

How to implement effective and efficient agricultural innovation support systems? Some insights from an European cross – country analysis.

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Abstract

It is acknowledged that innovations in agriculture and rural development need to be adequately fostered. Within a system approach applied to this matter, the role of people and organizations able to catalyze innovation through bringing together of actors and facilitating their interaction is growing in relevance. In such a model the intermediaries are assumed to play a key role in developing social impact and sustainability outcomes for regional rural development.

In this perspective, the European Innovation Partnership for agricultural productivity and sustainability (EIP-AGRI), which can be perceived as a platform based on interaction among farmers, researchers, and advisors/extensionists, represents a useful tool for a better understanding of applied innovation processes.

Grounded in the activities performed within the EU Project Agrispin, in this paper we attempt to contribute to the identification of effective and efficient approaches for the implementation of the EIP-AGRI strategy.

Specifically, we present some preliminary findings on the functioning of EIP-AGRI system and Operational Groups across five European regions and countries (Italy, Poland, Germany, The Netherlands, and Belgium), by comparing different implementation modalities of the EIP strategies. With this analysis, we aim to portray the practical implications for agricultural innovation support systems. In addition, we interpret the role and the actions undertaken by public authorities in supporting such innovation systems in their regional contexts.

Finally, we try to explain the enabling dynamics behind institutional uptake of these innovations into the local public support systems, by addressing the issue of “institutional change” at both regional and local levels.

Keywords: innovation systems, sustainable agriculture, knowledge networks, innovation support systems, innovation brokers.

1. Introduction

In the agricultural sector, innovation is vital for sustainable economic, social and ecological development. Efforts to overcome the numerous barriers to effective innovation and cooperation are thus central to the public interest and justify public investments. To that end, the need of a systemic approach to innovation in agriculture and rural development is becoming largely acknowledged. The innovation system framework has been developed through decades of intellectual debates and featured relatively recently within agricultural science and rural development studies (Pant and Hambly Odame 2009). In this development context, agricultural innovation does not turn out in one dimensional, linear knowledge dissemination and adoption

process, but rather it depends on learning among multiple stakeholders (Leewis and Van de Ban 2004)

An agricultural innovation system (AIS) is characterized by structural elements and dimensions, according to the scale of the system we are looking at. Since their identification (Edquist 1997), innovation systems have been categorized as national or regional according to the unit of analysis (Wieczorek et al. 2012).

A broad definition of structural elements of the system (Johansson and Johnson 2000) comprises all the parts and aspects of an economic structure and the institutional set up affecting learning, searching and exploring: the production, marketing and finance system. Among the structural elements of innovation systems, it is acknowledged that actors and their interaction play a crucial role in such systems. Wieczorek et al. 2012 identified categories of actors based on their role in the economic activity: civil society, government, NGOs, companies/enterprises, knowledge institutes (universities, research centers, schools) and the one they call "other parties"; among the last one are included innovation and knowledge intermediaries and brokers, as well as consultants. These insights from agricultural innovation studies have urged policy-makers and rural development professionals to adopt different way of performing agricultural extension services (Chowdhury et al. 2014).

The different actors of the AIS thus need to interact with each other: an agricultural innovation system can be strengthened by facilitating collaboration in network of farmers, extension officers, policymakers, researchers and other actors in the agricultural system (Klerkx et al. 2013; Swaans et al. 2014). Thus, there is the need to enhance the support in this direction.

AIS is promulgated to undertake reforms in the knowledge and innovation support structures and requires operational concepts and tools in order to achieve a real institutional change based on partnership development (Spielman et al. 2009; World Bank 2012).

To that regard, there are a wide variety of policy instruments to support for innovation processes, such as research funding, patent regulations, or industry standard inducing innovation (Borràs and Edquist 2013). Recently, the literature has indicated that these mechanisms need to be complemented with "systemic instruments"; such instruments are oriented towards stimulating co-innovation approach and orchestrate adequate combination of individual innovation policy instruments and actors of the innovation system.

Moreover, the desired institutional change which characterize AIS operationalization, needs to ensure on-going adaptation that take into account learning and experimentation among individuals, organizations and networks as a core development strategy.

