906291865)
- Habermas, J. (1984). *The Theory of Communicative Action: Reason and the Rationalization of Society*. Cambridge: Polity Press.
- Hall, A., Janssen, W., Pehu, E., & Rajalahti, R. (2006). *Enhancing agricultural innovation: How to go beyond the strengthening of research systems*. Washington, DC: World Bank.
- Hearne D. & Wolferts D., 2021. Multi Actor Approach Framework. DEMETER Project, Horizon 2020 GA 857202, <https://h2020-demeter.eu/about-demeter/>
- Heemskerk W., L. Klerkx, J. Sitima, 2011. Brokering Innovation, in Nederlof, S., M. Wongtschowski, F. van der Lee (eds), *Putting Heads Together: Agricultural Innovation Platforms in Practice*, Amsterdam, KIT Publishers, 43-54.
- Hermans, F., L. Klerkx, & D. Roep, 2012. Structural conditions for dynamic innovation networks: a review of eight. *Proceedings IFSA 2012: Producing and reproducing farming systems*, The 10th European IFSA Symposium, Aarhus, Denmark, 1-4 July 2012. - Aarhus, Denmark: IFSA, 2012, 1 - 11.
- Hodson, M., Marvin, S., Bulkeley, H., 2013. The intermediary organisation of low carbon cities: a comparative analysis of transitions in Greater London and Greater Manchester. *Urban Stud.* 50 (7), 1403–1422. 35, 715–728.
- Howells, J. 2006. “Intermediation and the role of intermediaries in innovation”. *Research Policy* 35: 715-728
- Ingram, J., P. Gaskell, J. Mills, and J. Dwyer. 2020. “How Do We Enact Co-innovation with Stakeholders in Agricultural Research Projects? Managing the Complex Interplay Between Contextual and Facilitation Processes.” *Journal of Rural Studies* 78: 65–77. doi:10.1016/j.jrurstud.2020.06.003.
- Ingram J., 2008. Agronomist-farmer knowledge encounters: an analysis of knowledge exchange in the context of best management practices in England. *Agriculture and Human Values*, 25(3), 405-418.
- Kemp, R., 1994. Technology and the transition to environmental sustainability. The problem of technological regime shifts. *Futures*, 26, 1023–1046

- Kilelu, C. W., L. Klerkx, C. Leeuwis, 2013. How Dynamics of Learning are Linked to Innovation Support Services: Insights from a Smallholder Commercialization Project in Kenya, *Agricultural Education and Extension*, 20(2), 213-232.
- Kivimaa, P., W. Boon, S. Hyysalo, L. Klerkx. 2018. "Towards a typology of intermediaries in sustainability transitions: A systematic review and a research agenda". *Research Policy*, <https://doi.org/10.1016/j.respol.2018.10.006>
- Klerkx L., Jansen J., 2010. Building Knowledge Systems for Sustainable Agriculture: Supporting Private Advisors to Adequately Address Sustainable Farm Management in Regular Service Contacts, *Agricultural Sustainability*, 8(3), 148-163.
- Klerkx, L., C. Leeuwis. 2009a. "Establishment and embedding of innovation brokers at different innovation system levels: Insights from the Dutch agricultural sector". *Technological Forecasting & Social Change* 76 (2009) 849–860
- Klerkx L., Leeuwis C. (2009b) *Shaping collective functions in privatized agricultural knowledge and information systems: the positioning and embedding of a network broker in the dutch dairy sector*, in «The Journal of Agricultural Education and Extension», 15(1), pp. 81-105.
- Klerkx L., N. Aarts, C. Leeuwis, 2020. Adaptive management in agricultural innovation systems: the interactions between innovation networks and their environment. *Agricultural System*, 103 (2010), pp. 390-400, [10.1016/j.agry.2010.03.012](https://doi.org/10.1016/j.agry.2010.03.012)
- Klerkx, L., Van Mierlo, B., & Leeuwis, C. (2012). Evolution of systems approaches to agricultural innovation: concepts, analysis and interventions. In I. Darnhofer, D. Gibbon, & B. Dedieu. *Farming systems Research into the 21st Century: The new dynamic*. Dordrecht: Springer Science.
- Knickel, K., Brunori, G., Rand, S., & Proost, J. (2009). Towards a better conceptual framework for innovation processes in agricultural and rural development: from linear models to systemic approaches. *Journal of Agricultural Education and Extension* 15(2).
- Knierim A., Gerster-Bentaya M., Birke F., Bae S., Kelly T., 2020. Innovation advisors for interactive innovation process: Conceptual grounds and common understandings. Deliverable 1.1 i2Connect project

- Knierim, A., P. Labarthe, C. Laurent, K. Prager, J. Kania, L. Madureira, H.T. Ndah. 2017 “Pluralism of agricultural advisory service providers – Facts and insights from Europe”. *Journal of Rural Studies* 55 :45-58. doi: <https://doi.org/10.1016/j.jrurstud.2017.07.018>.
- Koutsouris A., 2018. "Role of Extension in Agricultural Technology Transfer: A Critical Review," Innovation, Technology, and Knowledge Management, in: Nicholas Kalaitzandonakes & Elias G. Carayannis & Evangelos Grigoroudis & Stelios Rozakis (ed.), From Agriscience to Agribusiness, pages 337-359, Springer.
- Koutsouris, A. 2014. “Exploring the emerging intermediation roles (facilitation and brokerage) in agricultural extension education.” *International Journal of Agricultural Extension*, Special Issue: International Conference – Emerging Horizons of Agricultural Extension for Sustainable Rural Development, February: 21-37.
- Koutsouris, A. (2008). Innovating towards sustainable agriculture: A Greek case study. *The Journal of Agricultural Education & Extension*, 14: 203-215.
- A. Koutsouris A.,, E. Zarokosta E., 2020. Supporting bottom-up innovative initiatives throughout the spiral of innovations: lessons from rural Greece. *Journal of Rural Studies*, 73 (2020), pp. 176-185, [10.1016/j.jrurstud.2019.10.046](https://doi.org/10.1016/j.jrurstud.2019.10.046)
- Labarthe, P., M. Caggiano, C. Laurent, G. Faure, and M. Cerf. 2013. *Concepts and Theories to Describe the Functioning and Dynamics of Agricultural Advisory Services*. Deliverable WP.2.1 of the PRO AKIS project, INRA, Paris.
- Leeuwis, C. (2004). *Communication for rural innovation: rethinking agricultural extension*. Blackwell Science, Oxford
- Leeuwis, C., and A. Van den Ban, 2004. *Communication for innovation: rethinking agricultural extension*, Third edition. Oxford, Blackwell Publishing.
- Leeuwis, C., and N. Arts. 2011. “Rethinking Communication in Innovation Processes: Creating Space for Change in Complex Systems.” *The Journal of Agricultural Education and Extension* 17 (1):21-36.
- Lucas, B. (2013). *Current thinking on capacity development*. GSDRC Helpdesk Research Report no. 960. Birmingham, UK: GSDRC, University of Birmingham.



