# i2connect

INTERACTIVE INNOVATION

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# Task 1.3
# Identify the "innovation advisor", competencies, qualification needs and organisational set-up
# Deliverable 1.4
# Repository of required competencies of an innovation advisor

**23 October 2020**

This report only reflects the views of the authors.

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## List of abbreviations

| | |
|---|---|
| AAS | Agricultural advisory services |
| AIS | Agricultural innovation systems |
| AKIS | Agricultural Knowledge and Innovation Systems |
| EAS | Extension and advisory services |
| ESCO | European Skills/Competences, qualifications and Occupations |
| EQF | European Qualifications Framework |
| GFRAS | Global Forum for Rural Advisory Services |
| ISS | Innovation support services |
| KIBS | Knowledge intensive business service |
| R&D | Research and development |

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# 1. Introduction

## 1.1 Context

Both in industrialised and developing countries, the agricultural sector has been dealing with a number of emerging challenges in terms of food security, climate change and sustainable rural development (EU SCAR, 2012; Gorman, 2019; Knierim et al., 2015; Prager, Katrin and Thomson, 2014). According to Klerkx and Leeuwis (2009), the (Dutch) agricultural sector faced several large-scale transformations which resulted in a number of problems and challenges, over the last two decades, that have also emerged in other developing and industrialised countries. They can be summarised by: (a) a transformation towards ecologically, socially and economically sustainable agri-food production systems; (b) a more heterogeneous knowledge demand due to the diversification of products and services (a need for tailor-made knowledge); and (c) the privatisation of public agricultural knowledge infrastructures in the late nineteen eighties and early nineties (a shift from supply-driven to demand-driven knowledge provision) (Klerkx & Leeuwis, 2009). This changing structure of the agricultural sector also makes new demands on farmers' entrepreneurial skills; nowadays they are required to play an active role in the acquisition of knowledge and information to support their business strategies (De Lauwere, 2005; Gielen, Hoeve, & Nieuwenhuis, 2003; Klerkx & Leeuwis, 2008a; Knudson, Wysocki, Champagne, & Peterson, 2004).

As a result of these transformations, the way of thinking about innovation and knowledge transfer gradually started to change, and thus also the view on agricultural extension and advisory services. The traditional linear knowledge transfer model is making way for the innovation systems perspective. The linear model considers the client (the farmer) as a passive actor who is supported by a provider (the advisor) who informs him/her on how to improve the firm (the farm) (Faure et al., 2019). While this view might still be valid to explain the diffusion of simple innovations (e.g. introducing new species), it fails to explain more complex innovations involving a variety of different actors (Faure et al., 2019; Leeuwis & Van den Ban, 2004). Innovation systems thinking emphasizes that organisations do not innovate in isolation but in the context of a system (Klerkx & Leeuwis, 2008c). Farmers are no longer the sole focus of advisory services, the innovation system perspective aims at enhancing the interaction between a multitude of actors (i.e. a multi-actor perspective); thereby focussing on the 'exploration' of knowledge rather than on 'exploitation' (Faure, Desjeux, & Gasselin, 2012; Koutsouris, 2012). A concept related to the innovation system perspective is that of 'interactive innovation' or the 'multi-actor approach'; which refers to projects where different stakeholders (farmers, agricultural advisors, scientists, etc.) collaborate to develop innovative solutions to practical problems (European Commission, n.d.). The idea behind interactive innovation is that these solutions have a greater chance of being relevant, as they are elaborated with and for farmers or other practitioners (European Commission, n.d.).

Over the past decades, several institutional reforms have taken place, in order to revitalise agricultural advisory services (AAS); these include decentralisation, public-private partnerships, privatisation, contracting-outsourcing, etc. (Birner et al., 2009; Faure et al., 2019). These transformations resulted in the emergence of new actors, with new ways of promoting and enhancing innovation processes (Faure et al., 2019; Labarthe et al., 2013; Leeuwis & Van den Ban, 2004). Faure et al. (2019) give several examples of new services in contemporary AAS: facilitating networking, facilitating access to financial resources, enhancing the articulation of demands by innovation actors, providing institutional support, especially for niche innovations, strengthening capacities for new business skills, and providing general consultancy and backstopping (Faure et al., 2019; Mathé et al., 2016).

More recently, intermediaries have emerged who fulfil a bridging function between the demand and the supply side of the knowledge infrastructure (Klerkx & Leeuwis, 2008a). Howells (2006) defined the innovation intermediary as "*an organization or body that acts as an agent or broker in any aspect of the innovation process between two or more parties. Such intermediary 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; and helping find advice, funding and support for the innovation outcomes of such collaborations"* (Howells, 2006; Klerkx & Leeuwis, 2008a).

According to Klerkx, Hall and Leeuwis (2009), innovation brokers synchronise the expectations of different actor groups during a number of innovation processes; they can act as a translator between their different worlds and they can act as a mediator in case of conflict (Klerkx, Hall, & Leeuwis, 2009). The involvement of innovation brokers in innovation processes can aid to avoid inertia and thereby help accelerate the process by helping projects members maintain their focus and energy throughout the process (Klerkx et al., 2009).

## 1.2 Purpose and development of deliverable 1.4

Considering the aforementioned changes and developments of the agricultural sector, the purpose of deliverable 1.4 is to provide a repository of required skills and competencies for 'innovation advisors' (i.e. professionals in interactive innovation support) and will not only focus on the individual level of professionals but will also include the organisational environment. The results of this deliverable will provide the bases for (self-)evaluation of advisory agencies in i2connects' WP3, and will particularly feed into task 3.1 'Understanding the patterns of knowledge, skills and attitudes' and task 3.2 'Develop training programs, training material and tools to enhance advisors' personal skills and networking skills and to support peer to peer learning between advisors'.

A thorough literature study formed the starting point of task 1.3. Sections 1 'Introduction' and 2 'The innovation advisor' focus on the agricultural context, the need

for innovation advisors, as well as the innovation advisor's roles and functions. These chapters are based entirely on what is mentioned in the literature.
Section 3 "Competencies for the innovation advisor and requirements for the organisation" provides a repository of required skills and competencies for the individual level. For this chapter a literature review also formed the starting point, after which an interview guide for semi-structured interviews was created and sent to members of the consortium for their input and feedback. This interview guide is included in Annex 1. Consequently seven interviews were conducted with both members from inside the i2connect consortium, as well as with external experts. From the results of the literature review and the expert interviews, a list of competencies and requirements was constructed and consequently discussed during a validation workshop with members of the i2connect consortium.

Section 4 deals with the enabling environment in which the innovation advisor operates. It provides responsibilities and requirements for the organisational level which were identified in a similar manner as the competencies for the personal level. Furthermore, this section describes implications for public policy which resulted from the literature review.

This paper builds upon the conceptual framework that was laid out in i2connects' deliverable 1.1 'Innovation advisors for interactive innovation process: Conceptual grounds and common understandings', which offers an elaborate description of key concepts such as advisory services, innovation support services, innovation processes, interactive innovation, AFKIS/AIS etc.; as well as documentation on several learning theories that are useful in facilitating competence development.

# 2. The innovation advisor

## 2.1 The 'innovation advisor': terminology in literature

Both in agricultural literature as well as in industrial literature, where innovation intermediaries have been more extensively described, a clear definition of innovation intermediaries seems to be absent (Klerkx & Leeuwis, 2008a). Moreover, a wide array of terminology is being used in literature to describe what we, in i2connect, refer to as 'the innovation advisor'. Sometimes they are referred to as 'brokers', sometimes as 'knowledge intermediaries', etc. As a first step in identifying the profile of the innovation advisor, several different views in terminology are presented:

In the field of agriculture, e.g. Orezcyn et al. (2010) refer to 'boundary agents' as intermediaries who act formally or informally at community or network boundaries to broker information, since they suggest that "new opportunities for learning occur at the boundaries of communities or networks of practice" (Manning, Soon, & Fisher, 2013; Oreszczyn, Lane, & Carr, 2010).

In the information technology sector, Bennis (1993) describes the 'change agent' as a person who must possess and integrate both social and technical skills (Bennis, 1993; Kendra & Taplin, 2004). Bennis states: "although they are aware of these three non-personal factors (i.e. technology, structure and task) and occasionally focus on them, their main preoccupation is with people and the process of human interaction" (Bennis, 1993; Kendra & Taplin, 2004).

Koutsouris (2012) distinguishes two main types of intermediaries in agricultural innovation systems, namely 'facilitators' and 'brokers'. According to him, a major role of extension is that of the co-learning facilitator, who should stimulate change and develop solutions and innovation by the development of shared meaning and language between dialogue partners (Koutsouris, 2012). He defines brokerage in the form of 'knowledge brokers' as a means to stimulate innovation by the facilitation of the spread of knowledge within and between organisations (Koutsouris, 2012). Furthermore, he distinguishes the 'innovation broker', which he links more to innovation genesis and who Winch and Courtey (2007) defined as "an organisation acting as a member of a network … that is focused neither on the organisation nor the implementation of innovations, but on enabling other organisations to innovate" (Koutsouris, 2012; Winch & Courtney, 2007).

De Bruin & Ensor (2018) did a literature review on the different names of the role of an intermediary within an innovation network. Table 1**Erreur ! Source du renvoi introuvable.** gives an overview of the different profiles they encountered. What is striking is that Kroma (2006) was the only study they came across which mentions extension associates, whereas the other authors saw the role of an intermediary as an option for any actor in a network (De Bruin & Ensor, 2018; Kroma, 2006). She argues for increasing the extension services' capacity as facilitators of group processes and that systemic changes in how these services connect and interact with farmers and technologies are necessary since they form the channel through which science is able to diffuse innovation and technology (De Bruin & Ensor, 2018; Kroma, 2006).

*Table 1: Different names for the role of the intermediary within an innovation network*

| **Name for an intermediary within the network** | **The role of that intermediary** | **Citation** |
|---|---|---|
| Researcher | Creator of a social space and supporting a space for experimentation | (Akpo, Crane, Vissoh, & Tossou, 2015) |
| Project monitor | Helps to monitor the learning process | (Beers, Hermans, Veldkamp, & Hinssen, 2014) |
| Coalition builders | Researchers who were considered to be committed to the local farmer's context and who frequently visited the | (Rossing et al., 2010) |

| | | |
|---|---|---|
| | farms | |
| Translators | Sit between technology and agriculture | (Eastwood, Chapman, & Paine, 2012) |
| Innovation brokers, inter-organisational brokers, systemic brokers | Inter-organisational brokers support the out scaling of innovation and systemic brokers who shape the innovation network itself | (Hermans, Beers, Stuiver, & Kok, 2013) |
| Extension Associates | Integrate farmers' experiences and understanding with scientific understanding | (Kroma, 2006) |
| Brokers or boundary spanners, roamers, outposts or pairs | Span the boundaries between farming networks of practice and other communities or networks of practice | (Oreszczyn et al., 2010) |
| Mediating human and nonhuman actors | Transform and translate different knowledge sources | (Schneider, Steiger, Ledermann, Fry, & Rist, 2012) |
| Boundary objects | The decision support system facilitated the conversation between actors and translation of different knowledge sources | (Thorburn, Jakku, Webster, & Everingham, 2011) |
| Frame openers, frame alignment facilitators, boundary spanners and peacemakers | Provide safe and neutral learning spaces, embrace all interests of actors and invite people into a process | (Tisenkopfs, Kunda, & Šūmane, 2014) |

Source: (De Bruin & Ensor, 2018)

As mentioned earlier, in i2connect, we choose to use the term 'innovation advisor' instead of more common used terms, such as innovation broker or innovation intermediary, as these often refer to a broader array of functions which can be performed by a range of different profiles.

