



Member States (MS) AKIS implementing tools to bridge the gap between research and practice

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The overall objective of CASA, a Coordination and Support Action (CSA), is a **consolidated common agricultural and wider bioeconomy research agenda** within the European Research Area.

CASA will achieve this by bringing the Standing Committee on Agricultural Research (SCAR), which has already contributed significantly to this objective in the past, to the next level of performance as a research policy think tank. CASA will efficiently strengthen the strengths and compensate for the insufficiencies of SCAR and thus help it evolve further into “SCAR plus”.

Methodology

The study approach consisted of an analysis of the presentations prepared for the SCAR SWG AKIS meeting held in Dublin on April 16th and 17th oriented have insights on the Member States “Plans for enhancing knowledge flows and links between research and practice in future AKIS”, followed by a detailed questionnaire developed in close collaboration with the SCAR AKIS management team as delegated commissioner of the study. A draft questionnaire was presented and discussed at the SWG SCAR AKIS meeting in Dublin in April 2019.

The final questionnaire comprises of 38 open and closed questions organised in four sections:

- 1.-AKIS settings in the MMS
- 2.-Future strategic development of AKIS
- 3.-Improvement of the integrated approach within the European AKIS and implementation of the EIP-Agri.
- 4.-Consideration of challenges and future changes in relation to EU R+I framework program Horizon Europe and the interlinkages with CAP policy.

Which was sent out to 20 EU member states in April 2019, just after the SCAR SWG AKIS held in Dublin.

It was also considered a question on AKIS actors interactions where it was requested to provide a grade for the interactions among the different identified relevant actors. It was proposed to provide the scores based on a proposal collected from TEAGASC: 4-5 where there was a lot of interaction, MOU's, joint programmes and activities, service contracts, formal collaborations (e.g.: EIP-Agri OG's), and evidence of data and information sharing on a routine basis; 1-2 where there was no history of regular formal engagement, only ad-hoc and infrequent collaboration or engagement. They generally relied on third party access to information, e.g. print media or social media.

The preliminary results were discussed during the SCAR SWG AKIS held in Acireale (Italy) on June 17th and 18th 2019, and supporting desk research with the analysis of existing literature and more recent developments on AKIS.

Results

The process for AKIS strategic planning for the CAP programming period 2021-2027 is challenging the Member States to improve their knowledge on how AKIS are and how to better integrate the different actors to enhance the knowledge flows.

Since the starting point for the development of the EIP-Agri from both H2020 and the EAFRD programs in the EU countries and regions, it has been seen the evidence that AKIS have move forward. Even those countries with well-structured AKIS have also take advantage of this initiative to promote changes to improve their systems. And in those countries and regions were AKIS were limited structured they have started to work in this direction.

The roles of impartial advisory services in the future enhancement of knowledge flows within AKIS are seen very relevant and there is a need to defining impartiality, accreditation and training that future strategic plans should cover. Enhancement of networking between private and public advisors should be addressed.

This study is contributing to this strategic planning process by providing insights on how the situation is along the different countries and allowing to learn from experiences from one country/region to another, which is one of the assets for building a stronger EU AKIS to contribute to develop a more competitive and sustainable agriculture in the EU.

Background

The term 'Agricultural Knowledge and Innovation System" (AKIS) describes the exchange of knowledge, the institutional infrastructure with its incentives, and the budgetary mechanisms that support these exchanges in the agri-food sector. We define an AKIS as a system that links

people and organizations to promote mutual learning, generate, share and use knowledge, information and technology related to agriculture.

The components of an AKIS are all those private, public and non-profit actors that are related to the agri-food sector. In addition to the farmers, as central actors of the AKIS, the extension system with its components stands out: impartial agricultural advice (public and private), education and research. Other actors in the food chain directly influence farmers' decision-making and innovations (PRO-AKIS and SCAR SWG AKIS).

The AKIS vary among countries, regions and sectors; however there is no guarantee that they can respond to the challenges posed by the need to increase productivity and sustainability in agriculture and food production.

The first report of the AKIS Strategic Working Group of the SCAR committee showed eight conclusions about the AKIS in Europe, which were subsequently reinforced by different analyzes of the AKIS in the EU carried out by the Pro-AKIS and Print projects. Among those conclusions were found:

- AKIS was originally a theoretical concept (based on observations) that is relevant to describe national or regional AKIS
- The AKIS are quite different between countries and / or regions;
- Some countries have restructured their AKIS considerably;
- The components of AKIS are governed by different incentives;
- The AKIS are governed by public policies, but there are no consistent AKIS policies;

In relation to this last point, the European Commission has been working in recent years with the Member States and regions and organizations representing the sector for the development of consistent policies of AKIS, both within the SCAR SWG AKIS Working Group, and supporting various research and innovation projects, such as those already mentioned Pro-AKIS and IMPRESA, and more recently H2020 Multiactor approach projects related like AGRILINK, NEFERTITI and LIAISON and the 33 Thematic Networks.

Policy Context

The process for the new CAP programming period started in Nov. 2017 when the European Commission published its Communication of the European Commission on the future of food and agriculture (COM (2017) 713 final).

This meeting had been raised as a first reaction of the SCAR SWG AKIS as "Think tank", to this Communication which was particularly important since the text of the communication established the base ground for the future development of the CAP legal proposal for the period 2021-2027. And also given the importance that has the EIP-Agri and the strengthening of knowledge and innovation systems (AKIS) in the aforementioned communication, where it was stated: "...The European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI) and the European Innovation Partnership on Water have proven their value in mobilizing the agricultural sector for innovation. It has funded multi-participant pilot projects and is networking across Europe to make new knowledge generally available. Its success depends on the combined performance of advisors, agricultural training and educational systems, researchers and farmer organizations often referred to as the Agricultural Knowledge and Innovation System (AKIS) – which operates very differently from one Member States to another. The role of the farm advisor stands out as particularly important. A modern CAP should support the strengthening of farm advisory services within the AKIS systems. This should become a condition for the approval of CAP Strategic Plans".

In this sense, this group has been able to contribute in the past and currently, in the identification and implementation of instruments for the development of the EIP-Agri as it is configured now, within the framework for strengthening the AKIS through the interactive innovation model. In the current period the SCAR SWG AKIS group has published two "policy briefs" connected to the CAP

proposal, which have influenced the text of the communication. One regards “Strengthening the services of advice” and the other is on “The future of agricultural education systems in Europe”. In this sense, the meeting and the work of the AKIS group was proposed as a change to a more active way of designing the PAC-AKIS plans of Member States.

Furthermore the regulation for the future CAP 2021-2027, was presented by the EC last June 2018, which contains a cross-cutting objective (Art.5) that seeks the modernization of the sector through the promotion of knowledge, innovation and the digitization of agriculture and rural areas.

And specifically, in its Article 102-Modernization, it is established that "The description of the elements that guarantee the modernization of the CAP referred to in Article 95, paragraph 1, letter g), will emphasize the elements of the strategic plan of the CAP to support the modernization of the agricultural sector and the CAP, and should contain, in particular:

a) an overview of how the CAP's strategic plan will contribute to the overall cross-cutting objective of the incentive and sharing of knowledge, innovation and digitization, as well as the promotion of its adoption, as established in Article 5 , second paragraph, in particular through:

i) a description of the organizational configuration of the AKIS, understood as the whole of the organization and the transmission of knowledge among people, organizations and institutions that use and produce the latter for use in agriculture and related fields;

ii) a description of how the advisory services referred to in Article 13, the research and the CAP networks will work together in the framework of the AKIS, and how the advisory and innovation support services are provided ".

This study contribute to the common understanding of this new delivery process for CAP programming in the EU member states with a special focus on AKIS plans and the role of impartial advisory services to contribute to bridge research and practice.

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Chapter 1. Developments on Futureproofing AKIS in the EU

I. The Case Studies

AT: Austria

The national Austrian AKIS can be characterised as well integrated with a little number of actors involved (e.g. the Chamber of Agriculture, including their training service, organic farmers' organization, etc.) who cooperate well. Knowledge does flow in Austria, but rather slowly. The AKIS is dependent on public funding. The main changes for the AKIS will be to stimulate less bureaucracy, to organize higher interconnectivity between measures/interventions (e.g. information and advisory services, to organize cross-linking trainings (with focus on basic information followed by training for more in-depth individual advice) and improving the network between advisory services and researchers.

The main barriers and bottlenecks hindering knowledge flows in the AKIS are due to a lack of interconnectivity between measures and limited possibilities and resources for transferring existing excellent research results into practice. Knowledge transfer organizations should be organized in a more target oriented manner. There is limited capacity to engage in or connect to international projects. Projects and initiatives often work in parallel from each other without connecting and there is no systematic coordination to fine-tune practical needs with research activities (between research facilities, advisory service and agriculture).

To overcome these barriers, knowledge transfer organizations like chambers of agriculture should be better supported to proactively engage in research activities to be able to transfer and disseminate new knowledge to be used in practice. Furthermore, the interconnectivity between measures should be improved to seed-fund R&I project developments and engagements, using networks and clusters to improve coordination and communication. It comes down to organizing a bottom-up approach and better coordination of relevant research activities. On 13 May 2019, a kick-off event introduced the discussion and development of the Austrian Strategic AKIS Plan.

Cooperation and sharing of knowledge will be improved by enabling and supporting advisory services, to take up a coordinating role. The plan is to implement a national platform, led by advisory services, in which all relevant actors interact, identify needs and define projects together to steer the further development of AKIS. This platform shall be subdivided in focus groups on thematic level (by making use of already existing cooperatives). The further developments of advisory services, knowledge flows and innovation support will be organized as before, but shall be better coordinated on an institutional basis, including the innovation broker of EIP-AGRI.

It is still too early to describe the main CAP interventions planned for the national AKIS. The intention is to keep the wide diversity of AKIS-related interventions/measures but to improve the interconnectivity as mentioned above and set up own rules. To summarize, knowledge flows and strengthening the links between research and practice could be enhanced by using more measures in EIP-AGRI than in the current period (concerning M16, M1 and M2), as well as providing more seed-funding for R&I project developments and engagement as stressed before. Furthermore, knowledge transfer organizations could be better supported to proactively transfer new knowledge ready and available for practice (M1, M2). Farm advisory services could be strengthened within the AKIS by its funding (M2 + national funds) without a tender system and by improving the interconnectivity between themes to achieve a holistic advisory approach. Interactive innovation could be enhanced by the means of EIP-AGRI, the installation of an AKIS Platform, by making more use of open existing formats such as platforms and conferences for advisors and researchers, by organizing international exchanges between advisors (e.g. via IALB and/or EUFRAS) and by increasing and intensifying the further training of advisors and teachers/trainers. The digital transition in agriculture could be supported by the uptake of new technologies as a focus area across all related CAP measures (M1, M2, M16, etc.) and in particular by the digitization cluster (M16). Finally, demonstration farms could be set up to support digital agriculture.

BE: Belgium – Flanders

The Belgian AKIS is characterised by an open knowledge system, including private co-financing. Knowledge flows are organized as efficiently as possible by different instruments and support for different stages of the innovation process. Weaknesses in the system are a lack of connections between adjacent networks and governments and insufficient follow-up of knowledge results in the different stages of the innovation process, due to lacking knowledge flows between different actors involved, and there is a lack of long-term solutions beyond research projects' time spans. The main AKIS actors are the 2 public universities, 1 major applied research institute (ILVO), 12 experimental stations (between applied research and advice to farmer), advisory services (mostly private), 3 main farmers' associations, the Flemish Government (Flanders Innovation and Entrepreneurship (VLAIO) and the Department of Agriculture and Fisheries. Knowledge flows are stimulated by the networks connecting different AKIS-actors (the Platform for Research, Agrolink, the Platform for Research sustainable fertilization, the Coordination Centre of Biological Production, the Pigs Counter, the Cattle Counter, CCBT, Techno-pool Ornamentals, etc.). There are also many examples of collaboration between actors in joint R&D, dissemination of results and initiatives in which farmers are often involved (producer organizations, farmers' associations, etc.).