- Lybaert C., Debruyne L., Kyndt E., Marchand F., 2022. Competencies for Agricultural Advisors in Innovation Support. *Sustainability*, 14, 182. <https://doi.org/10.3390/su14010182>
- Mathé S., G. Faure, A. Knierim, A. Koutsouris, H.T. Ndah, L. Temple, B. Triomphe, E. Wielinga, E. Zarokosta. 2016. *Typology of innovation support services*, WP1 AgriSpin, deliverable 1.4. CIRAD, Montpellier, France.
- Miller R., 2013. Changing the conditions of change by learning to use the future differently. In: *World Social Science Report*, Paris: International Social Science Council. DOI: <https://doi.org/10.1787/9789264203419-14-en>
- Moschitz, H., D. Roep, G. Brunori, T. Tisenkopfs. 2015. "Learning and Innovation Networks for Sustainable Agriculture: Processes of Co-evolution, Joint Reflection and Facilitation". *The Journal of Agricultural Education and Extension* 21 (1), pp. 1–11. DOI: 10.1080/1389224X.2014.991111.
- Moss, T., 2009. Intermediaries and the governance of sociotechnical networks in transition. *Environ. Plann. A* 41, 1480–1495.
- Murray, P. and D. Blackman. 2006. Managing innovation through social architecture, learning, and competencies: A new conceptual approach. *Knowledge and Process Management*, 13: 132–143.
- Nettle, R., L. Klerkx, G. Faure, and A. Koutsouris. 2017. "Governance Dynamics and the Quest for Coordination in Pluralistic Agricultural Advisory Systems." *The Journal of Agricultural Education and Extension* 23 (3): 189–195.
- Organisation for Economic Co-operation and Development (OECD), 2005. Definition and selection of key competencies: executive summary. OECD, Paris, <http://www.oecd.org/dataoecd/47/61/35070367.pdf>
- Pearson, J. (2011a) *Training and Beyond: Seeking Better Practices for Capacity Development*, OECD Development Co-operation Working Papers, No. 1, Organisation for Economic Co-operation and Development. <http://dx.doi.org/10.1787/5kgf1nsnj8tf-en>
- Pereira, L., Sitas, N., Ravera, F., Jimenez-Aceituno, A. and Merrie, A., 2019. Building capacities for transformative change towards sustainability: imagination in intergovernmental science-policy scenario processes. *Elementa: Science of the Anthropocene*, 7.

- Perez, S.A., L. Klerkx, C. Leeuwis. 2010. Innovation brokers and their roles in value chain-network innovation: preliminary findings and a research agenda. ISDA 2010, Montpellier, France
- Proietti P. and Cristiano S., 2022. "Innovation support services: an evidence-based exploration of their strategic roles in the Italian AKIS", *The Journal of Agricultural Education and Extension*, DOI: 10.1080/1389224X.2022.2069828
- Proietti P., Cristiano S., Boitelet M., Bänninger A., Papocsi L., Gorše Janežič M., Kavanagh J., Lakner D., 2021. First series of individual reports from the field reviews of practical cases. Deliverable 2.3 i2connect project. [https://i2connect-h2020.eu/wp-content/uploads/2021/10/i2connect\\_Deliverable\\_2\\_3\\_final.pdf](https://i2connect-h2020.eu/wp-content/uploads/2021/10/i2connect_Deliverable_2_3_final.pdf)
- Rocchigiani M. and Herbel D., 2013. Organization analysis and development. FAO, Rome
- Röling N. (1990) *The agricultural research-technology transfer interface: a knowledge systems perspective*, in Kaimowitz D., a cura di, Making the Link: Agricultural Research and Technology Transfer in Developing Countries, Boulder, Westview Press
- Röling N. G., Engel P. G. H. (1991) *IT from a knowledge system perspective: concepts and issues*, Paper presentato all'European Seminar on Knowledge Management and Information Technology, Wageningen.
- Salerno M.S, de Vasconcelos Gomes L.A. , da Silva D.O. , Bagno R.B., Uchôa Freitas S.L.T., 2015. Innovation processes: which process for which project? *Technovation*, 35 (2015), pp. 59-70, [10.1016/j.technovation.2014.07.012](https://doi.org/10.1016/j.technovation.2014.07.012)
- Santagata W., 2013. *Capacity Building e Empowerment*. In Santagata W. et al., "Rapporto internazionale sulle strategie di Capacity Building per la valorizzazione del patrimonio culturale. Il Piemonte come caso emblematico". CSS – EBLA, Centro Studi Silvia Santagata
- Savage, G. and C. Hilton, (2001). A critical view of facilitating labor-management collaboration. *Group Facilitation: A Research & Applications Journal* 3: 47-55.
- Smits R. and S. Kuhlmann. 2004. The rise of systemic instruments in innovation policy. *International Journal of Foresight and Innovation Policy* 1: 4-30
- Smits, R.E., S. Kuhlmann and P. Shapira (2010), "The Theory and Practice of Innovation Policy – An International Research Handbook", Edgar Elgar.