## 2.2 Functions and contributions of the innovation advisor

### *2.2.1 Roles and functions of the innovation advisor*

Due to the large diversity of functions and roles that agricultural advisors can take up, as well as the unique situation specific to each farmer, it is only logical that a wide array of advisor profiles have spontaneously emerged. Faure et al. (2012) state the following: "the literature indicates that the pluralistic advisory landscape leads to a growing diversity of advisors' profiles largely depending on the advisory service providers' objectives" (Faure et al., 2012). Faure et al. further emphasise the relationship between advisors and farmers as a factor of identification of various profiles of advisors. They

refer to Andersen (2004) who identified different advisor profiles based on interviews with farmers and advisors in Denmark. Three main advisor profiles could be observed: the specialist who delivers his advice, the specialist who interacts with the farmer to tailor his advice and the advisor who listens and interacts with the farmer to construct the advice (Andersen, 2004). The latter is of course more related to interactive innovation and what we understand as an 'innovation advisor'. Anderson confirms that advisor-farmer interaction is necessary to orient the farmers' decision-making process but adds that the advisor profile strongly influences the intensity of the interaction (Andersen, 2004; Faure et al., 2012).

Similar to the wide array of terminologies associated with what we call innovation advisors, the role and different functions of innovation advisors have also been extensively described in literature. While there is often a lot of overlap, every author has its own specific perspective on what the innovation advisor's task is. The following section first presents an overview of the point-of-view of several significant authors and institutions, after which the choice for i2connects framework is presented.

The Global Forum for Rural Advisory Services (GFRAS) describes the role of extension and advisory services (EAS) in agricultural innovation systems (AIS) as being "about sharing and facilitating access to information, knowledge and expertise, and working with others to bring about innovation" (Sulaiman & Davis, 2012). They state that EAS should perform a wide array of innovation management functions; however, they emphasise that not all EAS providers have to perform all these functions. The functions the advisor will actually perform will depend on the local context, the demands of the farmer, the organisational mandate, the availability of resources and capacity (Sulaiman & Davis, 2012).

Hargadon & Sutton (1997) define the role of a broker as not merely having a linking or bridging function, but as a knowledge repository whose knowledge is used to provide solutions that are new combinations of existing ideas to their clients (Hargadon & Sutton, 1997; Howells, 2006).

Johnson (2004) described the roles of a broker as being mediator/arbitrator, sponsor/funds provider, filter/legitimator, technology broker and resource/management provider (J. D. Johnson, 2004; Klerkx & Leeuwis, 2009).

The Horizon 2020 project AgriLink "Agricultural knowledge: Linking farmers, advisors and researchers to boost innovation", where the concept of a farmer's microAKIS was conceived to conceptualise farmers' sources of knowledge, set up a dynamic model of farmers' decision making process, which builds on the 'Triggering Change model' by Sutherland et al. (2012) (Labarthe, Sutherland, Elzen, & Adamsone-Fiskovica, 2018; Sutherland et al., 2012). Labarthe et al. (2018) state that advisors can play a role at any stage in this model: from general awareness-raising during the path-dependency stage, to active advice provision during the 'active assessment' and 'implementation' phases. They further state that advisors may also be part of a triggering event in which they can

make farmers aware of particular activities or performance issues (Labarthe et al., 2018).

Howells (2006) conducted a set of case studies that involved semi-structured interviews with managers in 22 UK-based organisations to study the functions of innovation intermediaries. The study began with the conceptualisation of five main and well-documented functions or roles (Howells, 2006). On this basis, the case study organisations were analysed in terms of what intermediary function they undertook and the set of relationships associated with it, for their client firms (Howells, 2006). It became apparent during this research that the case study organisations undertook significantly more functions than originally conceived and consequently the list of functions was expanded with what Howells calls 'unrecognised' and 'undervalued' functions (Howells, 2006; Klerkx & Leeuwis, 2008a). These functions are listed in Table 2. (see Howells, 2006, p. 721-723 for a more elaborate description of these functions).

*Table 2: Innovation intermediation functions identified by Howells (2006)*

| | |
|---|---|
| 1 | Foresight and diagnostics |
| 2 | Scanning and information processing |
| 3 | Knowledge processing and combination/recombination |
| 4 | Gatekeeping and brokering |
| 5 | Testing and validation |
| 6 | Accreditation |
| 7 | Validation and regulation |
| 8 | Protecting the results |
| 9 | Commercialisation |
| 10 | Evaluation of outcomes |

Source: (Howells, 2006)

Howells (2006) further notes that these functions may be performed at different system aggregation levels. He states that some intermediaries operate in a simple 'one-to-one-to-one' basis, however intermediaries are also becoming increasingly involved in more complex relationships such as 'many-to-one-to-one', 'many-to-one-to-many' and 'one-to-one-to-many' or 'many-to-many-to-many' collaborations; thereby forming both horizontal and vertical relationships in increasingly distributed innovation networks (Howells, 2006; Klerkx & Leeuwis, 2009).

Klerkx and Leeuwis (2008c) captured the main functions of an innovation intermediary in agricultural innovation systems under the headings 'demand articulation', 'network brokerage' and 'innovation process management'. According to them, demand articulation means "articulating innovation needs and corresponding demands in terms of technology, knowledge funding and policy"; network formation refers to "the facilitation of linkages between relevant actors (scanning, scoping filtering and matchmaking of possible cooperation partners)" and innovation process management to "enhancing alignment and learning of the multi-actor network, which involves facilitating learning in the innovation process" (Klerkx & Leeuwis, 2008c, 2008a, 2009).

In this paper, we will follow the proposition set out in i2connect's Deliverable 1.1 'Innovation advisors for interactive innovation process: Conceptual grounds and

common understandings' to identify and characterise the activities and roles of the innovation advisor in innovation support services (ISS) by using the typologies of ISS functions compiled by Knierim et al (2018) and Faure et al. (2019) which was based on a thorough literature review and which is presented in Table 3**Erreur ! Source du renvoi introuvable.**.

*Table 3: ISS activities and their descriptions*

| ISS activities | Brief description/ of activities | Examples | Conceptual basis |
|---|---|---|---|
| Creating awareness and facilitating exchange of knowledge | Activities contributing to knowledge awareness, dissemination of scientific knowledge or technical information | Use of posters, official documents, databases, brochures, banners, fairs, field visits, policy briefs, guidelines, technical reports, thesis report etc. | (Leeuwis & Van den Ban, 2004)(C. W. Kilelu, Klerkx, Leeuwis, & Hall, 2011) |
| Advisory, consultancy and backstopping | Activities aiming at solving problems on actors' demands and at the co-construction of solutions | A case of visiting and advising, guidance on the job, support to problem-solving | (Leeuwis & Van den Ban, 2004) (Edquist, 2011) (Heemskerk, Klerkx, & Sitima, 2011) |
| Demand articulation | Services targeted to help actors to express clear needs to research, service providers, other actors | Price organized to award specific product, support to establishing project exposé | (C. Kilelu, Klerkx, & Leeuwis, 2013) (Oakley, 1991) (C. W. Kilelu, Klerkx, & Leeuwis, 2014) |
| Networking, facilitation and brokerage | Services to organize networks; improve relationships between actors, to align services, all activities aimed at strengthening collaborative and collective action. | Round table discussions, establishing contacts, Maintaining platforms and social media devices, acting as a mediator to solve a conflict/solve problem | (Albert, 2000)(C. Kilelu et al., 2013) (Oakley, 1991) (Heemskerk et al., 2011) (Auvine, Densmore, Extrom, Poole, & Shanklin, 2002) (Koutsouris, 2012) (Roth, 2003) |
| Capacity building | The services comprise the provision of classical training and of experiential learning processes. | Training on leadership, on management and planning, on how to manage a cooperative, how to work collectively, technical training etc. | (Leeuwis & Van den Ban, 2004) (Albert, 2000) (P. Labarthe, Caggiano, Laurent, Faure, & Ceft, 2013)(Allebone-Webb, Douthwaite, Hoffecker, Mathé, |

| | | | |
|---|---|---|---|
| | | | & Triomphe, 2016)(C. Kilelu et al., 2013) (Heemskerk et al., 2011) (Oakley, 1991) (Edquist, 2011) |
| Enhancing access to resources | Services enhancing the acquisition of needed resources for the innovation process. | Inputs (fertilizers, seeds, facilities, equipment), funds, access to market and acquisition of certification status | (Albert, 2000) (P. Labarthe et al., 2013)(Hekkert, Suurs, Negro, Kuhlmann, & Smits, 2007) revisited in (Klerkx & Leeuwis, 2009)(Hekkert et al., 2007) |
| Institutional support for niche innovation, and scaling mechanisms | Institutional support (incubators, experimental infrastructures, etc.), support for the design and enforcement of norms, rules, funding mechanisms, taxes, and subsidies, etc. | A survey to check if laws are followed, support actors to comply with the procedures, deliver certification, provide new authorization to implement new activities that were forbidden before | (Faure, Gasselin, Triomphe, Temple, & Hocdé, 2014) (Gadrey, 1994)(C. Kilelu et al., 2013)(Heemskerk et al., 2011) (Edquist, 2011) |

Source: (Faure et al., 2019; Knierim, Gerster-Bentaya, Mekonnen Birke, & Bae, 2020; Knierim, Ndah, & Gerster-Bentaya, 2018)
From i2connect deliverable 1.1 – Innovation advisors for interactive innovation process: Conceptual ground and common understandings

Faure et al. (2019) consequently conducted research on the diversity of ISS along the innovation process, following 'the spiral of innovations' model (Wielinga, Zaalmink, Bergevoet, & Geerling-Eiff, 2008). Faure et al. identified different services for the inspiration phase, the planning and development phases, the realization and dissemination phases and the embedding phases (Faure et al., 2019). The results can be found in Figure 1**Erreur ! Source du renvoi introuvable.**. These ISS are part of the generic seven ISS classes that are listed in Table 3. More information on the spiral of innovations can also be found in i2connects' deliverable 1.1 'Innovation advisors for interactive innovation process: Conceptual grounds and common understandings'.

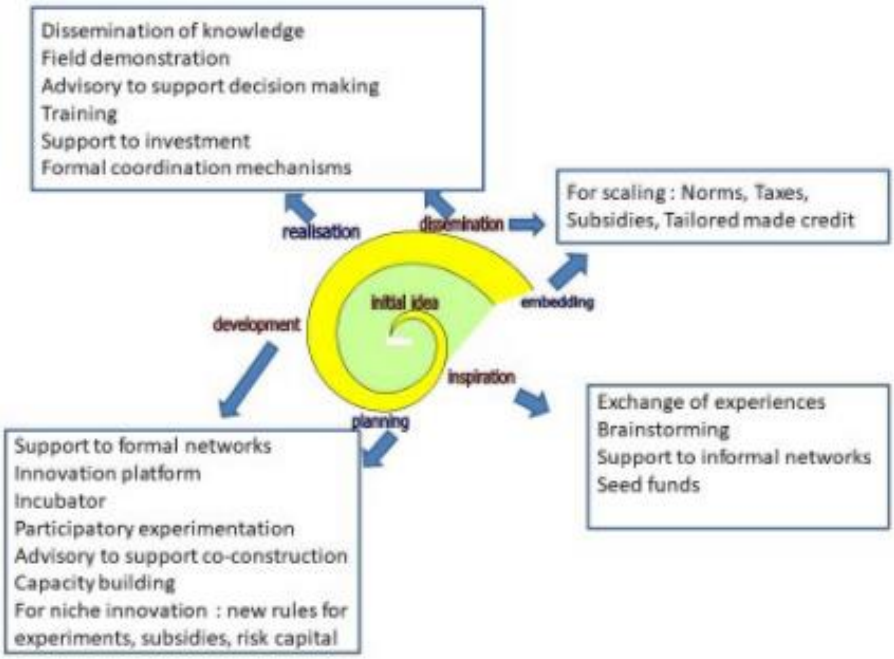


*Figure 1: Main type of ISS depending on innovation phases*

Source: (Faure et al., 2019)

### 2.2.2 Contributions of innovation intermediaries to facilitating innovation

Literature indicates that innovation brokers are perceived to have several beneficial influences on the agricultural knowledge infrastructure and innovation system interaction (Klerkx & Leeuwis, 2009).