The main changes concerning the Flemish AKIS will be the effort on connecting networks, reducing redundancy and organizing better knowledge flows between different mechanisms. The main bottleneck hindering knowledge flows in the AKIS is, as stated above, a lack of strategies in order to have an efficient follow-up of the different stages in the innovation process. This bottleneck could be overcome by better alignment of different funding mechanisms, in order to foster synergies and to plan innovation implementation more efficiently (e.g. by good communication). Furthermore, better cooperation between the different funding agencies could be stimulated by better linkages with other policies (e.g. on the environment, animal welfare, etc.) to provide integrated solutions to farmers. Third, 'aftercare' for innovation projects could be (better) organized to better validate innovation, to be able to lay the burden of proof on the strongest shoulders and to ensure a long-term disposal of results. Fourth, a research agenda could be developed to identify the sector's needs and gaps, including resources focused on a manageable set of objectives, to increase impact and to balance top-down versus bottom-up initiatives.

To discuss the future of the AKIS and developments, a SWOT analysis on the CAP-AKIS-measures and proposals was executed for further improvements in the current CAP Plan and for the new CAP Plan. An AKIS-working group was formed (which is 1 of the 8 CAP working groups), consisting of 23 people from the ministerial Department of Agriculture and ILVO. They formulated a policy vision note in April and the group is working on the further elaboration of CAP-interventions (first results are expected in September). Furthermore, there will be a broad consultation with other ministries (e.g. the Ministry of Environment) and organizations (e.g. farmers' associations).

To enhance knowledge flows and to strengthen the links between research and practice targeted support for innovation and suitable instruments will be organized at every stage of the innovation process. Interventions will take into account the needs of companies, focused on specific target groups and objectives, e.g. young farmers, innovators and farms without a successor. These will be simple and rational structures and instruments with quick and easy procedures to reduce administrative burden and easily accessible for farmers (adapted to the target group). The links with CAP interventions will be related to 1) the EIP-operational groups (concerning low-threshold communication to farmers and continuous calls for proposals), 2) demonstration of already proven sustainable practices to spread (research) results, 3) farmers' support for innovative investments and dissemination of results, 4) vocational training and new forms of learning to reach a broader audience and intermediaries (such as e-learning, blended learning, podcasts etc.) and 5) the farm advisory system for more focus on advice for real innovations. With regard to

strengthening the farm advisory services within the AKIS, consolidated advice will be organized with different advisors from different angles (multidisciplinary, as a coaching formula for farmers). Furthermore, trainings of advisory services will be organized with particular focus on involvement in operational groups. Interactive innovation will be strengthened by providing farmers with the right skills, not only technically but also in terms of networking and collaboration. Also, platforms will be stimulated which bring together farmers and other actors for meet & greet initiatives between farmers and researchers. Finally there will be specific attention for European cooperation in interactive innovation. Digital transition in agriculture will be supported by the development of a central platform for storing and using data and support for data applications.

BG: Bulgaria

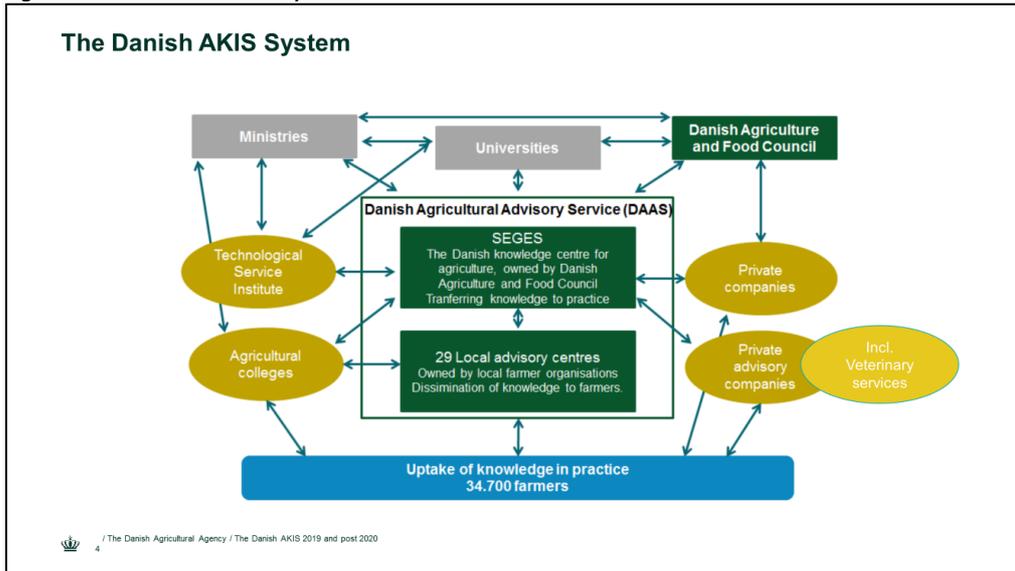
Although the AKIS is considered to be well organised in a formal way, the cooperation among AKIS actors in the public sector is considered as formally weak because of internal dependencies. The linkages between the other AKIS actors are also considered weak and mostly informal. The transfer of information and knowledge in the public sector is rather complicated and insufficient in reaching farmers but it does work better among involved associations, research institutes and universities. The main actors in the Bulgarian AKIS are: 1) the public sector, including the Ministry of agriculture, food and forestry (MAFF) and its secondary structures, among them, the National Agricultural Advisory Services (NAAS) and Agricultural Academy (AA) and the National Rural Network, 2) professional organizations (associations) and NGOs for a better transfer of knowledge and information to the farmers, 3) the private sector, including private advisory services, international trade organizations and regional suppliers which mainly work with large farms and 4) research and education through the Agricultural University and research institutes. The NAAS is the main supplier of information, knowledge and innovation to small-scale and semi-subsistent farmers. Professional associations have strong linkages among each other and their members. The main clients of the private advisory sector and international trade organizations are the large commercial farmers for the transfer of new technologies in their agricultural practice. Research and education are the main suppliers of new knowledge and new information to farmers. The Ministry often retains control over local decisions and this may decrease the quality of services delivered by public advisory providers to farmers. Often, experienced consultants from the public advisory sector migrate to the private system. In general, farmers and in particular SMEs, lack the capacity (in knowledge, training, contacts, etc.) to innovate.

One main change in renewing the AKIS concerning the agricultural research institutes in particular, is to better link the respective research projects to the end-users' needs and to increase collaboration between the research institutes. Second, the research institutes should be better involved in networks for dissemination of knowledge and consultancy services.

Regarding renewing the AKIS concerning interactions and knowledge transfer among the AKIS actors, the farmers' access to knowledge and innovations through demonstration activities should be increased.

Furthermore, various platforms for knowledge transfer among the AKIS actors, including event matching and networking sessions, and public and private consultancy expertise on interactive innovation partnerships, should be developed. Renewing the AKIS concerning agricultural policy, the funding of research in agriculture in national research and innovation policies (within the National Roadmap for Research and others) and strategic documents should be prioritized, including the misappropriation of public funds. Second, the interactive innovation culture should be (further) developed through the implementation of measures stimulating interactive innovation partnerships.

Figure 2: The Danish AKIS system



Source: presentation SWG SCAR AKIS IV plenary meeting, Dublin, April 2019.

National funding mechanisms finance collaborative research and innovation. There are no apparent bottlenecks hindering knowledge flows. Possible future CAP interventions are to build further on the national system (there is limited scope for specific interventions) to strengthen farm advisory services, links between research and practice and interactive innovation. Denmark wants to continue its national funding focused on fostering collaborative research and support digital transition by subsidizing investments for implementing new technologies at farm level. The key questions which are still under discussion concern 1) the role of the CAP networks within the Danish AKIS and 2) the need or request for CAP-funding for the OGs, which might inflict additional administrative costs/burdens.

EE: Estonia

The Estonian AKIS is characterised by the following strengths. The system functions well because of certified advisors who provide individual advice to researchers in field days and because of several measures supporting the AKIS. Knowledge transfer and dissemination is related to increased innovation cooperation as well as to research projects. Digitization provides more and various options for knowledge transfer formats (by online participation). Weaknesses in the system are among others the rigidity and restraint advisory system (in the case of state supported advice) such as limits as to who can render the advisory services. Second, there is a lack of continuity possibilities because of ageing among farmers. Third, some thematic areas are not covered, including some specific areas (e.g. related to organic farming, animal husbandry and aquaculture), while other thematic areas in knowledge transfer/advisory services are not backed by research support (e.g. poultry). Fourth, external experts from other countries are seldom involved.

The main actors in the Estonian AKIS next to farmers are among others: advisors and the coordinators of supported advisory services, the Innovation Network, the knowledge transfer (long-term) programmes, the innovation clusters and EIP-Ogs and other actors involved. Researchers disseminate their research results through 'field days', webinars, etc. Furthermore, there are links with educational institutions such as vocational schools and universities. Knowledge flows are created by the development of new knowledge, knowledge transfer, knowledge transfer programmes, innovation cooperation, advisory services and training of advisors via the Innovation Network.

The main changes to improve the current AKIS, will be to organize the advisory system in a more holistic and more flexible way, to establish digital knowledge reservoirs, to include consumers in the target group of knowledge transfer and to stimulate more cooperation between advisors and the actors involved in innovation projects. The main barriers and bottlenecks hindering knowledge flows in the AKIS are: insufficient access to advisory services (thematic restrictions, target group restrictions), new generation of service providers, training of advisors, availability of advice on specific topics and the fact that new research results do not reach the monitoring authorities (referring to the quality of surveillance).

It is planned to overcome these barriers, first, by the further development of the thematic knowledge transfer long-term programmes (LTPs) which will be coordinated by the 'Mega-LTP'. Second, implementing digital solutions will improve access to latest knowledge. Third, access will be improved to the data gathered by the state and fourth, (more) possibilities for the professional development of advisors shall be organized. Diverse actions and discussions are being undertaken for the further developments of the Estonian AKIS. When devising the national Strategy for Agriculture and Fisheries, the SWOT and national interventions were discussed (2017-2018) which provided input for the SWOT analysis related to the CAP Strategic Plan. Finally, interventions will be described for each specific CAP objective.

Further developments of the AKIS will focus on improving cooperation and the sharing of knowledge by means of the innovation network as a link between the different AKIS actors and the Mega-LTP as a transdisciplinary LTP ('testing' at the end of this CAP period). Estonia is currently in the process of discussing possible interventions on how the AKIS will provide advice, knowledge flows and innovation support services in the future, for which flexibility is the main goal. Knowledge flows and strengthening the links between research and practice could be enhanced by continuing innovation cooperation within the Innovation Network and advisors in innovation projects. Farm advisory services within the AKIS could be strengthened by supporting and promoting a next generation of advisors, implementing digital solutions to ensure availability, access and better coverage in terms of topics and participation in innovation projects which will improve cooperation and trainings providing new knowledge. Interactive innovation has a solid foundation already, derived from the CAP 2014-2020 period. The support for innovation cooperation will be continued. Digital transition in agriculture could be supported by developing knowledge reservoirs, to store all information and other digital solutions for knowledge transfer.