- Spielman, D., Ekboir, J., & Davis, K. (2009). The art and science of innovation systems inquiry: Applications to sub-Saharan African agriculture. *Technology in Society*, 31, 399–405.
- Steyaert, P., M. Barbier, M. Cerf, A. Levain, A., A. Loconto. 2017. “Role of intermediation in the management of complex socio-technical transitions”. In Elzen, B., A. Augustyn, M. Barbier and B. van Mierlo. 2017. *AgroEcological Transitions: Changes and Breakthroughs in the Making*. DOI: <http://dx.doi.org/10.18174/407609>
- Sulaiman R. and Davis, K. 2012. The “New Extensionist”: Roles, Strategies, and Capacities to Strengthen Extension and Advisory Services; Global Forum for Rural Advisory Services: Lindau, Switzerland.
- Sutherland L.A. and Labarthe P., 2022. Introducing ‘microAKIS’: a farmer-centric approach to understanding the contribution of advice to agricultural innovation, *The Journal of Agricultural Education and Extension*, 28:5, 525-547, DOI: 10.1080/1389224X.2022.2121903
- Tisenkopfs, T., I. Kunda, S. Šūmane, G. Brunori, L. Klerkx, H. Moschitz. 2015. “Learning and innovation in agriculture and rural development: the use of the concepts of boundary work and boundary objects”. *Journal of Agricultural Education and Extension* 21, 13–33.
- Ubels, J., Bokhoven, J., and Acquaye-Baddoo, N-A, 2011. Getting Capacity Development right, *The Broker*, <http://www.thebrokeronline.eu/Blogs/Capacity-on-the-brink-of-maturity/Getting-capacitydevelopment-right>
- UNDP 2008 *Capacity development: a practice note*, New York, United Nations Development Programme
- Van de Ven, A.H., Polley, D., Garud, R., & Venkataraman, S. (1999). *The innovation journey*. New York: Oxford University Press.
- Van Lente, H., Hekkert, M., Smits, R., van Waveren, B., 2003. Roles of systemic intermediaries in transition processes. *Int. J. Innov. Manag.* 7, 247–279.
- Vilas-Boas J., Klerkx L., Lie R., 2022. Connecting science, policy, and practice in agri-food system transformation: The role of boundary infrastructures in the evolution of Brazilian pig production, *Journal of Rural Studies*, Volume 89, p. 171-185,
- <https://doi.org/10.1016/j.jrurstud.2021.11.025>.
- Wielinga, H.E., B.W. Zaalink, R.H.M. Bergevoet, F.A. Geerling-Eiff, H. Holster, L. Hoogerwerf, M. Vrolijk. 2008. *Networks with free actors*:



*encouraging sustainable innovations in animal husbandry by using the FAN approach.* Wageningen University and Research.

- Wielinga E. and Robijn S. (2020) Energising networks. Tools for co-creation. Wageningen Academic Publishers
- Wielinga, E., Koutsouris, A., Knierim, A., & Guichaoua, A. (2017). Generating space for innovations in agriculture: the AgriSpin project. *Studies in Agricultural Economics*, 119(1), 26–33.  
<https://doi.org/10.7896/j.1043>
- World Bank (2012). Agricultural innovation systems: an investment sourcebook: Main report. Agricultural and rural development (ARD) case study.  
<http://documents.worldbank.org/curated/en/140741468336047588/Main-report>
- Zamfir I., 2017. Understanding capacity-building/ capacity development: A core concept of development policy. EPRS | European Parliamentary Research Service  
[https://www.europarl.europa.eu/RegData/etudes/BRIE/2017/599411/EP\\_RS\\_BRI\(2017\)599411\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2017/599411/EP_RS_BRI(2017)599411_EN.pdf)
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## Annexes

# Annex 1. Main concepts related to ATTRACTISS

## Understanding innovation

### Interactive innovation

Interactive innovation is a theoretical model or approach to innovation emphasizing the central role of cooperation among various actors, the sharing of knowledge and effective intermediation between actors along the value chains and at different territorial levels (Knierim et al., 2020; Röling, 1990; Röling and Engel, 1991; Klerkx and Leeuwis, 2009b; EU SCAR, 2012).

This model mainly relies on the concept of systems of innovation (Röling, 1990; Röling & Engel, 1991; Leeuwis & Ban, 2004; Hall et al., 2006; Klerkx et al., 2010; Dockès et al., 2011; EU SCAR, 2012). In the systems model, innovation is considered the result of a process of networking and interactive learning among a heterogeneous set of actors (farmers, input industries, processors, traders, researchers, extensionists, government official, and civil society organizations) (Leeuwis, 2004; Hall et al., 2006; Röling, 2009). This concept emphasizes that agricultural innovation is not just about new technologies but also about institutional and social change and requires alternative ways of organizing (Leeuwis, 2004; Spielman et al., 2009).

In the interactive approach, innovation is the results of a variety of dynamics (networking, joint (or social) learning, negotiation, mobilisation of resources) in which knowledge can flow from different sources and may emerge outside the formal learning world (Klerkx et al., 2012; Assefa et al., 2009) in a bottom-up process (e.g., Aarts et al., 2007; Knickel et al., 2009).

The interactive innovation model is implemented through the "multi-actor approach" (MAA) (Hearne and Wolferts, 2021).

## Systems of innovation

The dynamics of innovation systems have been conceptualised mainly through the Agricultural Knowledge and Innovation System (AKIS) and Agricultural Innovation System (AIS) approaches.

The World Bank (2012) defines the two frameworks as follows:

- **Agricultural Knowledge and Information System (AKIS)** indicates a system that links people and institutions to promote mutual learning and generate, share, and utilize agriculture related technology, knowledge, and information. The system integrates farmers, agricultural educators, researchers, and extensionists to harness knowledge and information from various sources for improved livelihoods. Farmers are at the heart of this knowledge triangle. This concept originates from the formulation of Agricultural Knowledge and Information Systems (AKIS) used by Röling in 1990 to describe “a set of agricultural organizations and/or persons, and the links and interactions between them, engaged in the generation, transformation, transmission, storage, retrieval, integration, diffusion and utilization of knowledge and information, with the purpose of working synergistically to support decision making, problem solving and innovation in agriculture”. In early 2000s, the “I as information” was shifted into “I as Innovation” to encompass a “systems of innovation view” (Smits et al., 2010)
- **Agricultural innovation system (AIS)** indicates a network of organizations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect the way different agents interact, share, access, exchange and use knowledge’.

We do not enter the scientific debate concerning the similarities and differences between the two concepts, for which please refer to Labarthe, Caggiano, Laurent, Faure, & Ceft 2013 and Klerkx, Van Mierlo and Leeuwis 2012.