Klerkx & Leeuwis (2008b) made a list of contributions of intermediaries to facilitating innovations which they deduced from qualitative case study research, which involved semi-structured interviews with managers and consultants active in twenty Dutch innovation intermediary organisations. These contributions are listed in Table 4 with a summary description. (See Klerkx & Leeuwis (2008b) for a more elaborate explanation of these contributions).

*Table 4: Reported contributions to facilitating innovation*

| | **Contributions** | |
|---|---|---|
| | | |
| 1 | Impartiality in the demand articulation and network brokerage process | Innovation intermediaries help to articulate innovation needs and create a strategic innovation plan without bias towards a preferred strategy or technology, but at the same time are critical and provide a mirror for self-reflection. They refer clients to the provider that best suits their needs in |

| | | |
|---|---|---|
| | | the pre-competitive stage, since they have no commercial interest in the provision of content oriented research and development (R&D) and knowledge intensive business service (KIBS) during the innovation process. |
| 2 | Easy accessibility to agricultural entrepreneurs | Organisations are often regionally embedded and located at sites familiar to agricultural entrepreneurs such as (former) experimental stations. Innovation intermediaries sometimes act proactively, creating demand by approaching entrepreneurs, or organise networking events, or make use of existing organisational structures. Several organisations offer services free of charge, at least initially, so entrepreneurs have less hesitation in giving it a try. |
| 3 | An extensive network amongst sources of knowledge and other resources | This search and connection function of innovation intermediaries enables them to forge linkages that entrepreneurs would not easily be able to make. Apart from forging linkages with sources of knowledge, other resources such as funding and policy support can also be mobilized. Depending on the complexity and novelty of the projected innovation, however, it may take considerable effort to form the right innovation configuration. Type 3 and type 4 organisations (see **Erreur ! Source du renvoi introuvable.**) explicitly aim to form new peer networks inside the agricultural sector and connect these with actors outside the agricultural sector. |
| 4 | Cognitive and cultural proximity with both end-users and sources of knowledge | Agricultural entrepreneurs often want quick access to applicable knowledge, while researchers have an interest in undertaking (publishable) research (AWT, 2005). They thus differ with regard to the time horizons of projects, and the desired output. Innovation intermediaries (types 1, 2 and 4, see **Erreur ! Source du renvoi introuvable.**) facilitate cooperation and synchronize expectations during innovation processes. The involvement of innovation intermediaries in innovation processes avoids inertia and can accelerate the process by helping entrepreneurs maintain their focus and energy during the process. |
| 5 | Capacity building at both demand and supply side for cooperation in innovation processes | Innovation intermediaries contribute to capacity building in respect of pro-activeness towards innovation, the articulation of innovation needs, networking skills for the setup of innovation |

| | | |
|---|---|---|
| | | networks, and knowledge and information acquisition on the R&D and KIBS market. Capacity building is an explicit aim for type 3 and type 4 organisations, however, less so for type 1 and 2 organisations (see **Erreur ! Source du renvoi introuvable.**). |
| 6 | Development of innovative concepts, exempted from market forces and current policy agendas | This provides the freedom to explore possibilities not tied to the current situation. Using the techniques of foresight and backcasting (see (Van der Meulen, de Wilt, & Rutten, 2003)), they develop innovative concepts in cooperation with relevant parties inside and outside the agricultural sector, and put these on the policy agenda. They also contribute to the formation of networks of actors to execute such innovation projects. Type 4 organizations have been set up for this purpose. |
| 7 | Context sensitivity | The regional approach of many innovation intermediaries (types 1 and 2, see **Erreur ! Source du renvoi introuvable.**) is appreciated by both clients and providers of R&D and KIBS. Clients' situations are better understood, and (centralized) R&D institutions may (re-)establish linkages with regional realities. |
| 8 | Fulfilling a liaison function | Innovation intermediaries facilitate knowledge and information flows between the different subsystems of the innovation system, i.e. inform research and policy agendas. By informing policy makers, necessary changes in legislation and policy frameworks can also be made. This liaison role may be passive, as is often the case for type 1 and 2 organisations (see **Erreur ! Source du renvoi introuvable.**), because these are client focused rather than aimed at informing other subsystems. It can also be active, as is the case for type 3 and 4 organisations (see **Erreur ! Source du renvoi introuvable.**), which install mechanisms and organize activities designed to bring about interaction between actors from different subsystems. |

Source: (Klerkx & Leeuwis, 2008c)

## 2.3 Types of innovation advisors

Klerkx & Leeuwis (2009) made a summary of different types of innovation brokers that have developed in the Dutch agricultural sector over the past few years. These brokers

can either be individuals or organisations. Since we feel they reflect the situation in many industrialised and developing countries, we included them in this report in Table 5**Erreur ! Source du renvoi introuvable.**.

Klerkx & Leeuwis (2009) state that these entities were mainly set up as innovation brokers or have evolved into being one over time. They further stress that innovation brokers often cannot easily be classified under one category as they are usually a hybrid of several functions (Klerkx & Leeuwis, 2009).

*Table 5: A typology of innovation brokers in Dutch agriculture*

| Type | Functions | Innovation Focus |
|---|---|---|
| 1. Innovation consultants aimed at individual farmers and agri-food SMEs | - Demand Articulation<br>- Network composition: scanning, scoping, filtering, and matchmaking<br>- Brokerage within established networks (innovation process management, i.e. enhancing alignment of actors and mutual learning) | - Innovations within individual enterprises<br>- Generally incremental innovation<br>- Short time horizons |
| 2. Innovation consultants aimed at collectives of farmers and agri-food SMEs | - Demand articulation<br>- Network composition: scanning, scoping, filtering, and matchmaking<br>- Brokerage within established networks (innovation process management, i.e. enhancing alignment of actors and mutual learning) | - Innovations relevant for groups of similar enterprises and in the context of a production chain<br>- Generally incremental innovation; Short time horizons |
| 3. Brokerage organizations that forge peer (interfirm) networks | - Demand Articulation<br>- Network composition: scanning, scoping, filtering, and matchmaking | - Innovations relevant for groups of similar enterprises<br>- Generally incremental innovation<br>- Short time horizons |
| 4. Systemic intermediaries for the support of innovation at higher system | - Demand articulation (including foresight)<br>- Network composition: | - Innovation at higher levels of system aggregation (entire |

| | | |
|---|---|---|
| level (systemic instruments) | scanning, scoping, filtering, and matchmaking; Research planning | production chain/ societal systems/policy systems)<br>- Generally radical/system innovation and transition trajectories<br>- Medium to long time horizons |
| 5. Internet-based portals and databases that display knowledge and information relevant to farmers and related parties | - Network composition: scanning, scoping, filtering, and matchmaking | - Broad range of links for addressing both operational or tactical problems and strategic innovation issues<br>- Short time horizon |
| 6. Boundary organizations that act at the policy/ research/user boundaries in research planning (i.e. research councils with ' innovation agency' (Gulbrandsen, 2005)) | - Demand articulation<br>- Brokerage within established networks (innovation process management, i.e. enhancing alignment of actors and mutual learning) | - Incremental and radical innovations<br>- Short to medium time horizon |
| 7. Boundary organizations that act at the policy/ education/research interface | - Demand articulation<br>- Network composition: scanning, scoping, filtering, and matchmaking | - Aimed at curricular innovation |

Source: (Klerkx & Leeuwis, 2008c, 2009)

## 2.4 Paradoxes in the functioning of innovation intermediaries

In their qualitative study regarding innovation intermediaries that have emerged in the Netherlands, Klerkx & Leeuwis (2008c) detected several tensions in the functioning of these innovation intermediaries. They are mainly tensions between the set-up and financing structures of organisations and their respective objectives, the possible intangibility and invisibility of their activities in an innovation process and their position vis-à-vis other R&D and KIBS providers. For a more elaborate description, see Klerkx & Leeuwis (2008c).

As a result of several studies, Klerkx & Leeuwis distilled their experiences with regard to tensions in the functioning of innovation intermediaries into three paradoxes. These paradoxes have been observed in the context of the Dutch agricultural sector (see (Klerkx & Leeuwis, 2008c, 2008a, 2008b)), but appear to manifest themselves in other sectors as well, which indicates that these problems are of a more general nature (Klerkx

& Leeuwis, 2009). We include them in this report as we deem them relevant in the search for the appropriate competencies for the innovation advisor.

**Neutrality or impartiality paradox**

The neutrality or impartiality paradox (a term first used by Gorton, Laschewski, & Phillipson ( 2002)) states that it is impossible for an innovation intermediary to be neutral as they always will exercise a certain degree of steering, even if they only facilitate interaction between other actors and don't provide substantive knowledge themselves (Klerkx & Leeuwis, 2009). Innovation intermediaries need to balance informal interaction as well as a formalisation of networks; they need to balance different kinds of demands as well as their accountability towards others (Klerkx & Leeuwis, 2009). This can have a direct influence on their present and future position (W. H. A. Johnson, 2008; Klerkx & Leeuwis, 2009; Van der Meulen, Nedeva, & Braun, 2005; Williams, 2002). Klerkx & Leeuwis (2009) further state that, in their experience, most innovation brokers attach much value to maintaining their impartiality/neutrality and thus have to prevent themselves succumbing to external pressures of e.g. a dominant financier.

**Functional ambiguity**

Another tension Klerkx & Leeuwis (2008a, 2009) deduced from their research is the unclear role division within innovation processes between a process oriented innovation intermediary and providers of content-oriented agricultural R&D and KIBS. It can therefore be difficult for actors in the knowledge infrastructure and innovation system to understand their position, as innovation brokerage can either be a function of a traditional knowledge intensive service provider, or of a dedicated brokerage organisation (Howells, 2006; Klerkx & Leeuwis, 2009; Pittaway, Robertson, Munir, Denyer, & Neely, 2004; Van Lente, Hekkert, Smits, & Waveren, 2003).

The issue with regard to the role division is what interest these parties have in becoming involved as sources or carriers of innovation, in addition to acting as facilitators of innovations, as this is linked to the impartiality they can exercise as a broker (Klerkx & Leeuwis, 2008a). Impartiality will always be influenced by what is to be gained in the innovation project when the innovation intermediary operates in a context where they have to derive their income from the market (i.e. privatised structures) (Klerkx & Leeuwis, 2008a). For instance, when an agricultural entrepreneur approaches a traditional R&D and KIBS provider, who also exercises network brokerage roles, the articulation of his needs and the selection of cooperation partners can be influenced in favour of the needs of the provider, rather than in favour of those of the client (Klerkx & Leeuwis, 2008a). Klerkx & Leeuwis (2008a) state that, although the added value of neutral, pure innovation intermediary lies precisely in this impartiality aspect, it is not always recognised. Conflicts about the role division between an innovation intermediary and more traditional R&D and KIBS providers can emerge, particularly after the innovation network has formed (Klerkx & Leeuwis, 2008a). The intervention of an innovation intermediary can be seen as unnecessary or some of the services they deliver can be perceived as not sufficiently differentiated from the services offered by traditional R&D and KIBS providers (Klerkx & Leeuwis, 2008a). Also, many of these

services are often intangible or immeasurable, which makes it difficult to prove its value (Klerkx & Leeuwis, 2008a).