ES: Spain

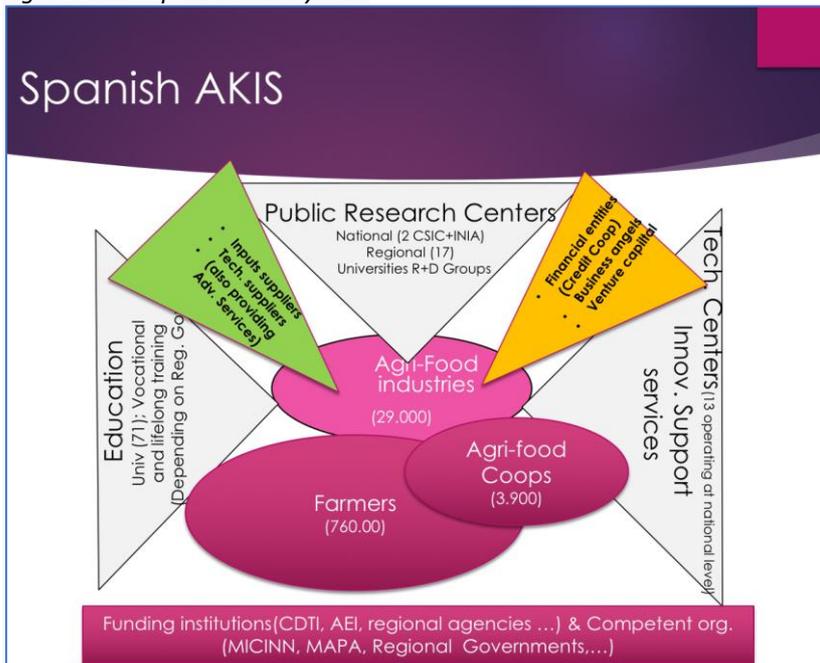
Spain has already started to analyse its AKIS characteristics, with a response from 5 regions. However, there is an evidence that shows that AKIS in Spain are fragmented and with different characteristics and relevant actors depending on the region.

The main AKIS actors are: farmers (including farmers organizations and cooperatives), advisors (in most of the regions Farmers Based Organizations-Cooperatives owned), training centres, technological centres, Universities, public administrations, input and service companies, agri-food industries, financial entities focused on agriculture and food value chain retailers.

The most relevant strong characteristics are the readily coordination structures among regions which function at national level. Some regions can share their knowledge to others which are less developed at particular fields.

A kick-off meeting has already taken place to take stock of relevant information and to discuss the governance, knowledge exchange, coordination and back office. Weak points are the fragmentation in the system because of regionalization, including the different evolution stages among the regions and the knowledge gaps between the research community and the farmers' needs.

Figure 3: The Spanish AKIS system



Source: Andrés Montero Aparicio

The plan is to promote actions addressing agreed shared challenges at both regional and national level, for better connections. Main barriers and bottlenecks are the gap between (the generation of) knowledge and the need for solutions in the farmer's practice. Important actors to include in the further development of the AKIS are technological start-ups, advisors and innovation brokers. The process of reshaping the AKIS in compliance with the new CAP, is still under development. In Catalonia the National Pact for the knowledge society and the Catalan Strategic Plan for Agri-food Research and Innovation and Knowledge Transfer (2021-2030), are discussing the Catalan developments and they are ready to embrace the Spanish Strategy.

The main change on the way of working for farm advisors will be a wider scope, focus on new technologies and further development of the FAS-network and innovation brokers. Specific effort will be put on changing the farmers' behavior towards smart farming, the links between farm advisors and the knowledge and technological development community, the uptake of technology and capacity building on digital skills, the use of platforms for knowledge flow and improving the involvement of the research community.

The main barriers and bottlenecks hindering knowledge flows are first of all, a lack of in-depth knowledge on the state of the art in AKIS, indicating the need to identify all actors involved (an AKIS mapping). Second, there is a lack of awareness of other actors' priorities, hence this calls for activities and cross-fertilizing meetings among different groups of actors. There is also a need for meetings within homogenous groups of actors to share challenges and experiences. A final barrier in the Spanish AKIS is the fact that community channels are relatively weak.

The development of the future CAP AKIS Strategic Plan, is still in progress. A Coordination Workshop for the Public Administration representatives involved in AKIS, was organized in February 2019. The aim was to create an open discussion forum and to form a collaborative working process for the exchange of experiences, consultations and alternatives, to improve the AKIS with the technicians of the Autonomous Communities and the National Ministry that will work on the characterization of the AKIS. Presentations were held on the AKIS concept and evolution, the AKIS approach within the CAP post 2020, on 'mini-AKIS' examples by the AGRILINK (h2020) project and Catalonian regional experiences were shared. This was followed by parallel discussions on the governance, knowledge exchange, the FAS and the back office organization of AKIS. Upcoming activities (in progress) are an internet forum of civil servants involved in AKIS and a National Focus Group on FAS within AKIS.

The main CAP interventions planned for the Spanish AKIS will be among others, linked to the National Digital Strategy for the agri-food, forest sectors and the rural areas. Linked to the Strategic AKIS Plan, the strategy aims at:

1. reducing the digital divide through connectivity technology (improvement and advisory within the sector on existing connectivity technologies) and training skills (through regulated and non-regulated education with focus on the youth and women);
2. supporting the use of data through improving interoperability (strengthening the collaboration among European initiatives e.g. FIWARE IOF2020 and promoting multi-regional projects based on solutions for data sharing by promoting national contests and EIP-Agri projects), focus on open data by the public administrations, research sectors, value chain and environmental data;
3. boosting enterprise development and new business models by strengthening the digital innovation system, advisory for the set-up of the AKIS approach applied for agri-food, forestry and rural territories and boosting new business models through the Platform for entrepreneurship in rural territories, public administration coordination for funding of entrepreneurship and the Smart Villages-Startup European Partnership.

FI: Finland

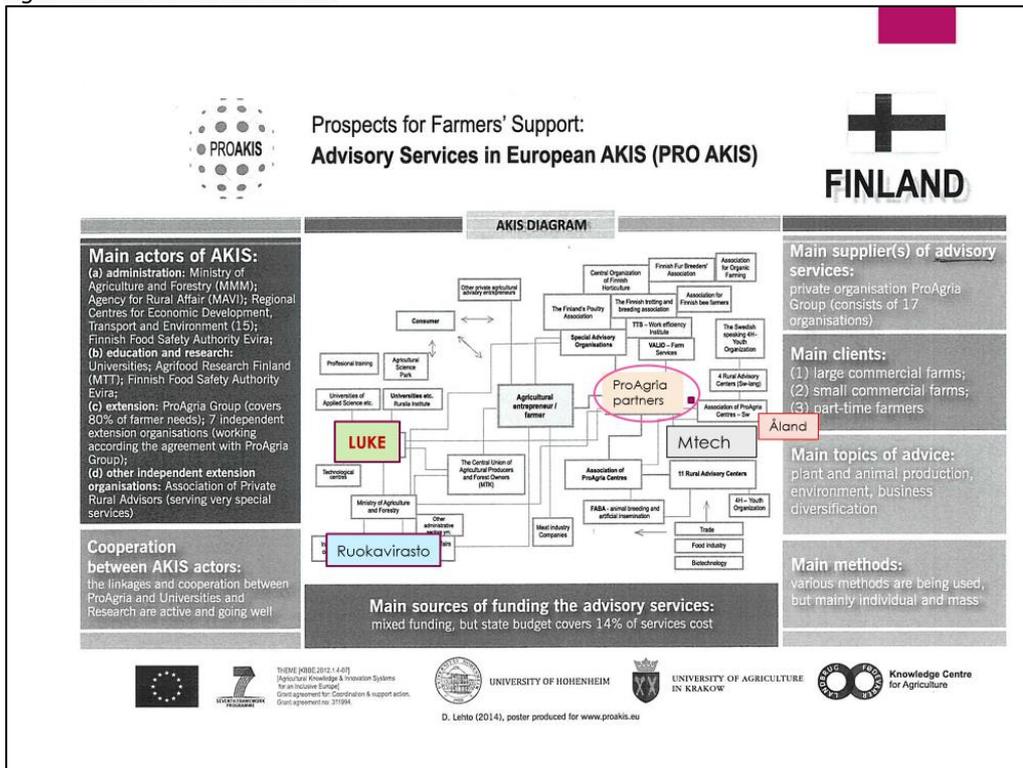
The Finnish AKIS is characterised as an interactive, differentiated, public and independent system. Farmers are well educated and skilled. Basic advice is provided almost for free. This is positive, however, there is the risk of the quality of the advices decreasing or becoming less valuable e.g. because of lacking competition (effortless). The challenge is to transform agricultural producers to agricultural entrepreneurs. See Figure 4.

The assessment of and feedback on the current AKIS is positive. No major changes are proposed. We would like more effort on knowledge flows, farm management and accounting such as a feedback mechanism on CAP measure 2 (M02 for knowledge exchange) is under construction. A bottleneck is the diminished resources of the university & research compared to the needs of new knowledge and skills in bigger farms. Private financing not much involved in open research. Finland wants to work on more determined, goal-oriented co-operation between all actors with more public-private and innovation oriented interaction. A series of 28 open workshops will be organized to develop the national strategic CAP-plan, several around AKIS activities. The big discussion will be on the poor profitability of farming for which knowledge is seen as a tool for better performance.

With regard to the organizational set-up of the AKIS to improve cooperation and the sharing of knowledge in an integrated manner, there will be no attempt for drastic changes. All AKIS actors are important, on national and regional level. The target will be to improve flows of info, data, needs and knowledge between all partners. Therefore, Finland will develop a common idea of priorities, goals, programming and commitment. Facilitators will make the connection between the actors involved.

Regarding the organization of advisory services, enhancing knowledge flows, innovation support services (cooperation, EIP, training, business development, etc.) much depends on the diminishing resources of EAFRD means in the next period. The technical aid will have scarcer resources also, leading to weaker administration, CAP network services etc. Structural funds are more oriented at cities and centres.

Figure 4: AKIS actors in Finland

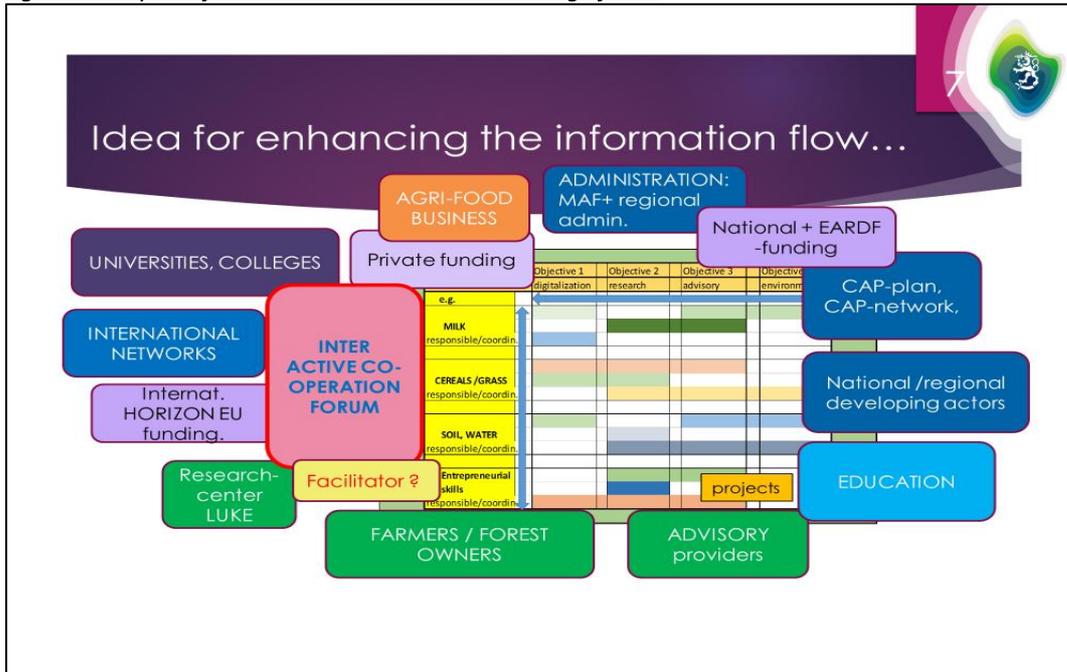


Source: PRO AKIS project, 2015 (SWG SCAR AKIS presentation, Dublin: April 15, 2019).