Within the CAP, the term Agricultural Knowledge and Innovation Systems (AKIS) is used to describe the whole knowledge exchange system: the ways people and organisations interact within a country or a region. AKIS can include farming practice, businesses, authorities, research, etc. and can vary a lot, depending on the country or sector.

Article 3(9) of the Regulation (EU) No 2021/2115 defines the AKIS as “the combined organisation and knowledge flows between individuals, organisations,

and institutions who use and produce knowledge for agriculture and interrelated fields”

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Article 3(9) of the Regulation (EU) No 2021/2115 defines the AKIS as “the combined organisation and knowledge flows between individuals, organisations, and institutions who use and produce knowledge for agriculture and interrelated fields”

This definition shifts the focus on the plurality of sources of knowledge and on interaction between different actors in the innovation process. This takes advantage of the respective codified (researchers/academics) and tacit (practitioners) knowledge to develop new knowledge and innovation on a continuous basis, through emphasizing the need to foster feedback linkages among the wider range of actors and to generate mutual learning, sharing, and use of new technologies, knowledge, and innovation. Concepts and paradigms at the basis of AKIS are system thinking, lifelong learning, non-linear and interactive models, multi-actor and network driven innovations.

## **Innovation process**

The innovation process involves the use, application and transformation of knowledge in the solution of practical problems ().

For a long time thinking about innovation has been guided by a linear model, by which the development of innovation was assumed to follow a well-defined time sequence which began with new knowledge deriving from basic and applied research activities, implemented by the production process and, once marketed, diffused to other enterprises by imitation or by knowledge transfer initiatives. The linear innovation process is generally described as a three-phased innovation process (initiation, development and dissemination; see Godin, 2006; Crossan and Apaydin, 2010; Salerno et al., 2015), that follow an in step-by-step planning to reach largely predetermined results (Koutsouris and Zarokosta, 2020).

On the opposite side, interactive approach to innovation emphasises the central role of feedback effects between the downstream and upstream phases of

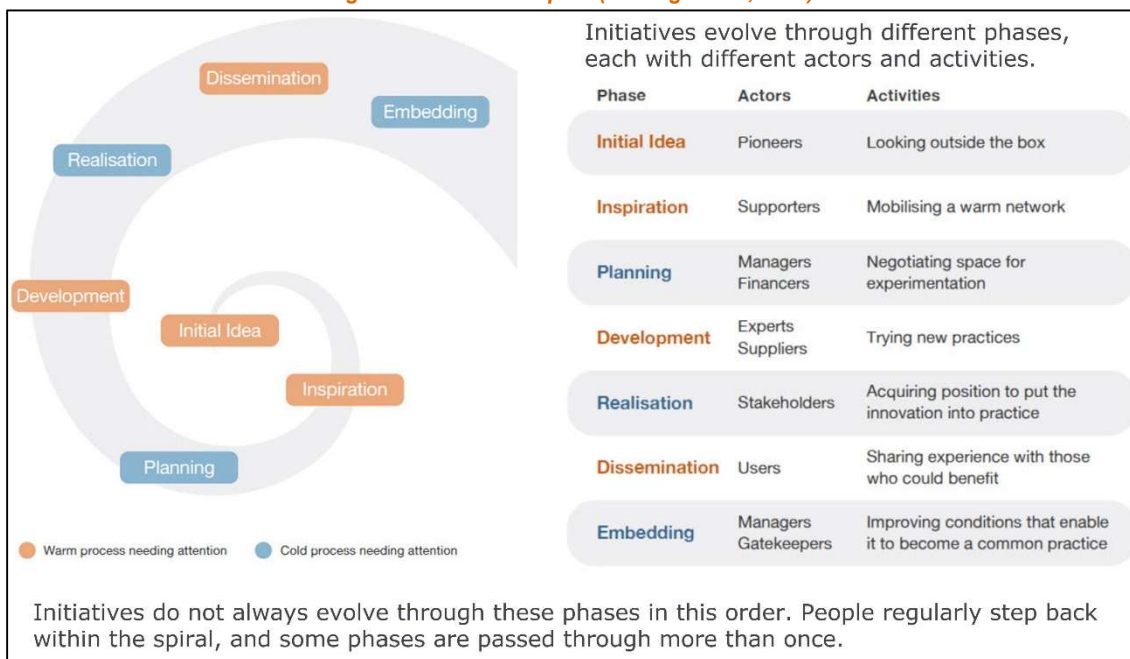


innovation and the numerous interactions between science and practice activities within and among enterprises. Through interaction and feedback different pieces of knowledge become combined in new ways or new knowledge is created.

In this case, the innovation process may be viewed as an iterative cycle with several (feedback) loops that repeat and adjust over time. A cycle begins with a need to solve a problem or grasp an opportunity and ends with its implementation and dissemination. Each problem-solving cycle produces changes (increase of available knowledge and organizational, social or economic changes), which in turn generates new definitions of problems and opportunities and, consequently, new research processes, according to a cyclical course.

The interactive innovation process, due to its features, is unpredictable. To describe it the **Spiral of innovation (or Spiral of initiatives)** model was conceived and applied (Wielinga et al., 2008, 2017) (fig. 2). The Spiral articulates the innovation process into seven non-linear phases or steps, which provides a picture of the interactions and communication flows within the actors involved in the innovation process. Moreover, the Spiral explicitly allows for feedback mechanisms in case the process in one stage gets stuck; this implies the existence of backward loops as well as the understanding that steps are not linear and may overlap (Koutsouris and Zarakosta, 2020). In each stage in Spiral of Innovations there are different key activities to be performed, actors to be involved and typical pitfalls to be avoided. The innovation starts with the initial idea phase; where actors get a new idea because of a felt problem or an opportunity. New initiatives could as well emerge from interactions. Next, during the inspiration phase others become inspired and form a warm informal network around the initiative. This includes people with shared interest or similar ambitions. In the planning phase, initiators formulate plan for action and negotiate space for experiments especially with people who control the conditions e.g. funds, mandates etc. During the development phase, experimentation is carried out, new practices developed and evidence collected to proof that these practices work. Then, in the realization phase, innovation goes into implementation at full scale. This requires negotiation with people affected by the change. During the dissemination phase, effective new practices are being picked up by others with similar interest and problems. Finally, in the embedding phase, new practice becomes widely accepted and existing structures and institutions incorporate this as normal. Here, what matter is new rules, laws, subsidies, taxes, to mainstream the innovation.