**Funding paradox**

There are multiple tensions related to the funding of innovation intermediaries, which give rise to a funding paradox, meaning that innovation intermediaries fall victim to the system and market failures they are actually trying to tackle (Klerkx & Leeuwis, 2009). One of these tensions is the fact that it is often difficult to show the added value of innovation intermediation services, such as demand articulation, diagnosing and network brokerage, because of the intangibility of these services as well as their invisibility in the end result (Klerkx & Leeuwis, 2008a). Huggins (2001) found that, even if some firms recognise these contributions in hindsight, they are not likely to pay for it ex ante because of the perceived high risk of network failure (Huggins, 2001; Klerkx & Leeuwis, 2008a, 2009). A second funding paradox is what Klerkx & Leeuwis (2009) call a "funding impatience", referring to the short period in which public funding is provided, which impedes the innovation broker from becoming well-established. This is again enhanced by the fact that the contribution or the impact of innovation brokers is hard to make visible, since it cannot be measured by descriptive statistics (Klerkx & Leeuwis, 2009). Lastly, Klerkx & Leeuwis (2009) refer to the manifestation of a social dilemma, by which they mean that the contribution of innovation brokers is recognised, but individual actors who benefit from their contribution to the system's innovation capacity are not easily inclined to contribute long term to the brokers' funding without a short-term return-on-investment (Klerkx & Leeuwis, 2009).

# 3. Competences of the innovation advisor

## 3.1 Defining "competencies"

In literature, several definitions are used to define the term 'competency' or 'competence'. Some are of a more general nature, such as the definition of Cooper and Graham (2001): "Knowledge, skills or abilities required of the job" (Cooper & Graham, 2001) or the definition used in 'The New Extensionist Learning Kit' of the GFRAS Consortium: "The sufficiency of knowledge and skills that enable a person to act in a wide variety of situations. Competence is the ability to do something efficiently and effectively" (Davis, 2015; Umar, Man, Nawi, Latif, & Samah, 2017). Other definitions go further and include personal traits and social expertise. For example Stone and Bieber (1997) define competencies as "the application of knowledge, technical skills and personal characteristics, leading to outstanding performance" (Stone & Bieber, 1997). The European Qualifications Framework (EQF) as well as ESCO, the European multilingual classification of Skills, Competences, Qualifications and Occupations, apply the following definition of competence: "competence means 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). Both the EQF and ESCO define skills and knowledge as follows:

- "Skill means the ability to apply knowledge and use know-how to complete tasks and solve problems. They can be described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments). While sometimes used as synonyms, the terms skill and competence can be distinguished according to their scope. The term skill refers typically to the use of methods or instruments in a particular setting and in relation to defined tasks. The term competence is broader and refers typically to the ability of a person - facing new situations and unforeseen challenges - to use and apply knowledge and skills in an independent and self-directed way" (European Commission - DG Employment Social Affairs and Inclusion, n.d.-c).

- "Knowledge means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. Knowledge is applied and put in use in skills and competences" (European Commission - DG Employment Social Affairs and Inclusion, n.d.-b) .

## 3.2 The personal level: Identifying the competencies of an innovation advisor

To identify the competencies required of an innovation advisor, the structure 'Qualifications of an advisor' by Gerster-Bentaya et al. (2009) was used. This framework was also put forward in i2connects deliverable 1.1 'Innovation advisors for interactive innovation process: Conceptual grounds and common understandings'. According to the Hohenheim vision of advisory work, the advisor needs to possess a specific attitude and personality, as well as expertise regarding content, methods and management; he/she must also be willing to learn from experience and be able to reflect (Gerster-Bentaya, Hoffmann, Christinck, & Lemma, 2009). These requirements are visualised in **Erreur ! Source du renvoi introuvable.**.

In our search for the relevant competencies for the innovation advisor, the competencies that were identified during the literature review and during the interviews were analysed and sorted according to these five main themes by Gerster-Bentaya et al. (2009): (a) basic disposition and attitude, (b) content competence, (c) methodological competence, (d) managerial and organisational competence and (e) reflection, learning and personal development. Consequently, the list of competencies was analysed in a validation workshop which included members of the i2connect

consortium. During this workshop, the competencies were discussed in terms of relevance in the context of enabling interactive innovation processes, as well as in terms of trainability in the interest of i2connects WP 3 'Develop tools, methods & strategies to strengthen advisor's capacity to support interactive innovation'. Lastly, they were grouped into different clusters. The result of this study is presented in this section. Figure 3 presents an overview of all competency clusters found for the innovation advisor on the personal level.

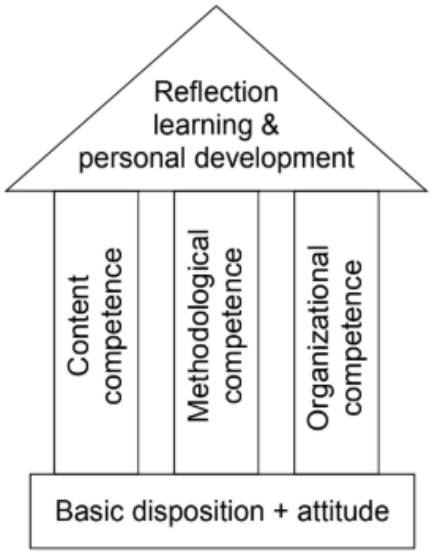


*Figure 2: Qualification of an advisor*

Source: (Gerster-Bentaya et al., 2009)

### 3.2.1 Basic disposition and attitude

**Hohenheim vision:**
The basic disposition and attitude of an advisor form the foundation of the advisor's competencies. It means the advisor needs to recognize and understand his/her role and responsibilities in the advisory process. Three basic attitudes form the basis for communication between the advisor and his/her client, namely congruency, empathy and appreciation (Gerster-Bentaya et al., 2009).

Under the theme 'basic disposition and attitude', four clusters with essential competencies for the innovation advisor were identified. Since these competencies are more of a personal nature, they proved to be difficult to reflect on in terms of training. However, for each of these clusters a main question emerged, which brings about the possibility of evaluating the needed competencies for each cluster: (a) How well do you

know yourself?, (b) How connected are you to your own drive?, (c) How well are you connected to others?, (d) How reliable are you?.

**Self-awareness**

The first cluster includes several competencies related to the question 'How well do you know yourself'. The advisor must possess a **sense of equity**. He/she is part of a network, in which each actor has his/her own field of expertise. The innovation advisor is not superior to the others and should have an attitude which recognises the skills and knowledge of other participants. He/she is not in the lead, but is more assisting and has a serving attitude. He/she is **willing to take a step back when needed** and is **willing to share power and give up control**. This issue also touches **self-awareness**. Trusting in your own competencies and in the competencies of others and accepting that there are different kinds of people who might think differently than you do, which in turn relates to **open mindedness**.

**Personal drive**

The second cluster consists of a number of competencies related to the question 'How connected are you to your own drive' and thus deals with one's **personal drive**. Everyone has certain desires and passions. The innovation advisor should learn that he/she is allowed to be passionate. By liberating this **passion**, the innovation advisor can be **dedicated** to the project he/she is serving. In this way, his/her attitude can change from 'this is what I have to do' to 'this is what I believe in', which will in turn reflect upon the whole network and make it thrive. The advisor also needs to learn to **trust in his/her own intuition,** as instinctively, we often know more than we think.

**Sensitivity**

The third cluster focusses on **sensitivity** and relates to the question 'How well are you connected to others?'. Innovation processes are discovery journeys, which cannot be planned in advance. Therefore, the innovation advisor has to be sensitive to what is going on. He/she has to be able to make the distinction between one situation and the other, in order to come up with an appropriate response to the specific situation he/she is in. This issue of **responsiveness** also relates to **empathy** and **emotional intelligence**; being able to be in deep connection with the person in front of you, to really understand his/her needs. For this the innovation advisor is required to have certain **communication skills** such as the ability to listen, non-violent communication, non-verbal communication skills, etc.

**Reliability**

The fourth cluster of theme 'basic disposition and attitude' provides an answer to the question 'How **reliable** are you'? The innovation advisor must be **accountable** for his/her actions. He/she has to be **trustworthy** in the eyes of others. This relates to **ethics**, the common values of the space we work in. These values will differ according to the context as they are linked to the sociocultural background of the actors involved. The innovation advisor also needs to be **responsible** and needs to possess a **professional attitude**.

### *3.2.2 Content Competence*

**Hohenheim vision:**
The advisor must be credible and reliable in his/her understanding of the subject matter as well as being able to connect the issue to the clients' specific situation/farming and family context (Gerster-Bentaya et al., 2009).

**Understanding social context**

The first cluster of theme 'content competence' is about **understanding the broader social environment** in which the project is embedded. The innovation advisor needs to understand who the main actors are. Who influences the system? The innovation advisor is able to **connect to the community**. Consequently the innovation advisor needs to **understand his/her own role** in this system. When the innovation advisor has a clear view of the network, he/she will **be able to identify the relevant actors**.

**Understanding AKIS**

Where the first cluster dealt with understanding the broad social context in which the network is embedded, the second cluster focuses more specifically on the AKIS. It is again about understanding the main actors, but also about **understanding the political and economic context**. The advisor needs to understand the AKIS in which the network operates. In order to do this, he/she must possess **basic knowledge about legal matters and the public policy** of the region.

**Basic requirements**

The third cluster of theme 'content competence' involves basic requirements the innovation advisor should possess. In terms of **educational background**, the innovation advisor should have a degree in higher education. In terms of background and training, we feel it might be beneficiary, although not essential, for the innovation advisor to have a **background in agriculture** and have a certain degree of **technical knowledge**. It is important to note that it is not about the technical knowledge itself, but about being able to relate to the people he/she works with and gain their trust. As mentioned before, this technical knowledge is not always necessary and depends on the project the innovation advisor works in. It might be worthwhile for the innovation advisor to possess T-shaped skills: the advisor has an area of expertise as well as broad knowledge in other areas**.** A second function of the technical knowledge is that it will help the innovation advisor to get to the knowledge the group needs in that moment. The innovation advisor needs to know who is there and who has what kind of knowledge, to create a larger network.

It would be useful for the innovation advisor to be **able to understand English**, although this is again not an essential requirement. Proficiency in English will help the innovation advisor to access knowledge (research papers, literature, trainings). In some cases there are possibilities to access this knowledge in a local language, which is why we feel it is

non-essential. Furthermore, the innovation advisor should have basic **digital skills** that will help him/her to e.g. access new information.

### *3.2.3 Methodological competence*

**Hohenheim vision:**
Methodological competence includes communication skills and techniques (individual advisory talks, group facilitation and training, etc), as well as diagnostic and analytical skills needed to interpret the verbal and non-verbal behaviour of people in order to gain an empathic understanding. The advisor must also be able to relate to the situation as his/her client subjectively perceives it (Gerster-Bentaya et al., 2009).