The main new CAP interventions planned for the Finnish national AKIS are as follows. To enhance knowledge flows and strengthening links between research and practice, a national innovation forum/platform will be developed to build new interactive cooperation between partners and public-private partners. The aim is to design R&D&I programmes and actions in a more integrated manner which avoids too fragmented, overlapping actions and projects under the CAP Plan. This concerns all development interventions and technical aid. To strengthen farm advisory services within the AKIS, the advisory scope will be widened through more training of the advisors. Finland also wants to enhance peer-to-peer knowledge exchange and dissemination between farmers. They will develop new web-based training methods (Art 72). To strengthen interactive innovation, more cross-fertilization will be stimulated between sectors and knowledge to enhance e.g. the bioeconomy. More attention will be given to brokerage (Art 71., there are approximately 700 projects now) and benchmarking of best practices in EIP. Finally, to support digital transition in agriculture, more targeted projects shall be initiated. All know the potential and the need of the leap, but the development is very scattered. E.g. new barns often include robotics but the connection between the data of the field processes and the feeding table work by pen, paper and calculator. There are also still lagging broadband connections in rural areas. Supporting the digital transition requires raining, co-operation and investments.

The strength of the French AKIS is first of all, that it is an organized and well-structured system. EIP AGRI has an excellent coverage of all territories. In general farmers are well educated and trained. Most advice is publicly available and there are many initiatives to foster the AKIS. The AKIS is organized at all levels in the country, from local, regional to national level. Weaknesses in the system are that there are not sufficient advisors skilled in innovation support. Second, the AKIS is a big and heavy system which makes it difficult to manoeuvre the system.

Figure 5: Proposal from Finland to enhance knowledge flows



Source: Presentation SCAR SWG AKIS meeting Dublin April 2019.

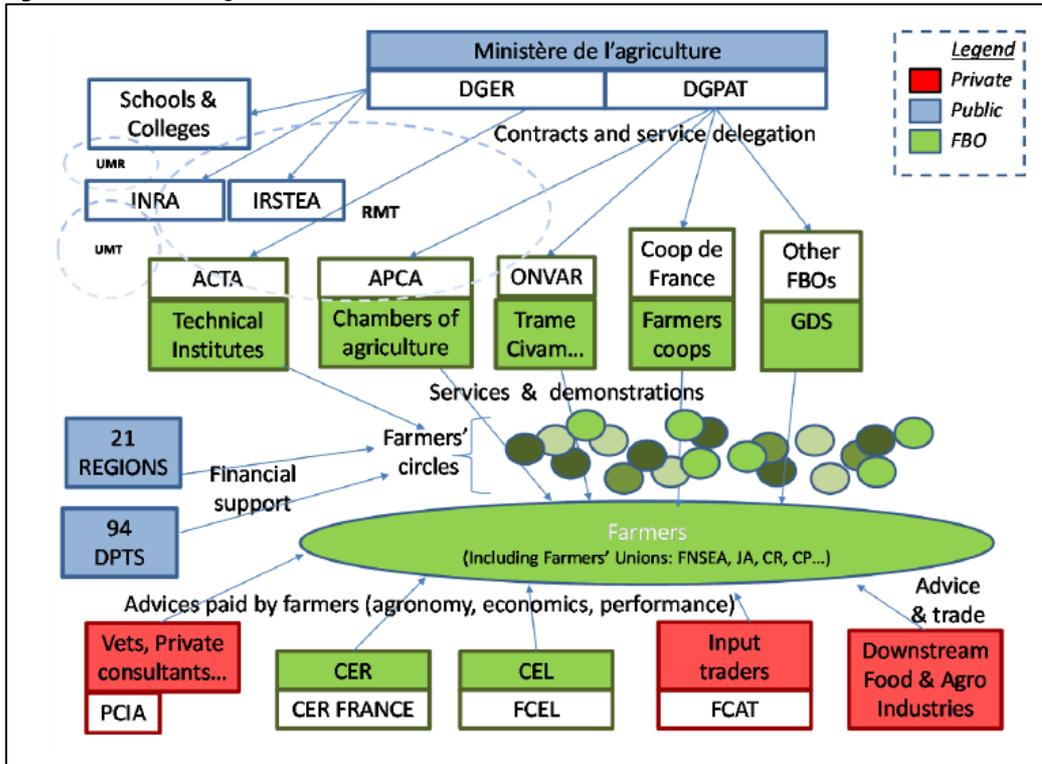
FR: France

Third, not all not all farmers are included in the AKIS and there are differences in the level of inclusiveness (some farmers benefit more from the AKIS than others). Fourth, although there are many toolboxes available, there is a lack of interoperability between the different mechanisms. Opportunities in the system are, first, the separation between the sales of agricultural technologies/products and agricultural advice. Second, the transition towards agro-ecology is leading to new opportunities and interactions. Third, the societal demand for more environmental friendly agri-products is increasing. Fourth, the support for AKIS by the State has improved. Fifth, there are different initiatives supporting improvements in the AKIS such as the 'Plan Enseigner à produire autrement' and the 'Law Egalim'. Threats to the systems have first of all to do with the fact that agricultural jobs are less and less attractive to the younger generation. Second, farmer's wages do not match with the level of their education. Third, agri-data (from farmers) are gathered and locked by big companies and digital companies. Fifth, there is a noticeable loss of the farmers' freedom / liberty in performing their job.

The main barriers and bottlenecks hindering knowledge flows in AKIS are the dissemination of knowledge which could be enhanced between all the different geographical levels in France, especially related to the diversity in terms of agriculture, culture and climate. This could be overcome by empowering innovation support services and to form a new structure of cross-cutting cultures, linking innovation, research and advice (e.g. Cellule RIT). Main changes in the AKIS will focus on finding more coherence (+ simplification) between national and EU policies and to encourage cross-border cooperation between different AKISs dealing with similar topics (to create win-win situations). Many instances are involved in the current discussion on the future of the AKIS (such as the consultative committee on EIP, the ministries, EGA and CTDAR CSO).

Cooperation and the sharing of knowledge will be improved by the further animation of EIP, enhancing connecting between different levels at EU, national and regional level and stimulating efficient linkages with and within the AKIS system (especially related to thematic networking).

Figure 6: The AKIS diagram in France



Source: the EU PROAKIS project (2015)¹.

Advice, knowledge flows and innovation support services will be provided and enhanced by the Platform RD Agri - Ecophyto PIC and Cellule RIT, providing coherence between different plans and toolboxes, etc. Furthermore, there will be more effort on involving the well-functioning French agri-teaching system in the AKIS.

Knowledge flows and strengthening links between research and practice in particular, will be enhanced by further efficiency and animation of the AKIS network. Farm advisory services within the AKIS will be strengthened by separating particular activities for advice and for sales. The CAP could support the independency of the advisory networks (e.g. on pesticides). Furthermore, farm advisory services will be strengthened by the implementation of the EGALIM law. Interactive innovation could be strengthened by the CAP Cooperation Measure and support for innovation networks. The digital transition in agriculture could be strengthened by supporting the capitalization of knowledge. The transition towards agro-ecological agriculture is supported by digital technologies. However, France is not in favor of digital technologies controlling and piloting agriculture and farms which rule out the human factor in agriculture.

HU: Hungary

Considered strengths of the Hungarian AKIS are:

- the establishment of a research network under the umbrella of the Ministry of Agriculture which main profile is applied R&I, with a diverse palette of topics;
- an RDI working group was set up which meets regularly to ensure basic knowledge flows between policy, research, the rural network and advice;
- a thematic unit and a subunit under the Hungarian Chamber of Agriculture which ensure knowledge transfer in thematic tissues;

¹ <http://proakis.webarchive.hutton.ac.uk/sites/www.proakis.eu/files/Country%20Report%20France%2010%2007%2014.pdf> : p.13.

- an accessible network of advisory service providers with 1300 transparent registered advisors;
- the BIOEAST initiative which mobilizes the national actors in thematic working groups and ad hoc meetings.

Considered weaknesses of the Hungarian AKIS are:

- that the main focus of advisory service is on administrative support while the emphasis on technological advice is low;
- no direct contact between the Ministry of Agriculture and agricultural universities;
- a too complicated call on the content for advisory services and EIP and its evaluation was delayed, which resulted in a loss of confidence which is now being experienced;
- unclear research topics for advisors and farmers;
- knowledge flows between RDI actors depend on a case-by-case basis;
- no national agricultural research strategy. The priorities and goals are not defined. There are no allocated financial resources to support agricultural research;
- the agricultural vocational training system is strongly short of resources;
- the EIP NSU cannot work properly because the department did not receive the necessary licenses for the activity.

Table 1 AKIS actors in Hungary

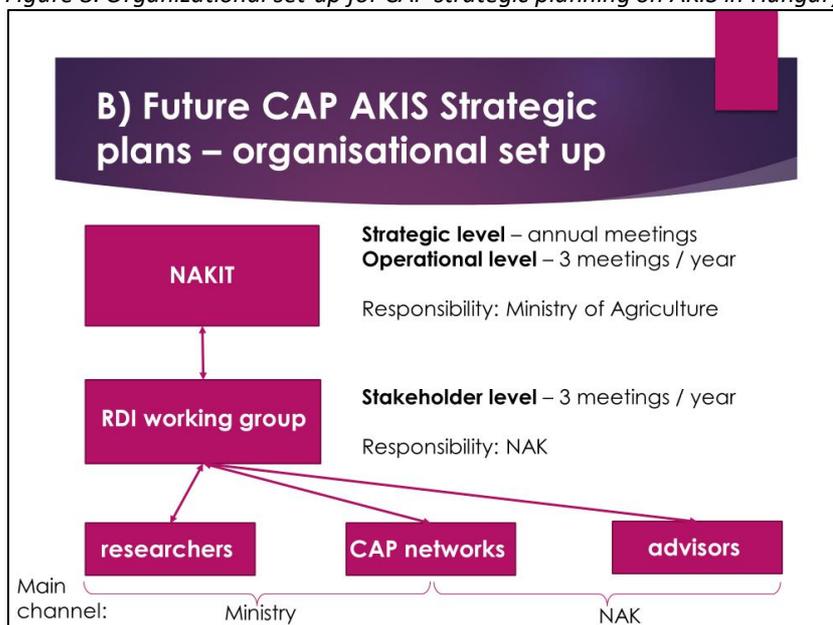
Levels	Main actors
Policy	<ul style="list-style-type: none"> ▪ Ministry of Agriculture ▪ Ministry of Innovation and Technology
research	<ul style="list-style-type: none"> ▪ National Agricultural Research and Innovation Center ▪ Hungarian Academy of Sciences ▪ Agricultural universities
education	<ul style="list-style-type: none"> ▪ Agricultural universities ▪ Agricultural vocational schools
advisory	<ul style="list-style-type: none"> ▪ Hungarian Chamber of Agriculture ▪ Advisory service providers
farming	<ul style="list-style-type: none"> ▪ Hungarian Chamber of Agriculture ▪ Farmers

The main changes in the AKIS compared to the current situation, will be:

- the establishment of NAKIT (National Agricultural Knowledge and Innovation Council) to ensure the transparency of research activities and results, determining research priorities which are in parallel with the need from practice and to ensure the knowledge flow from research to advisors and farmers;
- working out a more efficient EIP call and speeding up the evaluation process (based on the lessons learned from the 2014-2020 period);
- launching the evaluation system for advisors;
- formalizing advisory services provided by research institute;

An AKIS working group will be established to create a concept, write the plan and determine the rules for the Hungarian AKIS Plan. It will involve all relevant actors. The organizational set-up is shown in Figure 8.