In this context, where collaboration among actors in order to speed up innovation need to be adequately fostered, the European Innovation Partnership for Agriculture Productivity and Sustainability (EIP-Agri) (COM 2012), which has the aim of stimulating such a co-innovation approach by fostering synergies between the Rural Development pillar (RD) of Common

Agricultural Policy (CAP) and Horizon 2020 policies, can represent a new operational tool to contribute to the desired institutional change.

Within this frame the AgriSPIN Project (N°652642) is one of the thematic network funded under H2020 EU research programme: it starts with the overall aim to improve innovation intermediary practices and support systems in European agriculture and to provide support to the EIP initiative. The Project also acknowledge that the role of intermediaries should be addressed to support innovation as a collective process of putting knowledge into practice, and achieving multi-stakeholder social, economic and environmental goals (Chowdhury et al. 2014).

This paper is grounded within the activities of the AgriSPIN Project and is aimed to better understand how the co-innovation approach of the EIP works, how it is translated into practice and which kind of barriers it presents. Moreover, we looked at the role of innovation support agents in fostering this approach.

The paper is structured as following: after an introduction of the EIP-AGRI overall approach and an explanation of research methods, the different strategies of EIP implementation in five case-study regions and countries will be addressed and compared; then, we will discuss their characteristics. To conclude, we will address the issue of the “institutional change”, which is needed to foster innovation but also presents several obstacles for its realization.

1.2 The EIP-AGRI overall approach

The Europe 2020 Flagship initiative “Innovation Union” specifies EIP as a new tool for speeding up innovation through linking existing policies and instruments. Consequently, the EIP-Agri is aimed at fostering a competitive agriculture and forestry sector by promoting the open innovation concept, that is based on the interactive innovation model; this concept implies collaboration between various actors to make best use of complementary types of knowledge in view of co-creation and diffusion of solutions/opportunities ready to implement in practice.

The EIP-Agri then, falls within two frameworks: CAP - Rural Development with focus on Knowledge Transfer, Cooperation and Counselling, and Horizon 2020 with its Thematic Networks and Multi-actor projects.

The EIP follows a bottom-up approach, in which the participants can organize an Operational Group (OG) around a concrete problem from their daily practice. Within an OG farmers and growers, consultants, researchers, entrepreneurs and/or other actors organize themselves around a particular issue, seek solutions and work together on specific innovations. The farmer and his/her question are central to the entire process.

Such OGs carry out projects aimed at testing and applying innovative practices, technologies, processes and products with the aim of strengthening the link between research and practice.

The involvement of farmers and growers has the advantage that more research-based practice will be determining for innovation, that there is more interaction between farmers and growers themselves, and that scientists learn more about how their research results are used in practice. Through their participation in OGs producers are co-owners of the innovation process rather than an object of study.

The EIP-AGRI also points out the importance of a supporting environment to incentivize innovation projects. Various types of support are considered important, in particular if done by persons well connected to the agricultural world and are well-networked. These correspond to different professions, such as Innovation Brokers (people who help to start up a specific group and prepare the project) and facilitators or intermediates (people who help to facilitate the project) and, more generally, innovation intermediaries.

Implementation of the EIP in Member Countries is started in different periods and follow different modalities.

According to a recent update of the Commission, 94 member states/regions will be implementing the EIP within their 2014 - 2020 Rural Development Programs with regular calls for OGs Projects. period (http://ec.europa.eu/griculture/rural-development-2014-2020/country-files/index_en.htm).

2. Methods

In order to identify effective and efficient approaches for the implementation of the EIP-AGRI strategy, we started with a preliminary study of such approaches, by realizing a cross-country, comparative analysis. Within this groundwork we selected five examples, among European regions and countries, of implementation of EIP-AGRI: Italy, with a focus on Veneto Region; the Shlezwig-Holstein Region in Germany, the Flanders Region in Belgium, the Netherlands, and Poland.