**Understanding innovation processes**

The first cluster of theme 'methodological competence' is **specifically related to innovation processes**. The innovation advisor should possess a certain **sensitivity for the process**. He/she should be able to **recognise patterns in an innovation process**, in order to be able to know whom to mobilise in what stage of the process. This also implies an innovation advisor should **know how to act in any given situation** and is able to choose appropriate actions depending on what the network needs at that specific moment. Furthermore, the innovation advisor needs **tools related to innovation processes** to be able to monitor if the group is still on track. An example of such a qualitative tool is learning histories, which can help other actors to get a better view of the situation. This cluster also concerns the **problem solving skills** the innovation advisor should possess.

**Energy**

The second cluster deals with **being able to keep energy and enthusiasm in the group**. The innovation advisor should **know how to activate and mobilise** people. Furthermore, the innovation advisor should **be able to moderate** the group and thus possess **facilitation skills.** The innovation advisor also needs **translation skills**. Sometimes different actors, although working in the same sector, speak different languages (figuratively speaking). It is the job of the innovation advisor to make them understand each other. Only then will they be able to work together.

**Co-creation**

The third cluster is related to co-creation. The innovation advisor should be able to **recognize crucial positions in the network** as well as being able to **identify missing positions in the group**. Furthermore, the innovation advisor should possess a **good insight in human psychology** in order to fill these missing positions.

**Mediation**

Lastly, the innovation advisor should possess **skills for mediation**. In case a conflict arises in the group, the innovation advisor should be able to respond adequately and try to get everyone on the same page again.

### *3.2.4 Managerial and organisational competence*

**Hohenheim vision:**
It is crucial for an advisor to adopt a neutral position, free from their own or any external interests. Furthermore, they should have no hierarchical relationship with their client. The advisor needs skills in self-organisation and self-management, he/she needs to use the space provided by the organisation to plan and implement his/her own work program, in line with the objectives and needs of the clients (Gerster-Bentaya et al., 2009).

For the theme 'Managerial and organisational competence', our vision on the neutral position of the innovation advisor differs from that of Hohenheim. In accordance with the neutrality paradox put forward by Klerkx & Leeuwis (2008a, b, c) (see chapter **Erreur ! Source du renvoi introuvable.**), we agree that it is impossible for an innovation advisor to adopt a complete neutral position since the organisation the innovation advisor works for already provides a non-neutral context.

There are three ways of looking at the position of an innovation advisor. The first assumption would be that the innovation advisor is neutral and organises the traffic, the process. This relates to the Hohenheim vision on the position of an innovation advisor. The advisor is merely present as a facilitator that does not steer the group into one direction. Consequently this implies that he/she will be ok with whatever the results of the process are. The second assumption would be that the innovation advisor is hired to achieve the goal of a specific organisation. This vision considers the innovation advisor as merely serving the organisation he/she works for. The third assumption is that of the free actor position in which the innovation advisor makes a connection with his own ambitions and therefore cannot be neutral. The issue here is not the job for which the innovation advisor is hired but rather the way he/she uses the space provided by the organisation he/she works for. This third assumption corresponds best to our vision on the position of the innovation advisor.

**Management and organisational competencies**

All competencies are grouped into a single cluster for the theme 'managerial and organisation competence', which encompasses the **management and organisational competencies** the innovation advisor should possess. These include skills such as **planning**, **being able to organise meetings**, **follow up with contacts, keeping track of your network**, **time management**, **managing resources**, etc. Other useful competencies for the innovation advisor would be to **be able to write a project proposal** and to **know how to collect funds**. The latter two could again be considered as non-essential

qualities. If the innovation advisor is able to **delegate** and find someone who can manage these task for him it is not necessary for him/her to be able to do it him-/herself.

### *3.2.5 Reflection, learning and personal development*

**Hohenheim vision:**
A professional advisor constantly looks to improve the quality of his/her work. He/she reflects on his/her work and actively approaches others (clients, colleagues, superiors, etc.) to ask for constructive feedback. Furthermore, he/she regularly attends training courses, seminars and exchange meetings to update his/her technical and methodological skills. The advisor is also linked to a professional network (Gerster-Bentaya et al., 2009).

**Reflection among peers**

The first cluster of this theme is about peer evaluation. The innovation advisor should learn to have the habit to **reflect upon his/her work with peers**. In order to do this it is important to have a **common language** and to be able to handle this language.

**Self-reflection**

The second cluster also deals with reflection but regards **self-reflection**. Complementary to peer-to-peer reflection, it is important the innovation advisor should have the habit of reflecting on his/her work by him-/herself.

**Addressing professional network**

The third cluster implies that the innovation advisor is able to **make use or address his/her professional network**. This competence is linked to keeping track of your network, which was addressed under management and organisational skills. Addressing the professional network goes further and implies the innovation advisor knows who to approach in a specific situation.

**Lifelong learning**

The fourth and last cluster deals with **skill development and learning**. It is linked to the first three clusters of reflection, learning and personal development as every cluster in this theme is about personal development. The innovation advisor should have a habit of learning, taking in new experiences and **know his/her way to new information**. He/she actively seeks out opportunities for training.

# PERSONAL LEVEL

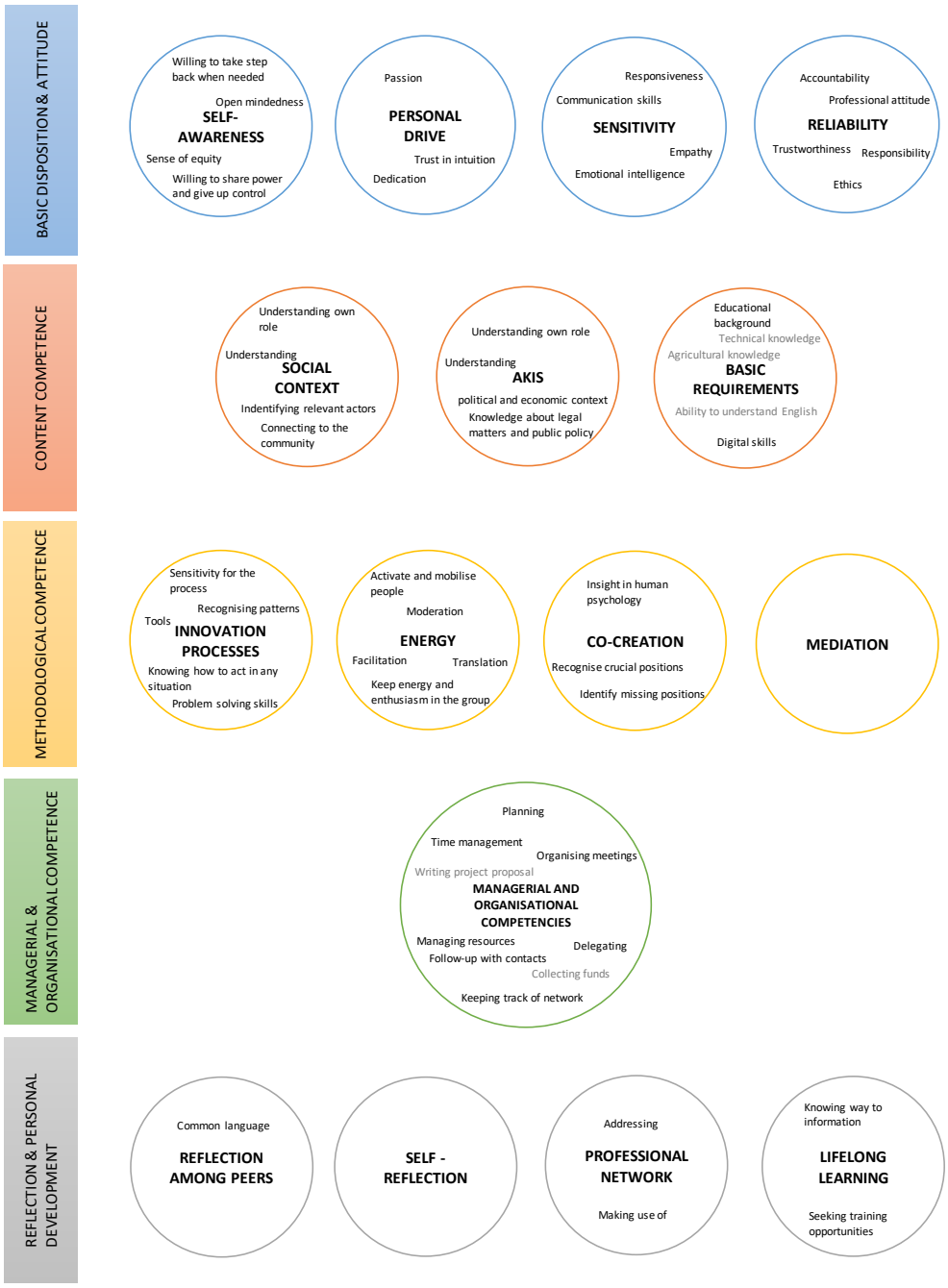


*Figure 3: Diagram of competencies for the innovation advisor - personal level*

# 4. The enabling environment

In i2connects deliverable 1.1, a nuanced understanding of the terms “capability” and “capacity is provided in which capacity refers to the ability of people, organisations and society as a whole to manage their affairs successfully (Knierim et al., 2020; TAP, 2016). Capability on the other hand is identified as being of a higher order than competence and refers to the “deployment and application of competences”, according to (CIDIT, 2016; Knierim et al., 2020). The document further states “an individual can have the right competences – skills, knowledge, attitudes - but in order to be capable, other enabling factors must be present that support the individual to apply his/her competencies. Here, institutional frameworks and supporting and supporting environments are considered key for making the transition from being competent to being capable” (Knierim et al., 2020). The innovation advisor thus needs to be supported by the organisation he is working for, as well as by the existing national and/or regional policies.

In this section we present several responsibilities and requirement for the organisation which were identified during our research. This profile for the organisational level is then followed by implications for policy making, described in literature.

## 4.1 The organisational level: responsibilities and requirements

To identify the requirements needed from the organisational level, we used a similar approach as for the personal level: requirements were identified from the literature review and during the interviews. Consequently they were analysed and clustered during the validation exercise with members of the i2connect consortium.
From this exercise, three main responsibilities for the organisational level emerged, under which different requirements could be clustered. They are presented in the following sections. Figure 4**Erreur ! Source du renvoi introuvable.** presents an overview of the responsibilities and requirements for the organisational level.

### Creating a safe space

The first responsibility for the organisation is creating a **safe space** for the innovation advisor to work in. For this the organisation needs to make sure it provides an **optimistic, supporting and trusting environment**. They should **allow freedom**, freedom to make mistakes as well as freedom for self-development. Furthermore, organisations should **offer continuity**. They should ensure that the knowledge and experience acquired within the context of the organisation stays there and try to keep staff turnover as low as possible. The organisation is also responsible for the needed **resources and infrastructure** as well as **financial support** and **organisational management**.

### Creating a challenging space

The second responsibility of the organisation is to create a **challenging space** for the innovation advisor. The organisation should **offer incentives** which keep the innovation advisor motivated. In order to keep advisors continuing their job, **correct wages**, **career opportunities** and **promotion systems** are needed (EU SCAR AKIS, 2019). Furthermore, the organisation should **employ a mix of people with complementary skills**.

### Stimulate learning and looking beyond borders

Lastly the organisation is responsible for **stimulating** its innovation advisors in further **learning**. They should assist in **organising seminars, trainings and cross-visits** or make sure the advisors are able to participate in relevant learning opportunities. The organisation should install a culture of **feedback and reflexion**. The organisation should also maintain **a(n) (inter-)national network** in which the innovation advisors can operate.