*Figure 2. Innovation spiral (Wielinga et al., 2008)*



## Multi-actor approach

The “multi-actor approach” aims to make innovation fully demand-driven, involving all the relevant actors, with complementary expertise, along the whole process cycle (Hearne and Wolferts, 2021)), from the participation in the planning of work and experiments, their execution, up until the dissemination of results and a possible demonstration phase (Knierim et al., 2020). According to Knierim et al., the relevant actors are those that share a complex problem, which requires new knowledge and practice and include actors from different societal sectors such as researchers, entrepreneurs, educators, government workers, NGO representatives as well as farmers/farmer groups, advisors, enterprises, etc. Each is involved through their personal interests and goals and/or institutional backgrounds, and brings to the table complementary types of knowledge, as well as a range of perspectives, values and interests (Beers & Sol 2009), to identify and discuss solutions and new ideas, contributing to a social learning outcome (co-learning). Through MAA, actors can negotiate about goals, decision making, and activities, co-creating results and enabling their ownership (Pereira et al., 2019). Ultimately, innovations that are generated through a multi-actor process, are expected to generate solutions that are well adapted and easier to apply by virtue of “cross-fertilization of ideas between actors, co-creation and generation of co-ownership” (European Commission 2017).

However, MAAs participatory nature depends on the number and type of actors involved and, above all, on the scope and extent of their involvement and their ability to bring about effective change (Rocchigiani and Herbel, 2013). Therefore, MAAs need to deal with issues of power and conflict to ensure equity and inclusiveness for all actors, as well as questions of competence to facilitate a wide variety of actors and ensure their active participation. Moreover, they need to use methodologies that can trigger motivation for change, provoking critical thoughts and strengthening relational values that may transform values and mental models towards new scenarios, reducing the fear and confusion that novelties can bring (Miller 2013).

### **Multi-level perspective**

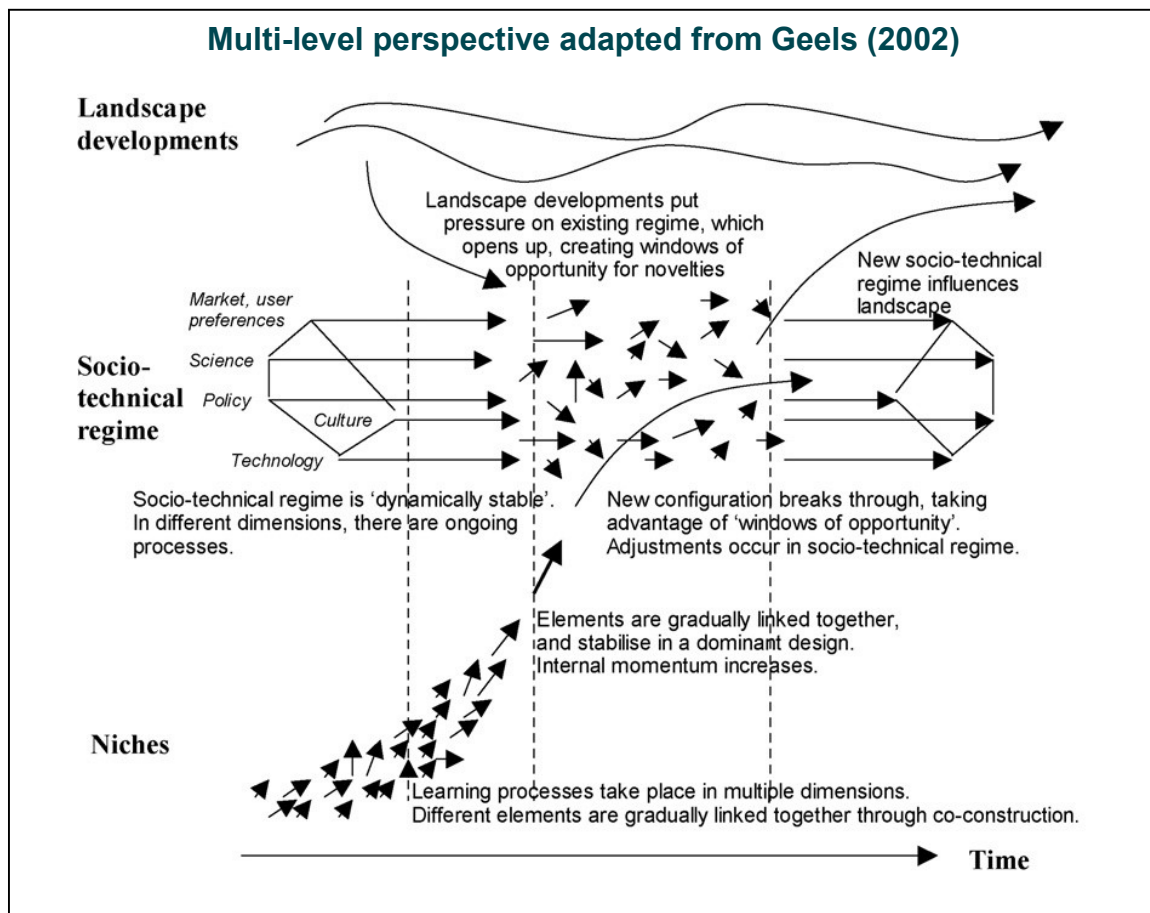
The multi-level perspective (MLP) is a theory that conceptualizes dynamic patterns of socio-technical transitions, namely sets of processes that lead to a fundamental shift in socio-technical systems (e.g., Geels and Schot, 2010; Kemp, 1994).

Systemic approaches to innovation point out that innovation is a change in a given socio-technical system in response to a problem or to an opportunity emerging from the context (Knickel et al., 2009). This process may happen as a more or less spontaneous adaptation to changing conditions of the context (for example, climate change, market demand, technological breakthrough) or as an effect of strategic action of some relevant actors. However, this change can occur up to a certain level, where rules are too strong to be changed and actors' resources are too limited (Brunori et al., 2011).