Figure 8: Organizational set-up for CAP strategic planning on AKIS in Hungary.



Source: Presentation SWG AKIS meeting Dublin 2019.

Knowledge flows in the future CAP AKIS Strategic Plan shall be organized as follows (see table 2).

Table 2: Planned Knowledge flows' organization in Hungary

Actors	Provision of advice, knowledge flow, innovation support
Researchers	<ul style="list-style-type: none"> ▪ In each institute separate department for extension services (research and extension activities, so as the people in charge, are separated, but working close) ▪ Provision of demonstration activities to spread research results ▪ Research results are also fed into a country-wide, publicly available knowledge reservoir (KR)
Advisors	<ul style="list-style-type: none"> ▪ Service development due to better education, trainings, mentor program (shift from administrative advising) ▪ Efficient financing by a voucher system ▪ Good practices are fed into the KR
CAP networks	Main intermediary NAK: <ul style="list-style-type: none"> ▪ Enhancing information and knowledge flow (booklets, events, KR) ▪ Connecting providers-clients by making available expert lists, communicating existing services (demonstration, advisory)

The main new CAP interventions planned for the national AKIS are as follows. To enhance knowledge flows and strengthening links between research and practice will be stimulated through: (1) the establishment of NAKIT and using NAK as channel, (2) national supports for extension service of research institutes (3) complemented with formalized and regular meetings ,(4) reorganization of EIP and (5) strengthening the EIP NSU. Farm advisory services within the AKIS will be strengthened by a.o. (1) ensuring training possibilities and (2) empowering the formal relationships between advisors and researchers. Interactive innovation will be enhanced through demonstration farms for knowledge transfer and research implementation, (2) improving innovation aspects in national R&D resources and (3) rethinking the EIP call. Finally, the digital

transition in agriculture will be supported through demonstration farms for better practical knowledge transfer.

Strengthening the FAS within the AKIS is planned as follows (see Figure 9).

Figure 9: Strengthening the FAS within the AKIS in Hungary.

C) in focus: strengthen farm advisory services within the AKIS

- ▶ **What is needed:**
 - ▶ **Target those who need advisory service**, offer different means of support to others

FARMER categories	Means of support
Independently capable to solve problems	Provision of information on opportunities
Need advisors	High level advisory services
Don't want to do better , nor innovate	Stimulating activities

- ▶ **Each thematic field of advising is developed by different means**

Main thematic fields	Means to ENSURE HIGH-LEVEL ADVISORY
Administrations	Provision of information (events, brochures, helpdesk)
Business	Training for <i>holistic approach</i>
Production technology	Discussion groups ; include sustainability solutions
Innovation	Training for <i>innovation brokering</i> and <i>facilitation</i>

+ research results channel in; soft skill trainings; mentoring program for young advisors

- ▶ Farmers can get AKIS services in the frame of a **voucher system**

Presentation SCAR SWG AKIS Dublin April 2019.

IE: Ireland

The main strengths of the Irish AKIS is first, that it is a well-integrated research, advisory and vocational education system (Teagasc, Agency of the Agriculture and Food ministry). Second, there is good collaboration between the main actors in the AKIS through formal and informal structures. Third, there is a good farming press and media present through a variety of methods and sources. Fourth, there is strong government led support. The main weaknesses are first, a lack of meaningful one-to-one contact with some farmers and actors. Second, there should be scheme focused solutions around activities, rather than focus on results. Third, there is limited innovation brokering activity.

The main changes to implement a new AKIS compared to the current situation are first, that more work is needed to future proof innovation support activity (re- climate action), adapting to changing societal norms, etc. Second, results-driven support activities should be encouraged.

The main barriers and bottlenecks hindering the knowledge flows in AKIS is that there is still a lot of contradictory information, even from similar sources. It is hard to find (scientific) evidence based proof and to ensure that it is not driven by vested interests. The barriers will be overcome by an open dialogue and challenging of people from all sides of the issues. More awareness of environmental and animal welfare issues and actions will be created. In the process of discussion on the AKIS there is good attention to the AKIS in the FoodWise 2025 strategy and action plan. It is limited to date in the next plan related to the CAP post 2020, which has not been discussed much yet and needs more focused initiatives to improve the current situation.

The organizational set-up of the AKIS, and in particular advisory services as referred to in Article 13, research and CAP networks, will improve cooperation and the sharing of knowledge in an integrated manner because more than 50% of the farm advisory service provision comes from one public organization: Teagasc. The remainder comes from private consultancies and commercial companies. Teagasc concentrates on the technical and business support with comprehensive applied research and training programmes, servicing one third of farmers under

annual contracts. It impacts on all other advisory actors through the supply of technical information to media and specific outreach programmes e.g. ConnectEd. These private actors provide a variety of services outside of the scope of Teagasc. Regarding innovation support services, all advisors will deliver group based innovation support, targeted at specific challenges, sectors, locally led groups of farmers and the wider rural communities, using digital tools and services.

The main CAP interventions planned for the national AKIS regarding:

- enhancing knowledge flows and strengthening links between research and practice, would be to focus more on discussion groups around 'real problems in practice';
- strengthening farm advisory services within the AKIS (which is already strong in Ireland), will be to put more effort in avoiding 'fake news' and resisting over simplified solutions. Furthermore, the FAS will build on AKIS actions specified in FoodWise 2025;
- strengthening interactive innovation, will be to organize more Operational Groups (OGs) on a smaller scale, for solving local problems. A strong evaluation framework will be organized to ensure the sharing of learning across groups and to the broader AKIS;
- supporting digital transition in agriculture, will be to develop better advisory tools, which reduce the effort of farmers and advisors to assemble accurate data for decision-making, benchmarking and reporting on their farm.

IT: Italy

The analysis of the AKI System (context and SWOT) has not started yet in Italy. However, a discussion about the best methodology to be used to run this analysis was kicked off. Some initial thoughts can, nevertheless, be formulated, based on the work done over the years by CREA Policies and Bioeconomy and on the debate recently launched on this topic. The main characteristics of the Italian national are its complexity and fragmentation. The Italian AKIS is characterized by a high number of actors and activities. The number of actors and activities involved increased considerably in the past few years and this, combined with the lack of governance and coordination among them, contributed to the fragmentation of the system. In addition, the widespread use of participatory approaches in the implementation of research and innovation projects, increased the participation of both the main institutions and other actors but without a clear and defined strategy.

The existing knowledge of the main actors and activities of the AKIS can be considered advanced, even if some integration might be needed. New actors are likely to have become active in the system in the past years and they will need to be identified. The relations between actors and the presence of new functions, also require further investigation. Some AKIS actors, such as farmers, would benefit from a more thorough analysis, to better identify their needs in terms of innovation, also using financial and structural data. Professionals active within the AKIS are aware about the importance of using participatory tools but they are not necessarily able to use them properly or to select the most appropriate ones.

The main changes in the new AKIS Plan compared to the current situation should address the following challenges. One of the most serious issues appears to be fragmentation and this could be overcome by a more strategic policy intervention. The current RDP-funded interventions related to the AKIS are based on measures which have different implementation rules and this make it difficult to promote coordinated actions within the system. The approach of the new CAP might enable to solve this issue and allow for more systemic action. The completion of the context analysis, both at national and regional level, will help the more detailed thoughts about the required changes.

Regarding the bottlenecks and how to overcome them, knowledge will flow more easily if the policy intervention promotes the human capital growth (both for farmers and professionals) and supports the connections between AKIS actors.

The process of the discussion on AKIS is organized by the Ministry of Agricultural Policies and the regions, who are discussing which methodology should be used to run the context analysis of the AKIS. The main issues to decide upon are:

- the level at which the analysis should be performed (national, regional, or both);
- the minimum functions an AKIS should guarantee and the most effective ways to deliver them;
- which services are available, which are lacking and which are not available; which actors are already involved and which should be involved.

This analysis will be carried out with on-desk surveys and by direct contacts with some actors.

It is too early to identify the operational interventions for the Italian national AKIS. This depends on the political choices, which will be made by the European and Italian institutions in the near future. Based on the experience gained by CREA Policies and Bioeconomy in recent years, it will be essential to promote a coordinated strategy using all available tools (information, training, consultancy, EIP-AGRI, etc.) to promote the growth of AKIS as a system, which should also include innovation-related actions as envisaged in the Operational Programs.

If the objective of the new programming period is to coordinate and connect actions, knowledge and actors related to innovation in order to promote an effective systemic work, the fundamental question is how the strategy will be built. The question how agri-food and forestry sectors will be analysed becomes relevant e.g. if knowledge and innovation related policies address mainly small and medium holdings, it will be necessary to clearly identify their needs (with quantitative and qualitative indicators) and, based on them, to fine-tune the related interventions. Furthermore, it might be useful to highlight which AKIS functions are mainly considered of particular importance to be delivered by the system (and this might change depending on the region/rural area). And it would be good to understand which competences and skills actors have or will need to acquire with respect to the working methods introduced by the new regulation (interactivity, information exchange capacity, user's involvement, tailor-made advice, etc.). It is also necessary to organize meetings with the AKIS actors in a very open way, in order to bring in actors who are not part of the traditional system but who might have innovative skills and proposals to share. The construction of the final strategy will have to provide the possibility to identify priorities when planning innovation-related measures/operations, in order to make the available tools more focused and effective.

NL: The Netherlands

The Dutch agricultural sector is characterized as highly innovative and technologically advanced with a great deal of innovative activity, including start-ups and a strong SME. The OECD (2015) therefore characterises the Dutch agricultural knowledge and innovation system (AKIS) as a global forerunner in production-oriented technology and innovation processes, focused on input efficiency and sustainability.

The strength of the Dutch AKIS is due to a history of long-term public-private investments in 'the golden triangle', the collaboration between various knowledge institutions, the business community and governments, in consultation with societal parties. However, the AKIS is subject to changing dynamics of public and private wishes and requirements in the transition to sustainable circular agriculture. More and more attention is paid to cross-sectoral and transdisciplinary dilemmas related to the Dutch agri-food system. This also makes the AKIS a complex system. For example, there are various actors communicating different messages and

there is the logical tension between public and private interests. Important developments that influence the AKIS are:

- scaling up and intensification of agricultural holdings that ensure more private investments in knowledge and innovation (K&I) but also lead to a larger K&I gap between large and SMEs;
- the commercialization of knowledge as a public good into an international market product;
- a social shift in which generic knowledge and skills become at least as important as specific professional knowledge.