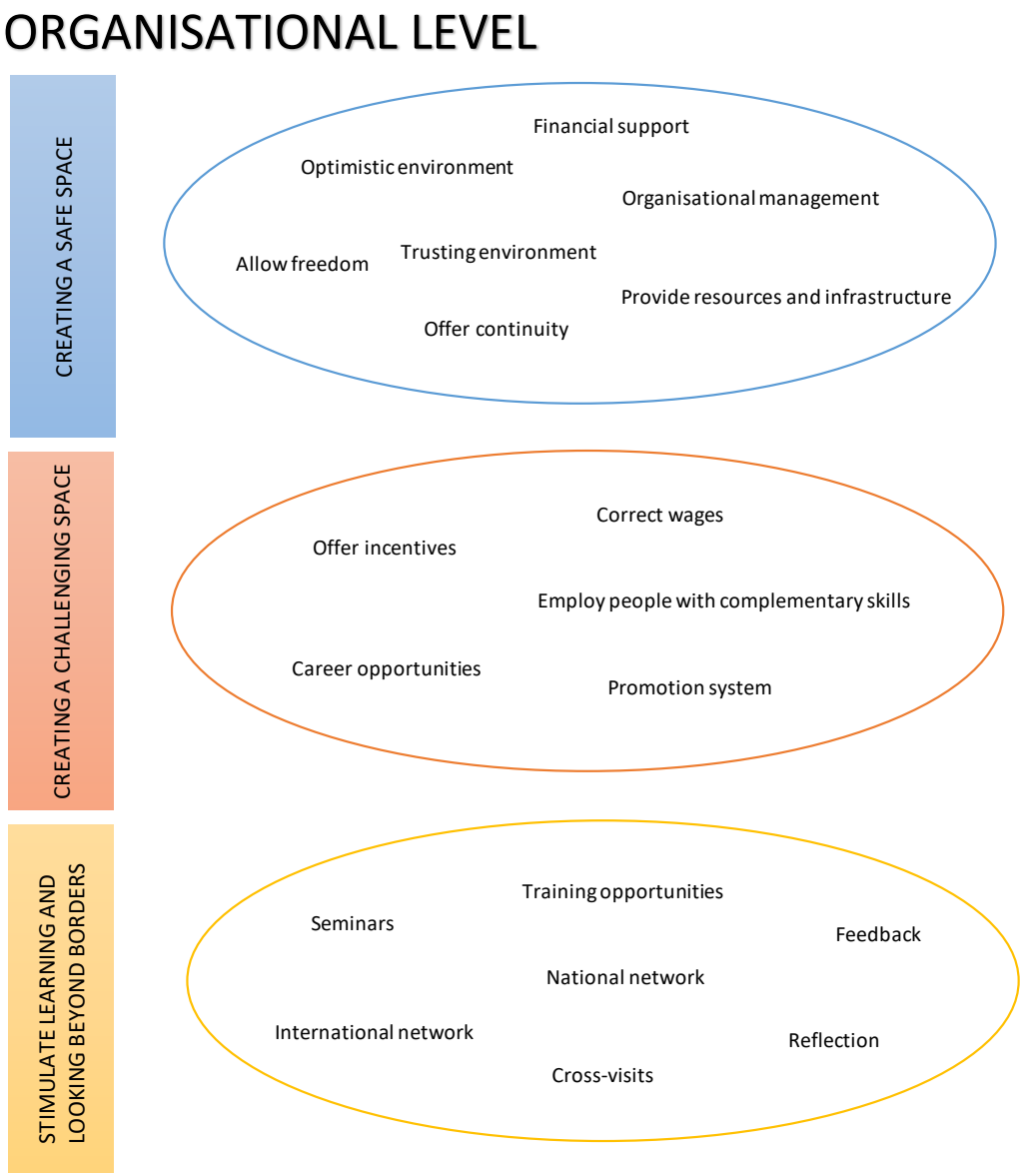


*Figure 4: Diagram of responsibilities and requirements - organisational level*

## 4.2 Policy implications

This section presents an overview of the literature regarding responsibilities for public policy on agricultural advisory and extension services.

Sulaiman & Davis (2012) refer to the 'enabling environment', which FAO defines as "policy, legal, and economic frameworks, national public sector budget allocations and processes, governance and power structures, incentives and social norms that facilitate (or hamper) development of an organisation" (FAO, 2010; Sulaiman & Davis, 2012). The performance of extension and advisory services depends crucially on the conditions that are present in the environment in which they are embedded; poorly conceived agricultural policies lead to a disabling environment with significant consequences for advisory services (Sulaiman & Davis, 2012). Sulaiman & Davis (2012) defined several conditions in the enabling environment as well as capacities for the enabling environment. For an overview see, Annex 2 and Annex 3. They further state that having all these enabling conditions is not necessary, however having many of these conditions will improve the opportunities for innovation (Sulaiman & Davis, 2012).

Across Europe, the Agricultural Knowledge and Innovation Systems (AKIS) are diverse. Innovation policies thus need to take into account the different preconditions in different Member States and regions (EU SCAR AKIS, 2019). With this in mind, the EU launched an AKIS-specific strategy process, which resulted in the publication of an EU-level AKIS strategy in June 2016, which guides the further programming of the Horizon 2020 programme (EU SCAR AKIS, 2019). The EU AKIS strategy identified five priority areas and six key principles that should be followed during its implementation. They are listed in Table 6 and Table 7.

*Table 6: Five priority areas defined by the EU AKIS strategy*

| | |
|---|---|
| 1 | Resource management |
| 2 | Healthier plants and animals |
| 3 | Integrated ecological approaches |
| 4 | New openings for rural growth |
| 5 | Enhancing the human and social capital and rural areas |

Source: (EU SCAR AKIS, 2019)

*Table 7: Six key principles defined by the EU AKIS strategy*

| | |
|---|---|
| 1 | Strategic programme management |
| 2 | Synergies with other (public) research activities |
| 3 | International cooperation |
| 4 | Allow space for innovative approaches |
| 5 | Synergies with the private sector (interactive innovation) |
| 6 | Multi-Actor Approach |

Source: (EU SCAR AKIS, 2019)

With regard to public expenditure on agricultural R&D, it seems global trends point to a rather flat pattern of expenditure, moreover, the source of public expenditure is shifting from traditionally richer countries to countries with strong economic growth (EU SCAR AKIS, 2019).

Kolodny et al (2001) state that job creation is one of the central functions of governments. According to the European Commission Green Paper on Innovation, SME's account for 66% of jobs and 60% of turnover in the European Union (European Commision Directorate-General XIII, 1996; Kolodny, Stymne, Shani, Figuera, & Lillrank, 2001). However, the report further states that access to know-how and information is far more difficult, as well as proportionately more expensive for SME's than for large businesses (European Commision Directorate-General XIII, 1996; Kolodny et al., 2001). Governments should see this as a serious concern because adopting new technology is often crucial to the long-term survival of a company (Kolodny et al., 2001). Kolodny et al (2001) further state that the question 'how to make SME's succeed' is not trivial; there are many choices to consider and the effects of these decisions are often difficult to evaluate. Moreover, even when appropriate policy decisions have been made, their implementation is neither obvious, nor easy (Kolodny et al., 2001).

Klerkx & Leeuwis (2009) state that the government can exercise its role as coordinator and mediator in innovation systems through innovation brokers (Hearn & Rooney, 2002; Klerkx & Leeuwis, 2009; Smith, 2000). However, it appears difficult to establish what the roles of the government are and what the roles of private sector are with regard to innovation brokerage (Klerkx & Leeuwis, 2009). In literature, there is a general agreement that publicly funded innovation brokers can fulfil the roles of demand articulation and network formation, however, when it comes to the involvement of a publicly funded innovation broker beyond the start-up phase of an innovation process, views tend to differ (Klerkx & Leeuwis, 2009). Klerkx & Leeuwis (2009) offer several arguments to justify a role for the government as a system coordinator and mediator through the continued funding of innovation brokers: (a) it appears difficult to make the basic functions of demand articulation and network formation self-sufficient, (b) innovation brokers contribute to systemic interaction and have a role as catalysts of innovation, (c) innovation brokers can more neutrally fulfil the role of facilitator (innovation process management) than parties that have a stake as sources or carriers of innovation in the subsequent research or innovation process (Klerkx & Leeuwis, 2009). However, they also point to some dilemma's in this regard: (a) the justification for public spending on innovation brokers, as impact evaluation appears to be difficult, (b) the proper demarcation of the mandate of publicly financed innovation brokers, (c) the risk that due to resource dependencies the innovation broker may become a more or less 'hidden messenger' for government or another party, which can be detrimental to its credibility and legitimacy. For a more detailed description of these arguments and dilemmas, see (Klerkx & Leeuwis, 2009).

Lastly, we want to point to a statement made by the Standing Committee on Agricultural Research (SCAR), namely that public funding should be considered when a market failure is present and education for advisors should be strengthened and publically

funded (EU SCAR AKIS, 2019). Furthermore they state that authorities should not act too "top down" when designing advisory systems (EU SCAR AKIS, 2019). Countries and regions should be allowed to design the organisation of their own advisory services to meet their own needs. However, overarching structures can help ensure quality as well as a level playing field throughout the EU (EU SCAR AKIS, 2019).

## 5. Conclusion

The purpose of this document was to identify the 'innovation advisor' and provide a repository of required competencies. From literature a wide variety of descriptions of the innovation advisor emerged, as well as a multitude of different competencies for advisors. We tried to translate and filter these qualities specifically into the context of facilitating interactive innovation. Apart from the data found in literature, expert interviews and a workshop with members of the i2connect consortium provided input for this repository.

Based on this, a profile for the innovation advisor (personal level) was created, based on the five main qualification themes, put forward in the structure 'Qualifications of an advisor' by Gerster-Bentaya et al. (2009). Each theme contains several clusters with different competencies which were identified as essential for the work of an innovation advisor. The results of this profile will provide input for training modules for innovation advisors, which will be created in WP 3.

Apart from the repository on the competencies of innovation advisors on the personal level, responsibilities and requirements for the organisational level were also identified. Three responsibilities emerged, under which several requirements were clustered.

During the process of drafting the repository of required competencies of the innovation advisor, two main questions emerged which we deem relevant to take into account in the further progress of the i2connect project, mainly considering WP 3 and WP 4. The biggest issue we came across was the question of trainability of several of these competencies. Some skills or qualities do not seem to be as straightforward to train as others. It will be a challenge to reflect upon ways to create an environment which will stimulate the acquisition of these competences. The second issue is related to the evaluation of acquired competencies. How can we measure to what extent an innovation advisor possesses certain skills or qualities? How can we evaluate the successfulness of the training program? We hope these questions will inspire and influence the work to come and together with the repository, provide a meaningful contribution to many interactive innovation processes.

## BIBLIOGRAPHY

Akpo, E., Crane, T., Vissoh, P. V, & Tossou, R. (2015). Co-production of Knowledge in Multi-stakeholder Processes: Analyzing Joint Experimentation as Social Learning. *The Journal of Agricultural Education and Extension*, *21*, 369–388. https://doi.org/10.1080/1389224X.2014.939201

Albert, H. (2000). Agricultural service systems: A framework for orientation. In Eschborn (Ed.), *Services for rural development GTZ*.