These examples were selected according to the differences they presented while approaching EIP-AGRI implementation as well as due to the fact that they have different organizational structures regarding extension services in agriculture and the management of the RDP. These differences allowed us to cover a broad, although not complete, spectrum of the current situation in Europe.

The data were gathered through a desk research of public documents, papers and direct, semi-structured interviews to relevant actors of each of the five cases: we interviewed people who are directly involved in the implementation strategy of EIP in their region or country (regional and provincial officers, responsible of regional and national EIP service point) and the profile of the interviewed was selected according to the institution which is in charge of implementing the EIP. The interviews were conducted according to a list of guiding questions aimed at deepening: the organization of the Agricultural Knowledge and Innovation System (AKIS); the overall approach

for EIP and the rules for its implementation, for example how the calls for OGs are managed; the role of innovation support services in implementing EIP strategy.

The questions were elaborated thinking to those aspects potentially useful to understand the EIP as operational tool for better understanding applied innovation processes.

We then compared the different scale of management of the EIP system and its functioning; how the EIP fits into RDPs; the management of OGs and their funding; the role of extension/advisory services within the EIP System.

3. Cross-country analysis

In the following sections results of the cross-country analysis will be presented. These result are organized following the list of guiding questions asked during the interviews.

3.1 Poland

The AKIS in Poland is managed at national level and it's characterized by the presence of the most relevant actors engaged in innovation and knowledge creation and transfer in agriculture. There are several research institutes and universities providing scientific knowledge and the central government is involved with several ministries; advisory services represent a determinant actor, with very strong and direct relations with farmers and their organizations.

The AKIS has a linear, top-down approach and appears to lack capacity in terms of coordination among different actors; farmers are, until now, seen as "clients" by advisory organization.

In order to strengthen the knowledge flow between AKIS actors, as well as to support the implementation of the EIP-Agri, in July 2015 the National Network for Innovation in Agriculture and Rural Areas (SIR) has been established.

The SIR is a National Network, centrally coordinated by the Agricultural Advisory Centre in Brwinów; Regional Authorities, with Regional Centers of Agricultural Advisory Services, are regional coordinators of this network.

The SIR was in charge of the organization of an open forum for all actors interested in innovation in agriculture, as well as of the animation of the potential partners of the EIP Groups.

In order to perform the activity of coordination, within the Agriculture Advisory Centre was created the National Centre for innovation. Concretely, the SIR and the professionals advisors of the National Centre organized targeted focus groups in order to identify strategic priorities and key areas of the National Innovation Partnership at the National level; the focus groups worked on thematic issue considered as priority for the agricultural sector in Poland and the thematic areas on which OGs will present their projects. These priority are: crop production, animal production (including animal welfare), organic farming, environment protection and agribusiness.

The brokerage is performed by the National Network and by the centre; it is integrated within the policy of rural development, because innovation support and the funding of EIP OGs are framed within the national RDP.

Innovation will be supported through a package of measures of the RDP: the measure 16 (cooperation) and the measure 1 (knowledge transfer and demonstration) but also measures related to investments on farm will be taken into consideration. Poland originally planned to fund 90 OGs; pragmatically, 25-30 will be funded and the first call is expected to be opened before the end of 2016.

3.2 Germany - Schleswig-Holstein Region

Schleswig-Holstein is a small region in Northern Germany and its AKIS is composed by a small number of actors. There are two research organizations involved: one university specialized in basic, scientific research and one public research institute of applied science. Besides, there is a Chamber of Agriculture as well as 7 farmers' schools and several private advisors.

These actors are partially connected: the Chamber of Agriculture is linked with the advisors but advisors are not interested in university research, as they considered it too far from the needs of farmers; the scientific knowledge providers of the AKIS do not work closely together with farmers' advisors.

In order to support the local innovation process in agriculture, in 2014 the Ministry (MELUR) has set up the Innovation Office EIP Agrar (coordinating body). It is hosted by the Schleswig-Holstein Chamber of Agriculture in Rendsburg.