The MLP posits that transitions come about through interaction processes within and among three levels: niches, socio-technical regimes and a socio-technical landscape. At the lowest level of structuration, novelties, actors experiment new patterns of interaction and new ways to do things, and the outcomes are uncertain. At a higher level of structuration, niches, there is an adequate level of coordination within a given network, but the mode of operation can survive only because its size is limited and it does not challenge a broader set of rules. This set of rules, the regime, provides a general frame for coordination of activities within a system. In a given macro context, called landscape, consisting of major economic, natural and demographic trends, the regime provides a degree of stability, but landscape dynamics do affect regimes and may alter these (Brunori et al., 2011).

Bottom-up innovation is free to develop as long as it does not challenge the regime. When the regime is solid and coherent, innovation occurs into novelty and turns into niche, but it is not strong enough to 'overthrow' the regime (Brunori et al., 2011). Regimes may protect niche and even financially support them in order to survive, but they also might be resistant to formation of novelties and emergence of alternative / competing regimes. The regime can become weaker for internal contradictions, for the pressure of niches that provide alternatives, or as an effect of landscape change (Geels and Schot, 2007).

*Figure 3. Multi-level perspective adapted from Geels (2002)*



Potential capacity of bottom-up innovation to solve the problems of society (for example, those generated by landscape change) better than the incumbent regime may lead to the creation of an internal readjustment to the regime membership. In this case, the conditions for accelerating processes of niche diffusion, multiplication and scaling up may occur. Anyway, transitions are difficult to manage and may require brokers and policy support (Brunori et al., 2011).

## Transition

In agriculture, the term “transition” is used to indicate a reconfiguration of activities within the farm (Wilson 2008; Lamine 2011) but also as a radical change in agriculture. For instance, sustainability transitions is a “long-term, multi-dimensional and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption” (Markard et al., 2012).

Transitions involve deep changes at multiple levels and concern various aspects, including changing farmers’ objectives, knowledge, professional norms, values and motivations, and integrating natural resources into farming systems (Martin et al., 2018).

At system level, transition is conceptualised as the outcome of interactions between niches (spaces where new ideas and practices can develop) (Geels, 2011; Smith et al., 2010) and socio-technical regimes (the incumbent system of dominant technologies, practices and institutions) (Kemp et al., 1998). Many studies focus on niches’ potential to seed a transformation in the socio-technical regime (Elzen et al., 2012), as well as on systems capacity to support social learning processes leading to a change in political, economic and socio-cultural landscapes (Kemp et al., 1998; Schot and Geels, 2008).

## Operational group

Operational groups are multi-actor projects funded under the rural development policy 2014-2020, within the framework of the EIP-Agri. They have been established by Regulation (EU) 1305/2013 (art. 35) and reconfirmed by Regulation (EU) 2021/2115 (art. 127 (3)).

Operational groups engage a multiplicity of actors (farmers, researchers, advisors, businesses, environmental groups, consumer interest’s groups or other NGOs) in developing innovations in response to practical problems or opportunities for competitiveness and sustainability of farmers (EC, “Communication”, 2010). They promote an interactive approach to innovation aimed at developing new practices for farms and forestry, through the implementation of research results, the development of new ideas, and the testing and tailoring of existing techniques/practices to new geographical/environmental contexts. Operational groups are action groups, meaning that all the project partners must be actively involved in the definition and implementation of the project idea (co-decision), through a bottom-up

approach, as well as in the co-creation of knowledge, triggering a collaborative process between the actors from different fields and bridging the existing gaps between research and practice. They are also project-driven, since they are set up around an innovative project and result-oriented, since their task is to draw up an investment plan oriented towards the achievement of farm (and EIP-Agri) specific results (Cristiano and Proietti, 2014; European Commission, 2014). The innovative project must develop tailored innovative solutions focusing on farmers' or foresters' needs while also tackling the interactions across the whole supply chain, where useful. The composition of an operational group is also tailored, having to bring together partners with complementary knowledge in a targeted combination as best suited to achieve the project objectives.

## **Understanding different types of innovation support service providers**

### **Innovation broker**

The “innovation broker” (Herman et al., 2012; Perèz et al., 2010; EU SCAR, 2012), has been defined as “an agent or broker in any aspect of the innovation process between two or more parties”, whose activities include helping to provide information about potential collaborators, brokering a transaction between two or more parties, acting as a mediator or go-between bodies or organizations that are already collaborating, helping find advice, funding and support for the innovation outcomes of such collaborations (Howell, 2006). According to Klerkx and Leeuwis (2009b) the formation and functioning of innovation networks and systems can be problematic due to the existence of several gaps between actors. The main function of the innovation broker is to fill these gaps by connecting different players so as to facilitate knowledge exchange across the boundaries between them. In a broader view, these actors can also be agents of the process to accompany the group, leading the dialogue and the learning process through a continued focus to develop appropriate actions. As pointed out by Smits and Kuhlmann (2004), aligning different actors around a specific vision and enhance collaboration requires continuous interface management, as well as performing of a host of facilitation tasks that ensure that networks are sustained and become productive, e.g. through the building of trust, establishing working procedures, fostering learning, managing conflict and intellectual property management (Leeuwis, 2004).



## Free actor

Free actor is a person within a network who do whatever is required to promote the vitality of this network. The free actor acts freely, because s/he thinks it is important for the network, regardless of s/he has the mandate to do it (Wielinga and Robijn, 2020).

According to Wielinga, for keeping a network healthy it takes actors who are able to save connection between people. No network can do without. Free actors position themselves between the managers, initiators and providers of a network and build bridges between them. This way they act as catalyst for change.

Anyone can take the role of the Free Actor, provided s/he has the capacity to do whatever is necessary for the network, sufficient individual room for manoeuvre to bare the associated risks, sufficient insight to decide on an effective strategy to do so, and the position to get other network participants to accept their lead (Wielinga et al., 2008).

The role of the Free Actor can be fulfilled in various ways and positions and there is not a specific task description: s/he can carry out a variety of the initiatives that are needed to improve connections and energize the network.

## Hybrid actor

Hybrid actors are individuals and organisations that play a crucial anchoring role, meaning linking niche to regime thus supporting the initial adoption of innovations (in a multilevel perspective, anchoring is defined as the process in which a novelty becomes newly connected, connected in a new way, or connected more firmly to a niche or a regime) (Elzen et al., 2012).

Hybrid actors are part of the regime as well as the niche (differing from innovation brokers, who are typically outsiders to both regime and niche) and basically operate in their own interest (creating links is not their primary concern, differently from innovation brokers).