Allebone-Webb, S., Douthwaite, B., Hoffecker, E., Mathé, S., & Triomphe, B. (2016). What is capacity to innovate and how can it be assessed? A review of the literature. In International Farming Systems Association (IFSA) Europe. (Ed.), *12th European International Farming Systems Association (IFSA) Symposium, Social and technological transformation of farming systems: Diverging and converging pathways, 12-15 July 2016* (pp. 1–18). Harper Adams University, Newport, Shropshire, UK.

Andersen, H. (2004). Different personal skills and competencies which local agricultural advisers can use to co-create change in management procedures: A case-study of Danish dairy farmers and advisers. *The Journal of Agricultural Education and Extension*, *10*, 151–162. https://doi.org/10.1080/13892240485300171a

Auvine, B., Densmore, B., Extrom, M., Poole, S., & Shanklin, M. (2002). What do we mean by facilitation. *Group Facilitation: A Research & Applications Journal*, *4*, 53–55.

AWT. (2005). *Innovatie zonder Inventie.* The Hague, The Netherlands.

Beers, P., Hermans, F., Veldkamp, T., & Hinssen, J. (2014). Social learning inside and outside transition projects: Playing free jazz for a heavy metal audience. *NJAS - Wageningen Journal of Life Sciences*, *69*, 5–13. https://doi.org/10.1016/j.njas.2013.10.001

Bennis, W. (1993). Change agents. *Executive Excellence*, *10*, 18–18.

Birner, R., Pender, J., Nkonya, E., Anandajayasekeram, P., Ekboir, J., Mbabu, A., … Cohen, M. (2009). From Best Practice to Best Fit: A Framework for Designing and Analyzing Pluralistic Agricultural Advisory Services Worldwide. *Journal of Agricultural Education and Extension*, *15*, 341–355. https://doi.org/10.1080/13892240903309595

CIDIT. (2016). Key Terminology Unpacked. Retrieved from https://cidt.org.uk/capacity-strengthening/key-terminology-unpacked/

Cooper, A. W., & Graham, D. L. (2001). Competencies Needed to be Successful County Agents and County Supervisors. *Journal of Extension*, *39*(1), 1–7.

Davis, K. (2015). *The New Extensionist: Core competencies for individuals. GFRAS Brief 3*. (August), 1–16. Retrieved from http://ebrary.ifpri.org/cdm/ref/collection/p15738coll5/id/5143

De Bruin, A., & Ensor, J. (2018). Innovating in context: social learning and agricultural innovation. In *13th European IFSA Symposium: Farming systems: facing uncertainties and enhancing opportunities: Theme 1--Learning and knowledge systems, education, extension and advisory services*. Retrieved from http://ifsa.boku.ac.at/cms/fileadmin/Proceeding2018/1_deBruin.pdf

De Lauwere, C. (2005). The role of agricultural entrepreneurship in Dutch agriculture of today. *Agricultural Economics*, *33*, 229–238. https://doi.org/10.1111/j.1574-0862.2005.00373.x

Eastwood, C., Chapman, D., & Paine, M. (2012). Networks of practice for co-construction of agricultural decision support systems: Case studies of precision dairy farms in Australia. *Agricultural Systems*, *108*, 10–18.

Edquist, C. (2011). Design of innovation policy through diagnostic analysis: identification of systemic problems (or failures). Industrial and corporate change. *Industrial and Corporate Change*, *20*(6), 1725–1753.

EU SCAR. (2012). *Agricultural knowledge and innovation systems in transition – a reflection paper*. https://doi.org/10.2777/34991

EU SCAR AKIS. (2019). Preparing for Future AKIS in Europe. In *4th Report of the Strategic Working Group on Agricultural Knowledge and Innovation Systems (AKIS)*. Brussels.

European Commision Directorate-General XIII. (1996). *Innovation and Technology Transfer*. Luxembourg.

European Commission. (n.d.). Interactive innovation and the EIP-AGRI. Retrieved July 30, 2020, from https://ec.europa.eu/info/research-and-innovation/research-area/agriculture-and-forestry/interactive-innovation-

and-eip-agri_en

European Commission - DG Employment Social Affairs and Inclusion. (n.d.-a). ESCOpedia - Competence. Retrieved August 28, 2020, from https://ec.europa.eu/esco/portal/escopedia/Competence#:~:text=According to this %22competence means,terms of responsibility and autonomy.&text=In ESCO%2C competences are part of the skills pillar.

European Commission - DG Employment Social Affairs and Inclusion. (n.d.-b). ESCOpedia - Knowledge. Retrieved August 28, 2020, from https://ec.europa.eu/esco/portal/escopedia/Knowledge

European Commission - DG Employment Social Affairs and Inclusion. (n.d.-c). ESCOpedia - Skill. Retrieved August 28, 2020, from https://ec.europa.eu/esco/portal/escopedia/Skill

FAO. (2010). *Corporate Strategy on Capacity Development*. Rome: Food and Agricultural Organisation of the United Nations.

Faure, G., Desjeux, Y., & Gasselin, P. (2012). New Challenges in Agricultural Advisory Services from a Research Perspective: A Literature Review, Synthesis and Research Agenda. *Journal of Agricultural Education and Extension*, *18*(5), 461–492. https://doi.org/10.1080/1389224X.2012.707063

Faure, G., Gasselin, P., Triomphe, B., Temple, L., & Hocdé, H. (2014). *Innovating with Rural Stakeholders in the Developing Word: Action Research in Partnership*.

Faure, G., Knierim, A., Koutsouris, A., Ndah, H. T., Audouin, S., Zarokosta, E., … Heanue, K. (2019). How to Strengthen Innovation Support Services in Agriculture with Regard to Multi-Stakeholder Approaches. *Journal of Innovation Economics*, *28*(1), 145–1699. https://doi.org/10.3917/jie.028.0145

Gadrey, J. (1994). Les relations de service dans le secteur marchand. In *Relations de service, marchés de services*. Paris: CNRS Editions.

Gerster-Bentaya, M., Hoffmann, V., Christinck, A., & Lemma, M. (2009). *Handbook: Rural Extension. (Volume 3) Training Concepts and Tools*. https://doi.org/10.16309/j.cnki.issn.1007-1776.2003.03.004

Gielen, P. M., Hoeve, A., & Nieuwenhuis, A. F. M. (2003). Learning Entrepreneurs:

Learning and Innovation in Small Companies. *European Educational Research Journal 2 (2003)*, *2*. https://doi.org/10.2304/eerj.2003.2.1.13

Gorman, M. (2019). Becoming an agricultural advisor–the rationale, the plan and the implementation of a model of reflective practice in extension higher education. *Journal of Agricultural Education and Extension*, *25*(2), 179–191. https://doi.org/10.1080/1389224X.2018.1559742

Gorton, M., Laschewski, L., & Phillipson, J. (2002). The facilitation and formalisation of small business networks: Evidence from the North East of England. *Environment and Planning C: Government and Policy*, *20*, 375–391. https://doi.org/10.1068/c0066a

Gulbrandsen, M. (2005). Tensions in the research council-research community relationship. *Science and Public Policy*, *32*(3), 199–209.

Hargadon, A., & Sutton, R. (1997). Technology Brokering and Innovation in a Product Design Firm. *Administrative Science Quarterly*, *42*, 716–749. https://doi.org/10.2307/2393655

Hearn, G., & Rooney, D. (2002). The future role of government in knowledge-based economies. *Foresight*, *4*. https://doi.org/10.1108/14636680210453461

Heemskerk, W., Klerkx, L., & Sitima, J. (2011). Brokering innovation. In *Putting heads together: Agricultural innovation platforms in practice* (pp. 43–54).

Hekkert, M. P., Suurs, R. A. A., Negro, S. O., Kuhlmann, S., & Smits, R. E. (2007). Functions of innovation systems: A new approach for analysing technological change. *Technological Forecasting and Social Change*, *74*(4), 413–432.

Hermans, F., Beers, P., Stuiver, M., & Kok, K. (2013). The distribution of roles and functions for upscaling and outscaling innovations in agricultural innovation systems. *Agricultural Systems*, *115*, 117–128. https://doi.org/10.1016/j.agsy.2012.09.006

Howells, J. (2006). Intermediation and the role of intermediaries in innovation. *Research Policy*, *35*(5), 715–728. https://doi.org/10.1016/j.respol.2006.03.005

Huggins, R. (2001). Inter-firm network policies and firm performance: Evaluating

the impact of initiatives in the United Kingdom. *Research Policy*, *30*(3), 443–458. https://doi.org/10.1016/S0048-7333(00)00092-5

Johnson, J. D. (2004). The emergence, maintenance, and dissolution of structural hole brokerage within consortia. *Communication Theory*, *14*(3), 212–236. https://doi.org/10.1111/j.1468-2885.2004.tb00312.x

Johnson, W. H. A. (2008). Roles, resources and benefits of intermediate organizations supporting triple helix collaborative R&D: The case of Precarn. *Technovation*, *28*(8), 495–505.

https://doi.org/10.1016/j.technovation.2008.02.007

Kendra, K. A., & Taplin, L. J. (2004). Change Agent Competencies for Information Technology Project Managers. *Consulting Psychology Journal*, *56*(1), 20–34. https://doi.org/10.1037/1061-4087.56.1.20

Kilelu, C., Klerkx, L., & Leeuwis, C. (2013). Unravelling the role of innovation platforms in supporting co-evolution of innovation: Contributions and tensions in a smallholder dairy development programme. *Agricultural Systems*, *118*, 65–77. https://doi.org/10.1016/j.agsy.2013.03.003

Kilelu, C. W., Klerkx, L., & Leeuwis, C. (2014). How Dynamics of Learning are Linked to Innovation Support Services: Insights from a Smallholder Commercialization Project in Kenya. *Journal of Agricultural Education and Extension*, *20*(2), 213–232. https://doi.org/10.1080/1389224X.2013.823876

Kilelu, C. W., Klerkx, L., Leeuwis, C., & Hall, A. (2011). Beyond knowledge brokering: an exploratory study on innovation intermediaries in an evolving smallholder agricultural system in Kenya. *Knowledge Management for Development Journal*, *7*(1), 84–108.

Klerkx, L., Hall, A., & Leeuwis, C. (2009). Strengthening Agricultural Innovation Capacity: Are Innovation Brokers the Answer? *International Journal of Agricultural Resources, Governance and Ecology*, *8*(6). https://doi.org/10.1002/j.1538-7305.1978.tb02149.x

Klerkx, L., & Leeuwis, C. (2008a). Balancing multiple interests: Embedding innovation intermediation in the agricultural knowledge infrastructure. *Technovation*, *28*(6), 364–378. https://doi.org/10.1016/j.technovation.2007.05.005

Klerkx, L., & Leeuwis, C. (2008b). Delegation of authority in research funding to

networks: Experiences with a multiple goal boundary organization. *Science and Public Policy*, *35*(3), 183–196. https://doi.org/10.3152/030234208X299053

Klerkx, L., & Leeuwis, C. (2008c). Matching demand and supply in the agricultural knowledge infrastructure: Experiences with innovation intermediaries. *Food Policy*, *33*(3), 260–276. https://doi.org/10.1016/j.foodpol.2007.10.001

Klerkx, L., & Leeuwis, C. (2009). Establishment and embedding of innovation brokers at different innovation system levels: Insights from the Dutch agricultural sector. *Technological Forecasting and Social Change*, *76*(6), 849–860. https://doi.org/10.1016/j.techfore.2008.10.001

Knierim, A., Boenning, K., Caggiano, M., Cristóvão, A., Dirimanova, V., Koehnen, T., … Prager, K. (2015). The AKIS concept and its relevance in selected EU member states. *Outlook on Agriculture*, *44*(1), 29–36. https://doi.org/10.5367/oa.2015.0194

Knierim, Andrea, Gerster-Bentaya, M., Mekonnen Birke, F., & Bae, S. (2020). *I2Connect D1.1 - Innovation advisors for interactive innovation process: Conceptual grounds and common understandings*.