The EU FP7 PROAKIS project (Knierim et al., 2015) concluded that the Dutch system is fragmented but strong. This is due to the availability of sufficient resources and instruments to ensure that farmers and other AKIS actors have sufficient access to knowledge and innovation. The Netherlands can be considered an extreme example in which we speak of many small-scale AKIS subsystems within the various sectors and regions which meet the knowledge needs of specific farmers.

The main changes to be implemented in the strategic AKIS plan compared to the current situation are:

- a better vision on the AKIS' added value in the transition towards more circular sustainable agriculture;
- a better organization of the farm advisory system;
- to stimulate more knowledge flows between AKIS actors and implementing innovation at farm level;
- better connections between different actors in the AKIS system.

Main barriers and bottlenecks hindering knowledge flows in the AKIS are a lack of national coordination and a lack of connections between AKIS actors and organizations, plus incoherent financial means on regional and national level (38 mln. euro was available from the RDP in 2014-2020). Overcoming these bottlenecks depends on political choices in our national strategic plan, which is currently being developed and better linkages with the EIP Service Point regarding EIP related activities.

The process on developing the strategic AKIS plan is organized under the programming group of CAP-NSP. There is a special subgroup KIND (knowledge, innovation, networking and digitisation) working on the AKIS-CAP part. On May 23d a wide stakeholder meeting took place on (all of) the CAP elements with engagement from multiple actors such as the private advisors' association (VAB), primary producers and actors in the value chain (e.g. FrieslandCampina).

Cooperation and the sharing of knowledge in an integrated manner, will be improved by aiming at an interactive approach in which not only knowledge from researchers and advisors will play a dominant role but also the know-how of the farmers. Particular focus shall be on the coaching of young farmers. Innovation will be stimulated and supported by innovation brokerage, by bringing parties together, to coordinate more at national level and by giving specific financial support (vouchers). The provision of (independent) advice, stimulating knowledge flows and stimulating innovation support services are already being conducted but the idea is to give this a larger impulse in the NSP.

The main CAP interventions that are foreseen in the Dutch AKIS will be to stimulate the interaction between the FAS and researchers, to enhance knowledge flows and to strengthen links between research and practice and to organize living labs and demonstration projects. The strengthening of farm advisory services within the AKIS is under construction and will likely best supported by certification, organizing masterclass and vouchers. The strengthening of interactive innovation will a.o. be supported by enhancing local practical networks, EIP, training of advisors and masterclasses. Digital transition in agriculture will be supported by a.o. hackathons (on which there is good experience), support for creating apps and exchange of data.

PL: Poland

The main features of the Polish national AKIS are first of all, the fact that the system is based on multi-entity cooperation (by public and private agricultural advisors, farmers, scientific/research units, public administration, educational bodies, etc.). The individual units which make up the system have their background in specific technical capabilities. There are many interactions between different units such as within the Polish National Rural Network and the Network for Innovation in Agriculture, which are based in the competence building central unit CDR. There is a cross-sectoral nature of relationships and connections between the different sector entities in agriculture, food production (specifically small-scale and on-farm level) and rural development. Finally, the AKIS includes partners from both the public and private sector. Strengths of the AKIS are the fact that all involved bodies/entities benefit from participation and cooperation. The units are specialized which makes the system versatile with a whole range of different expertise. There is extensive experience in inter-sectorial and multi-entity cooperation which already has development potential. Finally, the system includes national and regional entities and therefore has knowledge of national, regional and local conditions, as well as national and local practical experience. The system includes a network of (16) reliable and impartial agricultural advisory services units which cover the entire country. Basic operations are financed through national funding including CDR. Furthermore, the AKIS includes an efficient network of innovation brokers which cover the entire country, a network of secondary agricultural schools and universities with high level knowledge and technology transfer centres.

Weaknesses, barriers and bottlenecks in the system have first of all to do with the administrative overload of public agricultural advisory units and additional ad hoc unplanned tasks, ordered by the government. Second, fragmentation of the system derives from different goals and interests by the actors involved. Third, there are certain weak links between units and insufficient cooperative habits. Fourth, strategic documents and a coherent financing system from public sources are not sufficiently developed. Fifth, there are insufficient incentives for innovative and investment activities, a shortage of field demonstration activities and to conduct implementation activities by scientific and research units. Finally, there is insufficient development of professional qualifications of agricultural advisors and a shortage of tools supporting advisers' work including dissemination and implementation activities.

To overcome these mentioned barriers, a financial system supporting the multi-entity approach will be introduced incentives will be developed for multi-actor cooperation, pro-innovative activities and the implementation of research results, as well as demonstration and dissemination activities. Furthermore, the role of farmers and farmer representation will be increased in the system, roles/mechanisms of networks will be defined functioning as tools for knowledge and innovation transfer and the catalyst role of agricultural advisory in the system will be strengthened.

The discussion on further development of the AKIS is under discussion. Regular meetings of thematic groups and working groups on specific AKIS themes are (being) organized, as well as regular meetings of stakeholders e.g. representatives of agricultural advisory and research institutes, in order to exchange updated information on recent developments and opportunities. Finally, (the renewal of) AKIS including multi-actor approaches and knowledge flows will be promoted at various events, e.g. forums, fairs, conferences, exhibitions and training courses. There will be particular focus on the further development of the Network for Innovation in Agriculture (SIR) embracing numerous partners who have the potential to contribute to improving flows of knowledge between science and agricultural practice. Projects from the Rural Development Program (Strategic Plan after 2020) will be financed, aiming at facilitating the exchange of information on innovative solutions (e.g. meetings or internships for advisers in research institutes, the organization of meetings and thematic conferences with the participation of scientists, advisers and farmers, organization of thematic meetings for advisors, organization

of study visits for advisors and farmers, production of movies and/or brochures promoting innovative solutions).

Innovation networks in agriculture and in rural areas will be developed to support the training of advisors and equipping them with appropriate tools, building personal and professional capacities of advisory services and provision of competence training for farmers and agricultural producers. Professional qualifications of advisors will be developed, by the means of postgraduate studies, an internship program in research institutes and experimental facilities, training programs for young advisors, specialist training courses for advisors and for the training of soft skills.

Regarding the application of digital solutions, plans are to:

- prepare and implement digital platforms to provide up-to-date relevant information and distant training services;
- develop digital tools, to support the work of advisors;
- build and maintain knowledge exchange platforms;
- introduce trainings on soft skills for researchers;
- implement vouchers for researchers to enable the development of new research based solutions, or other incentives to facilitate cooperation and the sharing of information about innovative solutions;
- organize trainings for agricultural school teachers on new methods and systems of agricultural production;
- support thematic group meetings with researchers, consultants/advisors and farmers;
- develop and disseminate the implementation of instructions or manuals on new/innovative practical solutions;
- provide advisory and training services for farmers, taking into account the wider use of distant training and consulting;
- broader implement training based demonstrations;
- support the cooperation between agricultural producers.

Planned interventions in the AKIS are to:

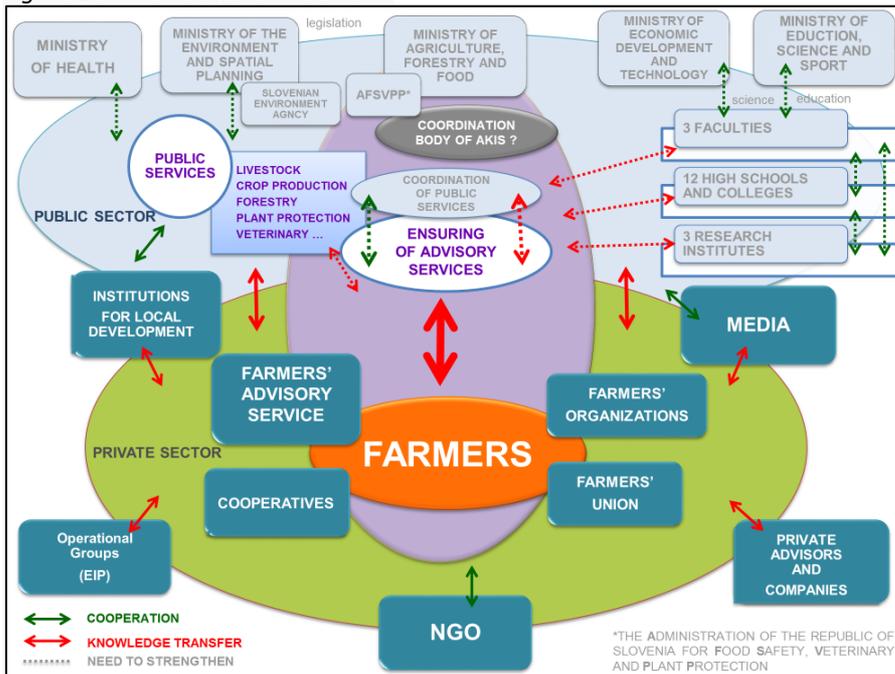
1. build a system of permanent, structural linkages between science/research and the agricultural advisory and farmer community, in order to improve the flow of information and innovative solutions for agricultural practices;
2. build the system on systematic meetings between scientists, advisors and the farming community in order to identify the beneficiary needs. Information flows should be organized to facilitate 2-way interactions. Farmers who express their problems should be supported by agricultural advisors who in their turn cooperate with scientists to come up with the best solutions. Advisors ought to provide farmers with knowledge about new solutions and innovations in a way which enables farmers to easily apply these solution in their daily practice;
3. build thematic groups of farmers in order to solve identified problems with the participation of advisors and researchers. The advisor acts as a facilitating group coordinator of thematic groups, to transmit knowledge. Farmers also have the opportunity to exchange information between them about gained experiences;
4. organize demonstrations to enhance the practical use of research results in practice (e.g. on demonstration farms);

5. organize systematic trainings for advisory staff members for developing a career path and raising competences in an organized manner and continuous updating of knowledge (lifelong learning). The acquiring of qualifications by advisers should not only be focused on substantive knowledge but also on soft skills;
6. provide tools to agricultural advisors, scientists and farmers who will facilitate the transfer of knowledge digital applications and the use of digitization and technical innovations to improve the work performance in agriculture (computer software and hardware, digital applications, internet access, knowledge transfer platforms, databases, etc.);
7. invest in assets and equipment for support on implementing innovations (which will not only be related to 'soft' activities);
8. make the financing of technical assistance projects more flexible and in line with current needs. The present system of implementing technical assistance is too complicated, too time-consuming and too inefficient;
9. strengthen and extend the Network for Innovation in Agriculture and its activities, among others by simplifications. Currently, too much time is spent on completing documents and accounting tasks and too little on the actual implementation of projects;
10. create a system for co-financing innovative activities through e.g. small grants or vouchers for innovations;
11. introduce digital tools for professional capacity building such as webinars, distance trainings, other forms of e-learning, etc.;
12. include agricultural schools into the knowledge transfer system. Currently, there are no systemic links between agriculture advisory and agricultural schools;
13. raise soft competences of advisers and scientists. There is a shortage of communication skills in cooperating with farmers, facilitating contacts and maintaining them, facilitating knowledge transfer, etc.;
14. build knowledge transfer platforms with a search engine for sharing information among partners (advisers, scientists, farmers, teachers of agricultural schools and other interested bodies);
15. create an incentivizing system for implementing innovative solutions in agricultural practices by all partners.

SL: Slovenia

The structure of the institutions that form the AKIS in Slovenia are diverse, fragmented and vary from traditionally strong cooperation to more declarative cooperation. Although the AKIS structure is set up, it needs to be further improved and strengthened. Figure 10 represents the Slovenian AKIS and its actors.