## Facilitator

Facilitators are types of innovation-change intermediaries that aim to create an ideal speech situation and, through the appropriate intervention strategies, help the participants of a group to engage in a communicative dialogue that results in consensual decision-making” (Habermas, 1984; Savage and Hilton, 2001; Cristóvão et al., 2012; Koutsouris, 2014). “Facilitators’ overarching role is “to



assist (individuals or groups) in solving mostly complex problems and in developing decision solutions” focusing on “the dynamics of a group and on how well people work together” to help them performing more effectively (Auvine et al., 2002; Murray and Blackman, 2006). To 'facilitate' the achievement of the task, the facilitator must have some competencies which are needed to build dialogue, mutual respect and shared expectations providing the right context for joint learning (Ingram, 2008). S/he must also be able to use tools concerning “the creation of circumstances for dialogue and to trust to emerge, such as reflexivity, mediation, brokering and networking for learning among stakeholders” (Koutsouris, 2008).

### **Boundary spanner**

Boundary spanners facilitate the management all kind of demarcations between and within different actors and social groups, thus enabling networks of actors from science, policy, and practice to align around a specific vision, negotiate a shared direction, and enhance collaboration.

According to Tisenkops et al. 2015, boundary work affects three key domains: joint learning, innovation and negotiating agricultural sustainability. Boundary work in learning is primarily about construction of common cognitive frames: alignment of ideas, perceptions, interpretations, meanings. Boundary work in innovation is more focused on joint action formation or alignment in practices. Boundary work regarding sustainability demonstrates both cognitive and practical alignment and may demand particular efforts from multi-stakeholder networks to develop and implement shared holistic solutions.

Boundary work is needed to solve tensions arising at the interface between actors with different views and to establish, as a consequence, language among them.

### **Transition intermediary**

Transition intermediaries (Steyaert et al., 2017, Kivimaa et al., 2018) are aimed at speeding up change towards more sustainable socio-technical systems. They are defined as ‘actors and platforms that positively influence sustainability transition processes by linking actors and activities, and their related skills and resources, or by connecting transition visions and demands of networks of actors with existing regimes in order to create momentum for socio-technical system change, to create new collaborations within and across niche technologies, ideas

and markets, and to disrupt dominant unsustainable socio-technical configurations’.

Transition intermediaries may have a specific mandate to facilitate transitions (Hodson and Marvin, 2009) or emerge, as new actors, even being unaware of their intermediation, in the transition process (Moss, 2009). They are engaged in both supporting niche innovations from the ground (e.g. performing intermediation functions between innovative local projects and a more aggregate level, or between actors within local projects) and breaking into the prevailing socio-technical regime (e.g. performing intermediation functions between consumers and producers, or between multiple network partners within an overall system comprising both niche and regime actors (Van Lente et al., 2003; Hodson and Marvin, 2009).

## Annex 2. Overview of capacity development interventions

The following table compares an extensive range of capacity development methods, from formal training to less informal peer networks.

**Table 3. Capacity development methods table**  
Adapted from <http://www.framework.org.uk/resources/>

Type of capacity building intervention	Characteristics	Useful for
One-off intensive training course	A structured event held in the workplace or in another venue, designed around a number of learning objectives, often following a Training Needs Assessment. Each session will have predefined objectives and content materials, with a detailed session plan to guide the trainer. Training methods vary - from traditional ‘classroom’ style to the highly participative action-learning approach.	<ul style="list-style-type: none"> <li>✓ Enhancing capacity at an individual level (competencies)</li> <li>✓ Conveying knowledge in a structured way</li> </ul>
Modular training course	Based on action-reflection cycle, consists of a series of structured events held over a pre-defined	<ul style="list-style-type: none"> <li>✓ Combining theory with practice</li> <li>✓ Enhancing capacity at an</li> </ul>



	period of time. Participants often are asked to do exercises on the topic of each module between each time they meet.	individual level (competencies) ✓ Conveying knowledge in a structured way
Technical expertise/advice	The focus is on the technical or professional content, or the technical systems required for the work to be effectively implemented and managed. Delivery may be as part of on-the-job accompaniment, or it may be delivered during a demonstration visit.	✓ Very focused interventions which have clear outputs or products ✓ Particularly useful for developing new systems at organisational level ✓ Ensuring quality standards ✓ Can be used to enhance individual knowledge and skills ✓ Appropriate for role of 'reflective observer' at low intervention stage
Mentoring	Mentoring involves passing on tips from experience, attitudes, knowledge, contacts etc. from more experienced individuals to less experienced staff. The 'mentor' is someone with an established reputation in the specific field.	✓ Building individual confidence ✓ Reinforcing individual attitudes ✓ Networking ✓ Leadership development
Coaching	Coaching is similar to mentoring but does not usually require that the coach has direct experience of their client's formal occupational role unless the coaching is particularly skills focused. The expertise of the coach is more in the coaching method itself.	✓ Enhancing individual skills ✓ Strengthening the application of newly acquired knowledge ✓ Structured reflection at individual level
Facilitated workshop or exercise	An event which is designed around specific objectives. These objectives can focus on the development of ideas and knowledge, or on the production of a specific output.	✓ Advancing particular initiatives via collaborative production of relevant outputs. ✓ Useful for intensive reflection and harvesting
Leadership development	Usually applied in a medium-term programme targeting existing or potential future leaders. This programme may draw on a mix of methods.	✓ May support and encourage individuals without formal leadership positions but who play an important influencing role within an organisation ✓ Useful as part of a leadership renewal strategy ✓ Useful as part of an overall organisation change process
Shadowing or Observing	Shadowing or Observing someone as they go about their day-to-day job or undertake a specific task.	✓ Very helpful for learning about practical applications of knowledge and skills in 'real life' situations