On one side, the Innovation Office supports the Ministry in the implementation of the new EIP agricultural policy instruments and coordinates project work. Simultaneously, the Innovation Office provides OGs with information, assistance and support in the planning, implementation and execution of their project ideas. Networking between groups within Schleswig-Holstein and cooperation in Northern Germany with the regions of Lower Saxony and Mecklenburg-Western Pomerania is another important task.

Active public relations work ensures the exchange of information on project results and it supports the desired transfer of knowledge into practice.

Selected EIP Innovation Projects may be product innovations, such as the development of new types of product, or process innovations, which update existing technologies or tools, for example in a regional context. The implementation of EIP in the region is carried out according to the "bottom up" principle, i.e., the need for innovation comes ideally from practical demand and agricultural practitioners play a leading role in the development of solutions.

In order to follow this principle, in 2014, the EIP Agrar Office initiated an effort in networking between people and organizations who participated in a "call for innovative ideas" opened by the

ministry; the Office carried out a strong activity of brokerage and this helped the formation of 20 groups working on 20 project. In the second phase, a jury was established which selected 17 out of the 20 project and Groups to be funded. The selection criteria reflects the rural development priorities and the "sustainability goals" of Schleswig-Holstein region.

Since June 2015 and to date, the 17 OGs are still active and the projects will be funded for three more years. A peculiarity is that these first OGs were not funded under RD funds but with other resources; this has to do with the fact that when the region started the process the RDP was not approved yet. However, the second call will be under the measure 16 "cooperation" of the regional RDP.

The office is the principal Innovation Broker and provides support to OGs at different stages of the project development, by facilitating people and by working together as a team, and by providing information on how to get money and on other administrative matters.

The Office still support individuals and groups who have questions about EIP project proposals, are looking for project partners, or require further assistance within the OGs by providing information on funding opportunities, assistance with applications, mediation with research partners and assistance with administrative processing.

3.3 The Netherlands

The Dutch AKIS or DAISY, which stands for the Dutch Agricultural Innovation System is a Public-Private research partnerships is also known as the 'golden triangle from the polder' or the 'triple helix' uniting research, business, and government.

According to the Chief Scientific Officer real management of the AKIS is absent. The system expands by itself and with implicit incremental changes. On the other hand the current government recognizes general importance of DAISY and in particular the interaction and cooperation within its 'golden triangle' as an important asset and an example for other sectors.

In relation to the knowledge and innovation policy DAISY functions thanks to the presence of the following 5 factors: concentration of information within Wageningen University & Research Center that is responsible for the actual operational knowledge system; embeddedness of research in a consensus-seeking (polder) democratic society with a high concentration of information content for optimal policy making within the golden triangle of industry, knowledge institutions, and government; innovation, especially aimed at sustainability, is for policy makers a governance instrument that is continuously mixed with e.g. regulations or subsidies; correlation between innovation demands and innovation policies and regulations (for example, no support for organic farming without agreed standards). This development is seen as necessary fine-tuning process of policies; and finally research is conducted in the form of open interaction and information

transfer, which means that outsourcing or tendering can be complicated within this particular knowledge system.

Within this context each province in the Netherlands has to set up its own sustainable innovation agenda, which has to be seen as a document for long-term agricultural ambitions and urgencies of the region. For example, the three Nordic provinces of the country: Friesland, Drenthe and Groningen have written their common agenda in order to face the common challenges and objectives within the current program. This implies new role for the provinces in which they have to try out and experiment new approaches.

Implementation of RDP by the Dutch provinces has been translated into three measures for sustainable and innovative agriculture at the local level: training, workshops and entrepreneurial coaching; physical investment in innovation, promoting sustainability among young farmers; and cooperation within the framework of EIP-AGRI OGs.

Furthermore, the eligible innovation themes in the Netherlands have to be implemented at the provincial level have been selected by the National Rural Network and Support Unit for the EIP-AGRI. The Unit also provides also assistance to regional authorities, Innovation Brokers and project initiators.

Enclosure of EIP-AGRI into a broader innovation support system in the Netherlands for now means looking at the stay of play on the programming, calls, tenders, and difficulties surrounding the implementation of the European Agricultural Fund for Rural Development (EAFRD) at the provincial level in the Netherlands; until now it has been difficult to execute a combination of measures around an EIP-AGRI and OGs under the national tender regime.