Figure 10: AKIS structure in Slovenia



Within the AKIS 9 on-going Operational Groups (EIP) and 7 non-EIP related projects (M16) are related to CAP funding. Furthermore, the FAS is working closely with farmers by organizing various events (such as field trips, congresses, round tables and individual advising). The FAS is well recognized by the farmers (traditionally). It consists of 8 territorial institutes and 59 local units and employs over 300 advisors with different type of specialization. It is very accessible to all farmers, especially to small farmers. Advisors are also involved in the project activities in several national and international projects. Strengths of the system are that it has good regional coverage of the FAS and educational/research institutions and advise and public services are free of charge. The FAS provides specialized advice, education is free of charge and the FAS has a long history as a well-developed information system for data collection. Private, specialized advisory services are also available. Finally, there is active involvement of researchers in international cooperation and.

Weaknesses of the Slovenian AKIS are weak peer-to-peer exchanges of knowledge, a lack of mentorship, inefficient communication between institutions involved (e.g. research and the FAS), a lack of soft skills and a lack of coordinated actions among the Ministries. Furthermore, there is insufficient financing for research projects, weak transfer of knowledge and innovation into practice, weak identification of farmers' needs, weak development of scientific disciplines (e.g. digitization) and a lack of interest for agricultural and related studies. Finally, there is a lack of highly specialized public advice in specific areas (e.g. natural resource protection, climate change), obsolete infrastructures and equipment and a lack of interest among end-users for research results.

The main changes within the AKIS will be to strengthen the cooperation between the actors in the AKIS, to foster applied research in agriculture, forestry and food, to improve the infrastructure and equipment (e.g. specialized demonstration centers-farms), to strengthen the cooperation between ministries (Ministry of Agriculture, Forestry and Food, MAFF and Ministry of Education, Science and Sport, MESS) and to improve the mobility of farmers, advisors and researchers. These main changes are still under discussion in the preparation of the new CAP Strategic Plan. The reorganization of the MAFF is currently in place.

The main barriers and bottlenecks hindering knowledge flows in the AKIS are the fact that some actors are not well informed about the AKIS, a lack of communication / knowledge sharing between actors and research mainly being 'basic research'. There is a lack of applied research.

Furthermore, the FAS is over-occupied by administrative burdens and is not well equipped with the latest knowledge on specialized areas nor knowledge on soft skills. Agricultural holdings are not considered and advised in a holistic approach. There is a lack of appropriate financial instruments for the investments in research equipment and slow adaptation of the education system to live up to the needs of both the business sector and societal needs (at all education levels). These barriers could be overcome by fostering the improvement of communication and knowledge transfer between actors. Cooperation between ministries could be encouraged more. A memorandum of cooperation between the MAFF and MESS is in preparation. Finally, the Ministry Council for research development and knowledge transfer in agriculture, forestry and food will be established. It is planned to be officially established in May 2019. The process of discussion on the Slovenian AKIS has been on-going for a while (by public debates, presentations, etc.) and has recently been better recognized by the FAS. There is an internal working group on AKIS at the Ministry of Agriculture, Forestry and Food which has been set up at the end of 2018. The organizational set-up of the AKIS will provide advice, knowledge flows and innovation support services by stimulating active participation in operational groups (EIP projects) and other related projects. Furthermore, there will be attention for dissemination of knowledge through organizing practical workshops, field demonstrations (open farm days), interactive lectures and seminars using digital tools when appropriate. Better use of media (on international and national level) could be stimulated to achieve better informed end-users about the practical application of research results. Finally, there is ought to be more focus on efficient use of the National Rural Network (the future CAP Network) in relation to innovation and digitalization topics in agriculture, forestry and food.

Knowledge flows and the strengthening of links between research and practice will be enhanced by specific interventions in the future AKIS but this is still under the discussion. Regarding policy interventions, CAP measures M1, M2, M16 and M19 will be continued with perhaps some additional cross-cutting interventions in CAP 2020, taking into account the protection of IPRs. Regarding financial interventions, various financial instruments (the MAFF, the Slovenian Research Agency and others) could be implemented in order to strengthen agricultural, forest and food research.

The FAS system needs improving with regard to life-long learning of farmers' advisors, international exchanges, enhancing individual specialized approach, vouchers for specialized technological advisory services and specialized advisors for RDP measures. Better communication between researchers and end users should be encouraged to be able to answer the end users' needs more effectively and vice versa. This could be a key role for innovation brokers, which has not been implemented in Slovenia yet.

Interactive innovation could be strengthened by active involvement of all actors all along the innovation and research process and implementing the multi-actor approach. Particular financial incentives could be stimulated for research and innovation developments in SMEs and start-ups (through Regional Development Agencies and Technology parks). To foster the digital transition in agriculture, the plan is to further develop the Rural Innovation Networks (regional [FabLab Networks](#)) and the Digital Innovation Hub (DIH AGRI FOOD by the Innovation Technology Cluster) in strong cooperation with the University of Ljubljana and other actors. The MAFF is supporting digital transition in agriculture (through the declaration of 'A smart and sustainable digital future for European agriculture and rural areas', which has been signed in Brussels on April 9th 2019 at the [Digital Day 2019](#)). The MAFF is planning to prepare 'A digital strategy' and an action plan in order to support the digital transition in agriculture at strategic level. All these documents need to be harmonized with already existing European and national documents on digitalization in urban and rural areas. Furthermore, the MAFF is planning to co-finance the OECD study on 'Enhancing rural innovation in rural areas' (with financial contribution by the MAFF, the Ministry of Economic Development and Technology and the Government Office for Development and European Cohesion Policy). Finally, the plan is to introduce digital vouchers for SMEs and other (innovative) business, which will be launched in April 2019, by the [Slovene Enterprise Fund](#). These

[vouchers would concern 1\) digital marketing](#), 2) [the preparation of digital strategy](#) and 3) [increasing digital competences](#).

SE: Sweden

The Swedish AKIS is characterized by farmers who are comparatively well educated with a high level of digital skills. Most full-time farmers have an advisory contact on the private market, which is dominated by three companies. Environmental advice is financed through the CAP, which is mainly run by the successful advisory project 'Focus on nutrients' (through both a top-down and a bottom up approach). Networking between advisors mostly takes place on an individual basis. Support for advisors is given by the authorities in certain fields of public interest such as plant protection. The agricultural sector takes in a weak position in the otherwise rather strongly and publicly financed R&I landscape in the country. There is insufficient applied research and a weak bridge between academics and agricultural practice. Of the EAFRD, 6% is allocated for the AKIS 2014-2020, for EIP-AGRI and advisory services and educational activities are financed through (LEADER-)CLLD. The Swedish rural network consists of approximately 100 actors and is run by the Board of Agriculture.

The recent food strategy of the nation has pinpointed the strategic importance for knowledge and innovation in the future. The following needs were identified. First, there is a need for greater cooperation in the food sector to canalize the demand for knowledge and innovation and the enhancement of resources (established in the Sweden Food Arena). Second, there is the need for increased applied research to strengthen the bridge between research and practice. So far the National Committee for Food Science has been established and there are increased finances for research. However, Sweden is still looking for further solutions and finances for the future. Third, food production should be better integrated in the rest of the national innovation system. The food sector is a new priority for the Swedish Innovation Agency. Finally, the state does not want to intervene in the market of advisory service but networking, some other support functions and specific areas for advisory services could be strengthened, also with regard to CAP article 13.

Regarding planned interventions for the future of the AKIS, Sweden is likely to continue the EIP and advisory service. The challenges in organizing finances and administration need to be solved, as well as the challenge to increase the interest for knowledge in a sector with financial difficulties. Knowledge flows and strengthening links between research and practice could be enhanced by financing (more) field trials and demonstration farms. Regarding farm advisory services, some areas will need to be strengthened considering the public interest and more budget is ought to support better cooperation and exchanges of knowledge between actors. To enhance interactive innovation, simplification of EIP is needed, as well as increased awareness of the importance of the food sector. With regard to supporting the digital transition in agriculture, the Swedish public authorities do not want to intervene in the private market for digital solutions, but sufficient resources for good broadband connections will be a requirement.

II. Interactions among the AKIS actors

The study has also been concerned about how are the interactions that occur among the different relevant AKIS actors, as it is considered of relevance to think about future interventions and actors to be targeted.

In the study we have considered the following 16 AKIS actors categories:

1. Universities
2. Research institutes
3. Applied research institutes/Technology centers
4. Agricultural education (schools, higher institutes, universities,...)
5. Entities that provide lifelong training
6. Impartial Agricultural Advisory Services

- Public
- Private
- 7. Farmers' organizations
- 8. Cooperatives and Federations of Cooperatives
- 9. Public administrations involved in knowledge and innovation. Indicate also funding bodies
- 10. Companies for the provision of agricultural inputs including knowledge services
- 11. Financial entities with specific orientation to the agri-food sector/banks
- 12. Other organizations (Foundations, NGOs, ...)
- 13. Demonstration farms
- 14. Agrifood Industry (processors etc.)
- 15. Distribution/retailers
- 16. Others (Producers' Organizations, Regulatory Councils, Livestock Integrators, Tech suppliers (ICT services, DST suppliers)).

As mentioned in the Methodology section in order to assess the degree of the interactions, different grades from 0 to 5 were identified depending upon the following aspects:

- 4-5 grades were foreseen for those cases where there was a lot of interaction: MOU's, joint programs and activities, service contracts, formal collaborations (EIP-Agri OG's), and evidence of data and information sharing on a routine basis;
- 3 in between both scenarios. Were there was an incipient relation with increasing collaborations without any formal engagement
- 1-2 grades were foreseen where there was no history of regular formal engagement, only ad-hoc and infrequent collaboration or engagement. They generally relied on third party access to information e.g. print media or social media.
- 0 were no interaction occurred

This has been applied with a consideration of the different existing realities, for instance in The Netherlands, the interactions between impartial private Advisory services and the universities and research institutes through the alumni network with a grade 2. While in Slovak Rep. for the interactions occurring among the same actors through events and training it has been graded as medium average (3). This criterion for the assessment of the interactions has allowed us to get a common a comparable vision on how to better assess knowledge flows and interactions among AKIS actors.

Interactions between Research institutes and other relevant AKIS actors

The pluralistic number of actors in the AKIS at country and regional level allow actors to have different relevance in their AKIS depending on the country/region situation and background. Although it can be identify those countries with an AKIS more structured by the shape of the different interactions that the Research institutes have with the other relevant actors (see figures 11-24)

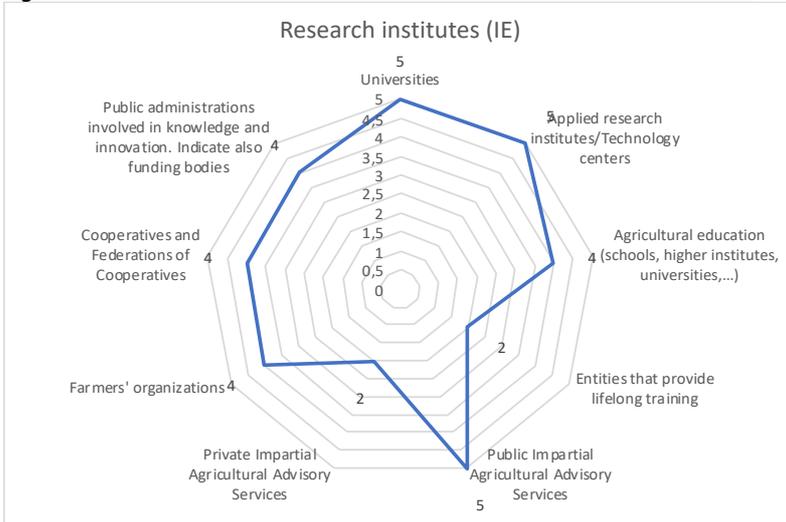
At this regard we can see how in Finland the degree of interactions between the research institutes (namely LUKE) is very high and homogenous, as in Ireland the research institutes (namely TEAGASC) have strong interactions with the rest of the actors except with private advisory services and entities providing lifelong training.