Knierim, Andrea, Ndah, H. T., & Gerster-Bentaya, M. (2018). *Co-designed conceptual framework for the inventory and characterisation of Innovation Support Services and Innovation Support Providers*. Stuttgart, Germany.

Knudson, W., Wysocki, A., Champagne, J., & Peterson, H. (2004). Entrepreneurship and Innovation in the Agri-Food System. *American Journal of Agricultural Economics*, *86*, 1330–1336. https://doi.org/10.1111/j.0002-9092.2004.00685.x

Kolodny, H., Stymne, B., Shani, R., Figuera, J. R., & Lillrank, P. (2001). Design and policy choices for technology extension organizations. *Research Policy*, *30*(2), 201–225. https://doi.org/10.1016/S0048-7333(99)00119-5

Koutsouris, A. (2012). Facilitation and brokerage: new roles for extension. *Journal of Extension Systems*, *28*(1), 18. https://doi.org/10.1017/CBO9781107415324.004

Kroma, M. (2006). Organic Farmer Networks: Facilitating Learning and Innovation for Sustainable Agriculture. *Journal of Sustainable Agriculture*, *28*, 5–28. https://doi.org/10.1300/J064v28n04_03

Labarthe, P., Caggiano, M., Laurent, C., Faure, G., & Ceft, M. (2013). PRO AKIS-Prospect for Farmers' Support: Advisory Services in European AKIS WP2-Advisory services within AKIS: International debates. Retrieved from http://proakis.webarchive.hutton.ac.uk/files/Deliverable_WP2 1_concepts and theories of AKIS(1).pdf

Labarthe, P., Sutherland, L. A., Elzen, B., & Adamsone-Fiskovica, A. (2018). Advisory role in farmers' micro systems of agricultural knowledge and innovation (microAKIS). In *Paper presented at the 13th IFSA symposium, Chania, Crete.*

Labarthe, Pierre, Caggiano, M., Laurent, C., Faure, G., Cerf, M., Cristovao, A., … Sutherland, L. (2013). *PRO AKIS Deliverable WP.2-1: Concepts and theories available to describe the functioning and dynamics of agricultural advisory services*.

Leeuwis, C., & Van den Ban, A. (2004). *Communication for Innovation: Rethinking Agricultural Extension* (Third edit). Oxford, Blackwell Publishing.

Manning, L., Soon, J. M., & Fisher, R. (2013). *The role of advisors in influencing change in the family farm*.

Mathé, S., Faure, G., Knierim, A., Koutsouris, A., Ndah, T. H., Temple, L., … Zarokosta, E. (2016). *Typology of innovation support services, WP1 AgriSpin, deliverable 1.4*.

Oakley, P. (1991). *Projects with people: The practice of participation in rural development.*

Oreszczyn, S., Lane, A., & Carr, S. (2010). The role of networks of practice and webs of influencers on farmers' engagement with and learning about agricultural innovations. *Journal of Rural Studies*, *26*, 404–417. https://doi.org/10.1016/j.jrurstud.2010.03.003

Pittaway, L., Robertson, M., Munir, K., Denyer, D., & Neely, A. (2004). Networking and innovation: A systematic review of the evidence. *International Journal of Management Reviews*, *5–6*(3–4), 137–168. https://doi.org/10.1111/j.1460-8545.2004.00101.x

Prager, Katrin and Thomson, K. (2014). AKIS and advisory services in the Republic of Ireland Report for the AKIS inventory (WP3) of the PRO AKIS project. Retrieved June 8, 2020, from www.proakis.eu/publicationsandevents/pubs

Rossing, W., Dogliotti, S., Bacigalupe, G., Cittadini, E., Mundet, C., Aguayo, V. M., … Others, A. (2010). Project design and management based on a co-innovation framework: towards more effective research intervention for sustainable development of farming systems. In *Building sustainable rural futures: the added value of systems approaches in times of change and uncertainty. 9th European IFSA Symposium, Vienna, Austria, 4-7 July 2010* (pp. 402–412).

Roth, J. (2003). Enabling knowledge creation: learning from an R&D organization. *Journal of Knowledge Management*.

Schneider, F., Steiger, D., Ledermann, T., Fry, P., & Rist, S. (2012). No-Tillage Farming: Co-Creation of Innovation through Network Building. *Land Degradation & Development*, *23*, 242–255. https://doi.org/10.1002/ldr.1073

Smith, K. (2000). Innovation as a Systemic Phenomenon: Rethinking the Role of Policy. *Enterprise and Innovation Management Studies*, *1*, 73–102. https://doi.org/10.1080/146324400363536

Stone, B. B., & Bieber, S. (1997). Competencies: A new language for our work. *Journal of Extension*, *35*(1), 3–5.

Sulaiman, R., & Davis, K. (2012). The "New Extensionist": Roles, Strategies, and Capacities to Strengthen Extension and Advisory Services. *Global Forum for Rural Advisory Services*, (November). Retrieved from http://www.g-fras.org/en/knowledge/gfras-publications/file/126-the-new-extensionist-position-paper?start=20

Sutherland, L.-A., Burton, R., Ingram, J., Blackstock, K., Slee, R., & Gotts, N. (2012). Triggering change: Towards a conceptualisation of major change processes in farm decision-making. *Journal of Environmental Management*, *104*, 142–151. https://doi.org/10.1016/j.jenvman.2012.03.013

TAP. (2016). *Common Framework on Capacity Development for Agricultural Innovation Systems: Synthesis Document.* Wallingford, UK.

Thorburn, P., Jakku, E., Webster, A., & Everingham, Y. (2011). Agricultural decision support systems facilitating co-learning: a case study on environmental impacts of sugarcane production. *International Journal of Agricultural Sustainability*, *9*(2), 322–333.

Tisenkopfs, T., Kunda, & Šūmane, S. (2014). Learning as Issue Framing in Agricultural Innovation Networks. *The Journal of Agricultural Education and Extension*, *20*(3), 309–326. https://doi.org/10.1080/1389224X.2014.887759

Umar, S., Man, N., Nawi, N. M., Latif, I. A., & Samah, B. A. (2017). Core competency requirements among extension workers in peninsular Malaysia: Use of Borich's needs assessment model. *Evaluation and Program Planning*, *62*, 9–14. https://doi.org/10.1016/j.evalprogplan.2017.02.001

Van der Meulen, B., de Wilt, J., & Rutten, H. (2003). Developing futures for agriculture in the Netherlands: A systematic exploration of the strategic value of foresight. *Journal of Forecasting*, *22*, 219–233. https://doi.org/10.1002/for.851

Van der Meulen, B., Nedeva, M., & Braun, D. (2005). *Intermediaries Organisation and Processes: theory and research issues*.

Van Lente, H., Hekkert, M. P., Smits, R., & Waveren, B. A. S. (2003). Roles of Systemic Intermediaries in Transition Processes. *International Journal of Innovation Management*, *07*, 1–33. https://doi.org/10.1142/S1363919603000817

Wielinga, H. E., Zaalmink, W., Bergevoet, R. H. M., & Geerling-Eiff, F. A. (2008). Networks with free actors: Encouraging sustainable animal husbandry by using the FAN approach (Free Actors in Networks): networking is sensing opportunities! In *Netwerken in de veehouderij*. Wageningen UR.

Williams, P. (2002). The competent boundary spanner. *Public Administration*, *80*(1), 103–124. https://doi.org/10.1111/1467-9299.00296

Winch, G. M., & Courtney, R. (2007). The organization of innovation brokers: An international review. *Technology Analysis & Strategic Management*, *19*(6), 747–763.

i2connect
INTERACTIVE INNOVATION

# ANNEX 1: Interview guide

**Identify the "innovation advisor", competencies, qualification needs and organisational set-up**

Interview guide

| # | Question | Background |
|---|---|---|
| **Introduction** | | |
| | Introduction interviewees<br>Background & experience | |
| **Defining ROLES/FUNCTIONS** | | |
| 1 | What do you understand as 'interactive innovation'<br>Bijvraag -> How would you define an innovation advisor | |
| 2 | What roles/ functions do you see for advisors in interactive innovation processes? | What do innovation advisors do?<br>What is their function?<br>What process can they facilitate? |
| 3 | What are challenges (you/your organisation/innovation brokers) face when trying to enable interactive innovation? | Identifying bottlenecks |
| **Identifying COMPETENCIES** | | |
| 4 | What essential qualities/competencies do you think a person should have in order to enable interactive innovation? | KEY QUESTION – Personal level |
| 5 | What is required from the organisation, and the wider context to enable this? | Conditions, resources, back-office set-up |
| 6 | Are you aware of topical literature about competency frameworks for innovation advisors? | How do they use it? Are they practical? Are they useful in the development process of competencies? |
| **Developing COMPETENCIES** | | |
| 7 | How can innovation brokers attain these competencies? | |
| 8 | Do you feel there is a need for the emergence of a new kind of advisory service or do you think the existing advisory services can take on this role? | |

# ANNEX 2: Enabling conditions in the enabling environment

**Enabling conditions in the enabling environment – GFRAS new extensionist**

| |
|---|
| Macroeconomic policies, incentives for increasing production, market reforms, and access to credit |
| Political commitment to agricultural development and recognition for EAS |
| Political and fiscal decentralisation and clearly demarcated roles and responsibilities of local government in agricultural development including support to EAS |
| Availability of a policy framework or policy for EAS and ways in which such policies shape behaviour of different organisations in the sector and AIS |
| Capacity and willingness of other actors in the AIS (research, education, private sector, NGOs) to share resources and expertise and engage in joint action with EAS and farmers/farmers' organisations |
| Institutions that facilitate and stimulate problem solving collaboration between different EAS providers and between them and other organisations in the AIS, rather than constraining organisations to formal mandates |
| Capacity of policy making process to adapt policies based on lessons learned from policy implementation and for defining policies in multi-stakeholder processes involving all parties concerned |
| Financing arrangements that stimulate client orientation, demand- responsiveness, and collaboration among EAS providers |
| Level of literacy as well as education in the country/province/region |
| Infrastructure (roads, telecommunications, markets, etc.) |
| Availability and access to financial services |
| Availability and access to inputs |
| Training institutions that can provide tailor-made training and learning support |
| Source (Sulaiman & Davis, 2012) |

# ANNEX 3: Capacities for the enabling environment

**Capacities for the enabling environment – GFRAS new extensionist**

| |
|---|
| Capacity of policy making bodies to adapt policies based on lessons learned from policy implementation, for reflective learning and adaptive change management |
| Initiating joint activities and collaboration between organisations in the AIS and the actors of the agricultural sector |
| Supporting organisation of workshops, seminars, joint research, commissioned studies, and joint evaluation that would bring out major areas that needs policy attention |
| Organising sector coordination mechanisms and multi-stakeholder working groups to develop and manage relationships among multiple actors and collectively develop strategic directions and policies for the sector |
| Generating adequate data that are required for evidence based policy advocacy and decision making |
| Sharing information on the activities of the EAS with farmers and their organisations, researchers, policy makers and politicians who are interested to address constraints through policy changes (use of websites, policy briefs, social networking sites) |
| Managing relationships with the media (communication and media management) |
| Source (Sulaiman & Davis, 2012) |