Nevertheless, within the 12 Dutch provinces 11 out of 12 regional authorities will execute the EIP-AGRI strategy. Actual ambition is to establish 90 operational groups in the Netherlands; first calls were expected for late 2015 or early 2016 but are now postponed to the period May – June 2016. Innovation experts and knowledge brokers from the farmer organization LTO, Wageningen University, the Dutch golden triangle of agro-food and horticulture sectors, the national government, and the provinces have established a “help install the EIP”-team in order to smoothen the implementation of EIP strategy. Also they have defined the details for EIP-AGRI project approval of the operational groups. In addition, they have extended rural development network and national EIP platform providing support (current members of EIP-AGRI team plus Netherlands Enterprise Agency, Ministry of Economic Affairs) together with an independent expert team of Innovation Brokers for judging, evaluating and ranking the proposals.

It should be acknowledged that in the Netherland the approach of stimulating innovations through networking around bottom-up initiatives in not new and this could facilitate the implementation of EIP. An example is the network programme financed by the dutch ministry of agriculture and carried out by Wageningen University, based on the experimentation among 120 animal husbandry networks of the “Free actors in network” approach (Wielinga and Vrolijk 2009). After

the end of the project, since 2008 to 2013 the ministry of economic affair established a subsidy scheme for such bottom-up initiatives.

3.4 Italy –Veneto Region

In Italy, the managements of European funds for agriculture and rural development is an exclusive competence of the Regional Governments and their Managing Authorities; because of this, also the implementation of the EIP Strategy is assigned to Regions. The process, at national level, sow an intense debate between regional stakeholders, the Ministry of Agriculture and actors of “innovation chain”.

The implementation process presented some criticalities as well, such as the dominant role of some actors in the creation of partnerships and the low interactivity in knowledge and innovation transfer. These criticalities stressed the importance of the function of innovation brokering in order to foster the adoption of innovations. To date, all Italian regions have concluded the process of consultation with the EC for the approval of their RDP.

AKIS in the Veneto Region is not a formal organization, the actors collaborate in an informal network.

Farmers and their forms of representation (product organizations and farmers' associations/unions) are recognized as the main actors of the regional AKIS and they appear connected both with universities and secondary agriculture education schools.

The research side of the AKIS is represented by three Universities with their departments of agriculture and animal husbandry. Both disciplines collaborate with the departments of urban and landscape study of these universities themselves; the agricultural landscape as a whole is considered an important resource for the economy of the region and because of that all the scientific areas dealing with this topic (agricultural production, veterinary science, landscape planning etc) need to be adequately coordinated. In Veneto is also present a regional headquarter of the Council for research in agriculture and agricultural economics (CREA).

A key role in the AKIS of Veneto is played by Veneto Agriculture, the “Regional Agency for Innovation in the primary sector”. The agency is an instrumental body of the Regional Administration and offers training for agricultural advisors, information actions for farmers and testing of innovations within its experimental farms located throughout the region.

In addition to training and information actions, Veneto Agriculture will be in charge of the coordination of the AKIS in Veneto; the regional government as well as the other actors of the system (especially universities and farms) acknowledged that the governance of the system has been lost over time and therefore the need for coordination was strongly expressed.

Regarding the implementation of the EIP-AGRI, the region has started to work on the process in 2010, when a permanent forum on innovation in agriculture was established; the regional agency

played a crucial role in the coordination of this network. The aim of this forum was to define a common regional strategy for innovation in agriculture and to help the regional government to start and manage the process towards OGs.

For the definition of the areas of activity of OGs, the Region decided to not identify any priorities, in order to guarantee the bottom-up approach as expected by the Commission. Innovation is, in any case, a cross-cutting objective in all measures of the RDP .

The choice of valorization of the bottom up approach on the one hand guarantee an openness in the evaluation of the project proposals, on the other could represent a complication from a procedural point of view, especially for the definition of the selection and evaluation criteria to apply. The Region planned to fund 27-30 OGs; the calls are expected to be published before summer and will remain opened until October 2016. For new-born OG, the regional government is considering other sources of funding for the implementation of projects, eg the EAFRD.