		<ul style="list-style-type: none"> <li>✓ Useful to gain an exposure to the ways of working of others</li> <li>✓ Contributes to building relationships</li> </ul>
Internship	The placement of an individual within an organisation for a pre-determined period of time.	<ul style="list-style-type: none"> <li>✓ Can help access to new methods, technical knowledge etc.</li> <li>✓ Useful for gaining a new perspective i.e. if the recipient organisation is a bit 'stuck' in their ways</li> <li>✓ An additional human resource</li> </ul>
Exposure or exchange visit / study visit	A pre-arranged visit aiming to learn about a specific experience, or gain an exposure to the ways of working of another organisation, project, team etc. Visits provide an opportunity for key actors to learn relevant, good development practice from their peers. Visits require in-depth planning, especially in terms of activities and participant engagement. For a visits to be successful, it is best to involve all participants (hosts and visitors) in the planning, in order to understand the expectations of both knowledge recipients and providers and reach consensus on the objectives of the exchange.	<ul style="list-style-type: none"> <li>✓ In-depth, face-to-face exchanges with peers (high level of interaction)</li> <li>✓ First-hand experience</li> <li>✓ Immersion in a topic</li> <li>✓ Builds networks</li> <li>✓ Builds commitment/excitement</li> <li>✓ Can be used to address many different capacity areas</li> <li>✓ Useful for gaining new perspective</li> </ul>
Community of Practice	Often 'virtual' in nature (i.e. exchanges are held over the internet), this is a group of people who interact regularly on a shared topic with the goal of learning from one another. A CoP can be formal, with a detailed mission, or informal, driven by peer exchange of knowledge and information. Its ongoing success depends on the participants' commitment for mutual learning and on a dedicated person(s) to manage/encourage group interaction.	<ul style="list-style-type: none"> <li>✓ Enhances individual knowledge</li> <li>✓ Contributes to mobilization of new ideas and to bringing in fresh perspectives</li> <li>✓ Encourages 'ownership' of learning</li> <li>✓ May benefit organisations as well as the individual participants</li> <li>✓ Fosters continuous learning</li> <li>✓ Allows network building and expansion</li> <li>✓ Increases visibility for issues of common concern.</li> </ul>
Action Learning Set	A group meets on a regular basis and uses a specific method to support each member in turn to reflect and act upon a work issue. See	<ul style="list-style-type: none"> <li>✓ Useful for leadership development</li> <li>✓ Contributes to addressing critical issues</li> <li>✓ Helps break down 'silos'</li> </ul>



	<a href="http://www.odi.org.uk/publications/5230-action-learning-set-process">http://www.odi.org.uk/publications/5230-action-learning-set-process</a>	<p>within systems/organisations/sectors if participants are from different categories/units/sectors</p> <ul style="list-style-type: none"> <li>✓ Builds peer relationships</li> <li>✓ Helpful to enhance active listening skills</li> </ul>
<p>Peer Consultation</p> <p><a href="http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/6427.pdf">http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/6427.pdf</a></p> <p><a href="http://www.youtube.com/watch?v=ObmQyW3EiiE">http://www.youtube.com/watch?v=ObmQyW3EiiE</a></p>	<p>Peer consultation is a process by which peers work together in small groups for mutual benefit, providing critical, yet supportive, feedback. The peer consultation process supports the diagnosis and analysis of a subject through reflective exchanges and practice. The key advantage of peer consultation is the contextual relevance and application of the feedback sought from peers, which facilitates trust and open conversation. Peer consultation can be organized in a face-to-face mode or via videoconference or an online discussion forum (max five or six participants to allow a good manage and generate the desired interaction).</p>	<ul style="list-style-type: none"> <li>✓ Strong interactivity</li> <li>✓ Spontaneous conversations</li> <li>✓ Immediate and timely peer exchanges</li> <li>✓ Concrete problem solving</li> <li>✓ Building up a peer network</li> <li>✓ Exposes participants to new perspectives, different ideas, increase access to additional resources practitioners to consult</li> <li>✓ Knowledge development (particularly on technical methods and approaches)</li> <li>✓ Cost-effective (if online tools used)</li> <li>✓ Can be recorded and reused later to support further reflection</li> <li>✓ Can reach a global audience</li> </ul>
Peer Review	<p>Peers engage in reviewing the work of another peer. This can take place at individual, team, unit, project or organisational levels. It can be part of a formal evaluation, or as an approach to peer learning.</p>	<ul style="list-style-type: none"> <li>✓ Relationship building</li> <li>✓ Exchange between more/less experienced partners</li> <li>✓ Ensure diversity of perspectives during an evaluation</li> </ul>
Peer / partner meetings	<p>Regular meetings with peers / partners may include the provision of some specific input with the aim of enhancing capacities. For example, inviting a guest speaker to discuss new developments in the sector.</p>	<ul style="list-style-type: none"> <li>✓ Focused knowledge development</li> <li>✓ Ensuring a common understanding amongst all partners</li> </ul>
Joint Monitoring and Evaluation	<p>Inclusion of individuals from partner organisations in the monitoring or evaluation of specific programmes.</p>	<ul style="list-style-type: none"> <li>✓ Particularly useful for enhancing M&amp;E capacity</li> <li>✓ As for 'Peer Review' above</li> </ul>
Signposting information and resources	<p>The provision of information and materials, or the indication of where to gain access to such materials and information.</p>	<ul style="list-style-type: none"> <li>✓ Enhancement of technical knowledge</li> <li>✓ Obtaining 'good practice' reference material and examples (e.g. of policies, curriculum, standards etc)</li> </ul>



		✓ Enhancement of knowledge management
Opening doors and facilitating access	Facilitating partners' access to new contacts, decision makers and other influential people and institutions as a contribution towards enhancing relational capacity and achievement of objectives.	<ul style="list-style-type: none"> <li>✓ Building relationships in a new technical area</li> <li>✓ Enhancing relationships for policy influencing</li> </ul>
Harvesting experiences	Systematization of experience with a view to sharing key points with others. The process of gathering the experiences is often done in a way which can help collective reflection on the advances of the work, lessons learnt etc.	<ul style="list-style-type: none"> <li>✓ Building a shared understanding</li> <li>✓ Useful as part of learning exercise, particularly if it enters the 'triple' loop of transformation (change or renewal of basic assumptions and mental models)</li> <li>✓ If a product emerges from the 'harvest', this can be used to enhance profile and credibility of the partner/s</li> </ul>
Accompaniment	The on-going, regular accompaniment of people. Capacity development takes place through largely informal means – conversations, joint working etc. More structured coaching may be incorporated into this on-going relationship.	<ul style="list-style-type: none"> <li>✓ Can be applied to any sphere of capacity development work</li> </ul>