Veneto Agriculture will be in charge of the support service for the establishment of the OGs and for the writing and finalization of the projects. It will also provide support to the regional government even in the evaluation phase of the proposals that will occur in two steps: a commission composed by the agency and by external evaluators will select the best proposals; a second commission will decide which proposals to fund, taking into account the fairness with the general guidelines of the region. The Regional Agency assumes the role of innovation broker for the setting up of OGs.

3.5 Belgium – Flanders

For a better understanding of the Flemish AKIS it is important to consider the contextual and aspect of the Belgian federation state and the fact that policies on research (partly), innovation, education and agriculture are regional instead of national matters.

The vision of the Flemish government is that agriculture is not an isolated entity. AKIS and the supporting policies should provide links and crossovers to ICT, food and other sectors in the bio-economy.

Within the Flemish AKIS several actors are involved in agricultural research: universities, the Institute for Agricultural and Fisheries Research (ILVO), university colleges and experimental stations. When it comes to the extension services the Flemish government organizes collective information or activities and (co-)funds training courses by approved centres. The provincial authorities have complementary activities, for example experimental farms and education initiatives. Other services that aim for individual information and guidance are in general offered by private organisations (especially the Flemish Innovation Centre for Agriculture and Horticulture) or private services with additional government funding (such as the farm advisory system).

The agricultural support system covers a very broad field of activities and most relevant actors in Flanders are the farmers' organizations.

Other actors within the support system are knowledge networks and study clubs, and cooperatives. Besides, there is a general and agricultural education system; next to the general secondary education, there are around 20 technical and vocational schools that offer an agriculture-related education.

The Flemish RDP 2014-2020 is an instrument with a wide range of measures to stimulate and support the competitiveness and sustainability and one of these measures is related to EIP.

In this setting, the Flemish EIP-AGRI Service Point acts as an intermediary in the EIP-AGRI network to strengthen communication and cooperation between everyone who is interested in innovation in agriculture. Representatives of the EIP-AGRI in Flanders are working at the Flemish Ministry of Agriculture and Fisheries.

The call for the OG is based around the two main themes of the regional government: Conservation Objective / Programmatic Approach Nitrogen (IHD / PAS) but can also be based on other topics relevant for the aims of the EIP-AGRI for agricultural productivity and sustainability. Moreover, the complementarity with existing innovative initiatives must be made clear within each OG and each OG should also examine whether knowledge on the subject is present at the practical centers of the Institute for Agricultural and Fisheries Research, and how this knowledge is used. If the knowledge is not used, it must be thoroughly justified by the OGs.

Within the available Flemish rural development budget, at least five OGs can be selected for financial support. All submitted projects will be evaluated by a committee of experts and the maximum grant per OG is € 30,000. The first call is foreseen from September the 1st, 2016 onwards and at the latest on 1st of December 2016, but the Flemish government will launch several calls during the program period.

Flemish EIP network that is supporting the creation of such OGs is accessible via the Flemish Rural Network that is located in Brussels. While the Flemish Land Agency (FLA) is the 'Service Point' thereof. The FLA is an External Autonomous Agency part of the policy area Environment, Nature and Energy of the Flemish government. Rural development, countryside and minerals policy, Manure Bank and Project Realization are the core divisions of the FLA. In addition to its headquarters in Brussels, FLA has two regional divisions: Western Region, with offices in Ghent and Bruges; and Eastern region, with offices in Leuven, Hasselt and Herentals.

Additionally, the Platform for Agricultural Research - Agrolink Flanders functions as a stage for the local Innovation Brokers working towards implementation of the EIP strategy. In fact, Agrolink Flanders wants to be recognized contact point for the agro-industry, research community and policy in agriculture and horticulture. It is the main Flemish forum for consultation and agreements between agricultural research and innovative agricultural actors in order to encourage their entrepreneurship. The platform represents a partnership between 17 Flemish universities and knowledge institutions.

Table 1 - Comparative table of EIP Models

	Management	Coordination	EIP within the RDP	Management of OGs	Funding of OGs	Role of extension/advisory services
the Netherlands	EIP framed within the national RDP but the interpretation and implementation of objective happens at the regional (provincial) level.	EIP National Service Point in cooperation with the National Rural Network, which will host the OGs within its platform.	Funds reserved but co-finance is require at the local level.	Framed at the local (provincial level) level and supported and by the national EIP Service Point.	Funding comes from the national RDP but has to be co-financed at the regional level.	Support, evaluate and judge plans. Besides setting up of a help team and national coordination of innovation broker networks database.
Belgium (Flanders)	Regional management due to the national state formation at federal level.	Rural Network Flanders and the Ministry of Agriculture are taking place of the EIP strategy implementation at regional Flemish level	EIP is framed within the Flemish RDP, which follows the EU prescriptions for the RDP and CAP.	The OGs are managed at the local level and have to report to the Flemish Ministry of Agriculture. Besides, the OGs have to be integrated into existing AKIS system.	There is regional Flemish budget to finance a fixed number of OGs with funds from the national RDP	These have to actively participate in the support of innovative processes and setting up of research projects. Also knowledge transfer and brokerage are important tasks.
Poland	National, central coordination and management	Coordination at national level; the agricultural advisory centre (SIR) coordinate EIP and I-B	Measure 16 and 1 of the national RDP	The central office do the activity of brokerage (makes actors connect, discover innovative ideas, help on project drafting etc)	OGs will be funded by measure 16 of the national RDP	Central role and involvement. The agricultural advisory centre coordinate both I-B and the networking.
Schleswig-Holstein	Regional coordination under national guidelines	Coordination at regional level; there is an EIP Office (EIP-Agrar) that coordinate OG and play the role of I-B (centralized by the office)	First OG born before the RDP 2014-2020.	The central office do the activity of brokerage (make actors connect, discover innovative idea, help on project drafting etc)	As first OG were born before the RDP 2014-2020, they were funded with other regional funds. Conversely, the second call for OGs will be managed under the regional RDP.	Central role and involvement. The office collaborate with advisors (the chief of the office is an advisor too)

Veneto	Regional coordination under a national framework.	Absence of a central office, The strong position of a Regional Agency in coordinating activities has to be underlined.	EIP is mainly ruled within the regional RDP.	OG will be managed within the regional RDP. The Regional Agency assume the role of coordination of I-B	OG will be funded through a package of measures (16, 1 and 2). Two separate calls for the setting up of the groups and for project funding	The Regional Agency will support OG both for the setting up and project building; the role of advisory services in these phases is not specified.
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4. Discussion

The results of our research, although they only include five examples, show different models of implementation of the EIP: despite the common guidelines provided by European legislation, it is clear that regions/countries can adopt different strategies, also in relation to their internal organization. Hence, in this section we will examine some key elements of EIP implementation as described in table 1, underlining the main peculiarities of each element and, where present, the barriers or difficulties characterizing the different approaches.

4.1 Management and coordination of the EIP

The scale of the EIP system is strongly dependent on the form of administrative organization of different countries and the EIP implementation is managed both at national and regional levels with different intensity of centrality.

All member states we analyzed have defined national guidelines for EIP implementation but the practical management and the definition of an operational strategy is in most cases entrusted to the sub-government levels: for example, in Italy the regions are the ones who organize the implementation, in the Netherlands the provinces. One example of completely centralized management is Poland: there is a national strategy for EIP, which is managed by the government and the national advisory centre.

Almost all countries decided to set up a coordination offices for the EIP. In other cases, within existing governmental/state organizations specific contact persons have been identified who are in charge of the coordination of EIP, for example in Belgium.

In some cases such as for example in Schleswig-Holstein the office is working on the EIP Service Point model installed in Brussels, by providing different kinds of support for establishing OGs such as networking, innovation brokerage, helping with project drafting, etc. These offices are coordinated nationally or regionally, according to the implementation modality chosen for the EIP. Essential for the right functioning of the system is the coordination among the different organizations involved: according to most of people we interviewed, coordination in the governance of the EIP is often a critical point.

4.2 EIP and Rural Development: management and funding of OGs

In each region/country EIP is framed under the national or regional RDP, which follows the EU prescriptions. With the only exception of Schleswig-Holstein region, which funded the first 17 OGs with other EU funds, in all region/countries the groups will be mostly funded under measure 16 of

the RDP, although a co-financing is planned in some cases (i.e Belgium and the Netherlands). Most regions and countries identified some innovation priorities for their agricultural sector and the activities of OGs will be framed within these topics; in most cases these priorities reflect those of the Rural Development and of the EIP strategy. A different approach was followed by Veneto Region, which chose not to identify any innovation priority in order to favour the bottom-up approach and open innovation processes; according to the Veneto regional government, the identification of specific priorities would have influenced the project proposals, the composition of OGs and would have favoured some agricultural sectors respect to others. The Rural Development rules allow both the funding of the group's setting up and of the projects implementation phase. In this regard, in the cases analyzed, we found different operating modes. In some case there are singular public calls which will fund both the setting up of the OGs and the projects; in other cases there will be two separate calls, one for the setting up and the other for the realization of the projects. One commonality among all the cases is the planned duration of projects (at least three years) and the total amount of money for each OGs (ranging from 30.000 to 50.000 euro).

4.3 EIP and support services

The role of extension/advisory services in the EIP implementation appear to be crucial in the different phases of the implementation of EIP strategy. In most cases, extension/advisory organizations are directly involved in the coordination of innovation brokerage activities, in helping those who are interested in OGs to find partners and building of a project together. Moreover, they will support managing authorities during the process of selection and evaluation of the OGs and projects. In Veneto, where there are no a public extension and advisory services, these functions will be performed by the Regional Agency for Innovation in the primary sector (Veneto Agriculture). These activities will be mostly funded with RDP – technical assistance funds.

According to the cases analyzed, we can observe a general tendency to centralize the innovation brokerage activities, involving directly advisory organizations both in coordination and operational actions. The centralization of such actions guarantees the institutional acknowledgment of the role of the advisory organizations as important innovation facilitators and brokers. To make this system work well, there should be a strong coordination and communication flow between the central offices and those ones placed and embedded in the territory.

5. Conclusions

The EIP for agricultural productivity and sustainability, can represent a useful tool for a better understanding of applied innovation processes. Our preliminary analysis of some of the EIP implementation modalities, confirms that the role of people and organizations able to catalyze innovation through bringing together of actors and facilitating their interaction is growing in importance.

Comparing the different models of the EIP we can stress the engagement of regional and national governments in transposing this new European approach to innovation in agriculture; also the involvement of support services in the designing of the strategy underlines the willingness to cooperate in order to achieve a more coordinated innovation support system.

European countries are starting now to experience the EIP implementation and more time is needed in order to understand if the adopted strategies will bring to the desired outcome. However, this preliminary analysis allow us to understand how different regions and countries interpreted the interactive innovation approach within the EIP and this represent a starting point for further research and insights.

The development of innovation support services requires continued local experimentation, adaptation and learning (Klerkx, Hall and Leewis 2009). Such innovation support services are an integral part of the AIS (Klerkxs, Aarts and Leewis 2010; Faure, Rebuffel and Violas 2011) and, to achieve the desired institutional change, there is the need to overcome barriers or gaps that can hinder collaboration (Österle et al. 2016).

Together and within the EIP other tools enabling dialogue and effective collaboration should be encouraged. For example, under the frame of AgriSPIN activities, a so-called a “Multiplier Group” will be established, whose members will be European regions’ managing authorities and advisory organizations; the aim of this Multiplier Group is to provide advice on how to better assure the uptake of the interactive innovation approach in European agricultural support services. One of the task of the Group is to improve national and regional innovation support services within RDP and to suggest possible new operational schemes for the implementation of the EIP.

The Project progress could add more insights to address EIP, foster its operational translation in european countries and encourage the overcoming of institutional barriers to innovation uptake.

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