It can be as well highlighted the interactions between research institutes and farmers organization and cooperatives federations in a significant number of countries. It seems that the incentives set up for their engagement and the development of the interactive innovation model through the EIP-AGRI has allowed strengthening their collaborations.

In contrast to this there are as well a number of countries where there are different level of engagement between research institutes and the other relevant AKIS actors, due to a less

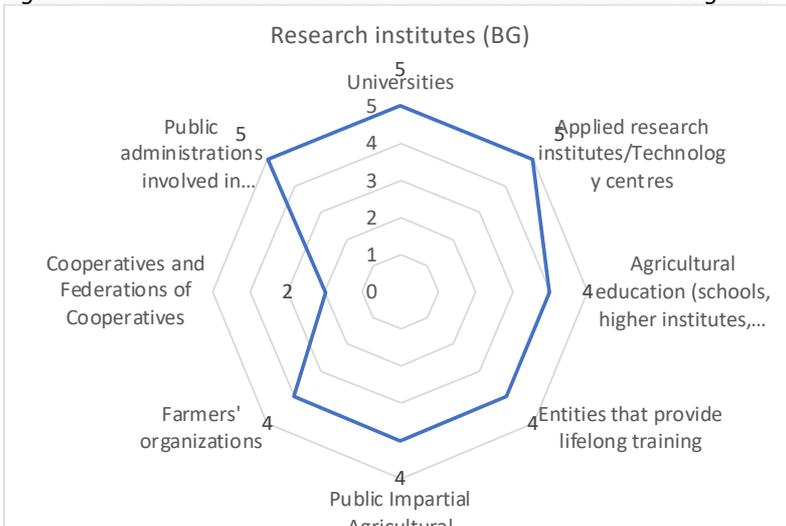
structured AKIs as reflected in the different reports (Pro-AKIS and SCAR- SWG AKIS) and also because the weight of other actors differs from one to another. At this regard it can be noticed how strong interactions occur between research institutes and farmers organizations and impartial advisory services (public or private or both depending on the country) like in Hungary (Chambers of Agriculture), Romania and Poland, while the interactions with cooperatives is less relevant.

Figure 11: Interactions between R+D and other AKIS actors in Ireland.



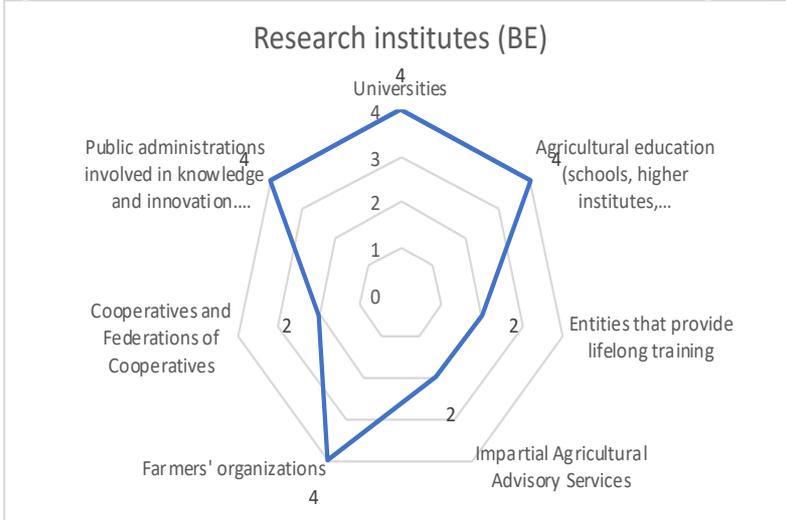
Source: Author's elaboration based on questionnaire results

Figure 12: Interactions between R+D and other AKIS actors in Bulgaria.



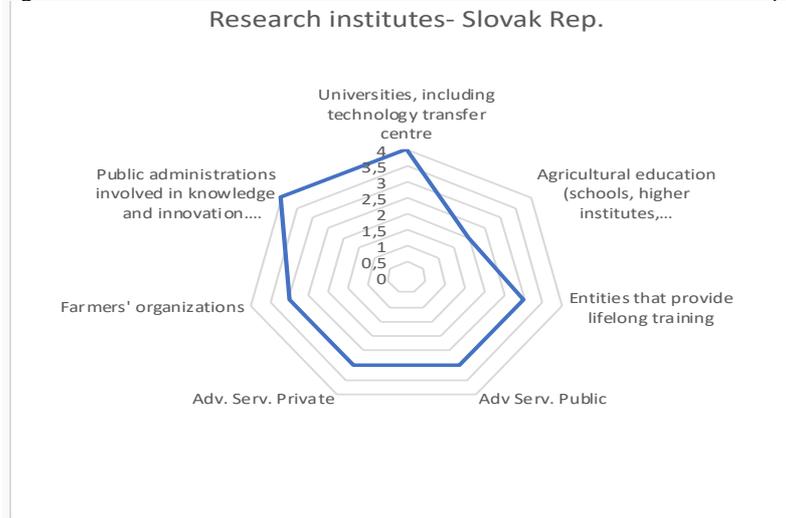
Source: Author's elaboration based on questionnaire results

Figure 13: Interactions between R+D and other AKIS actors in Belgium.



Source: Author's elaboration based on questionnaire results

Figure 14: Interactions between R+D and other AKIS actors in Slovak Rep.



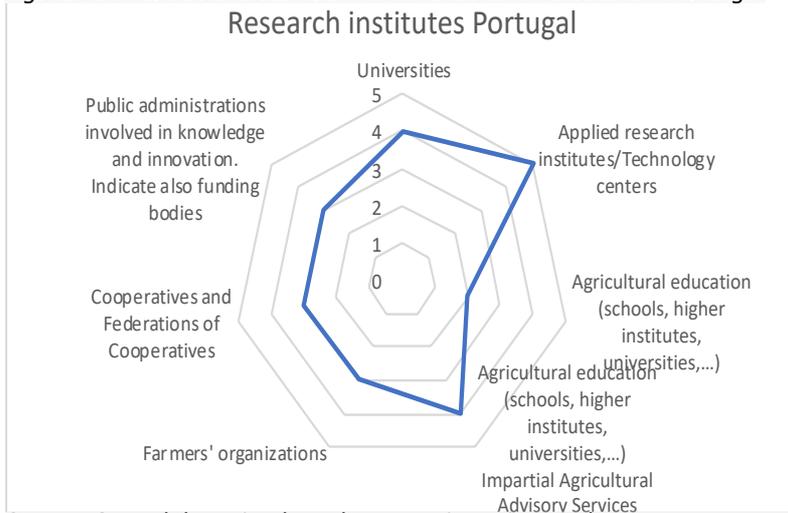
Source: Author's elaboration based on questionnaire results

Figure 15: Interactions between R+D and other AKIS actors in Finland.



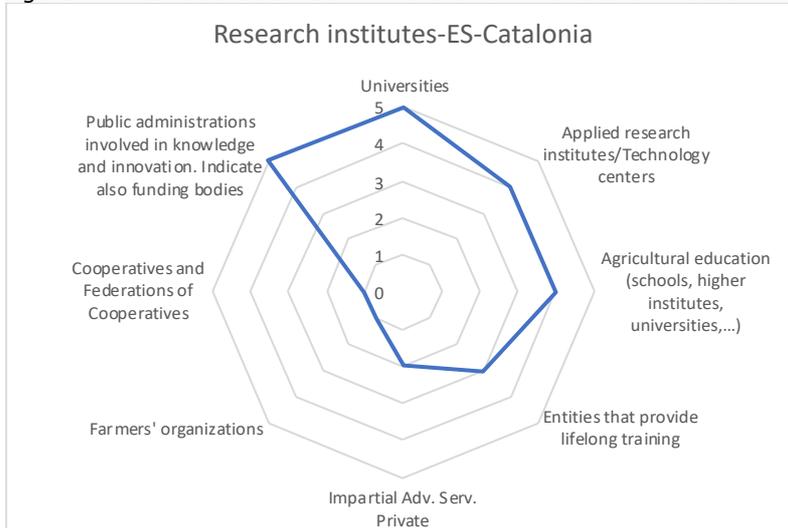
Source: Author's elaboration based on questionnaire results

Figure 16: Interactions between R+D and other AKIS actors in Portugal



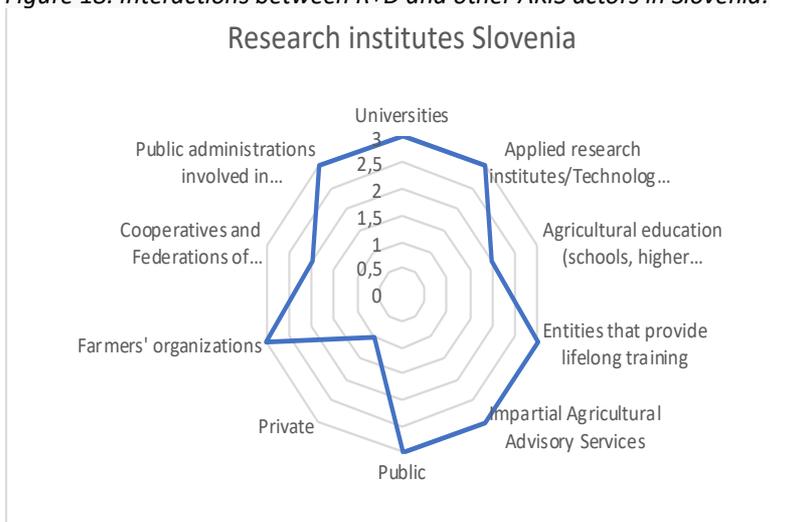
Source: Own elaboration based on questionnaire results

Figure 17: Interactions between R+D and other AKIS actors in Catalonia region-Spain.



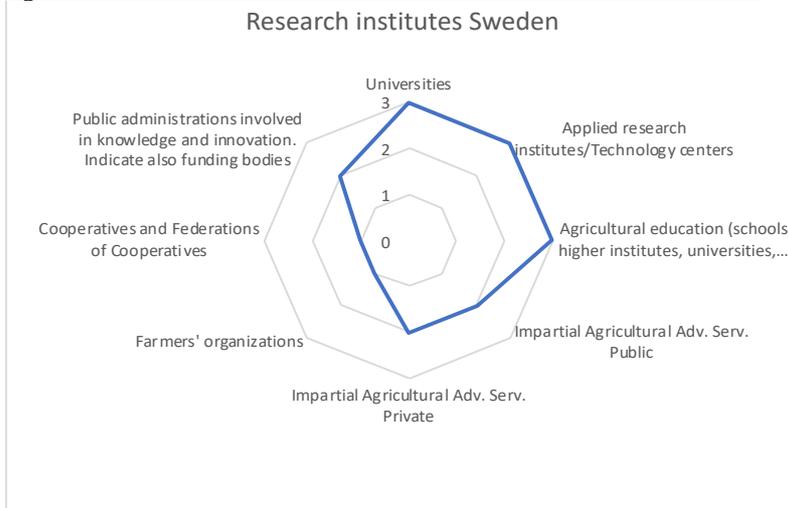
Source: Author's elaboration based on questionnaire results

Figure 18: Interactions between R+D and other AKIS actors in Slovenia.



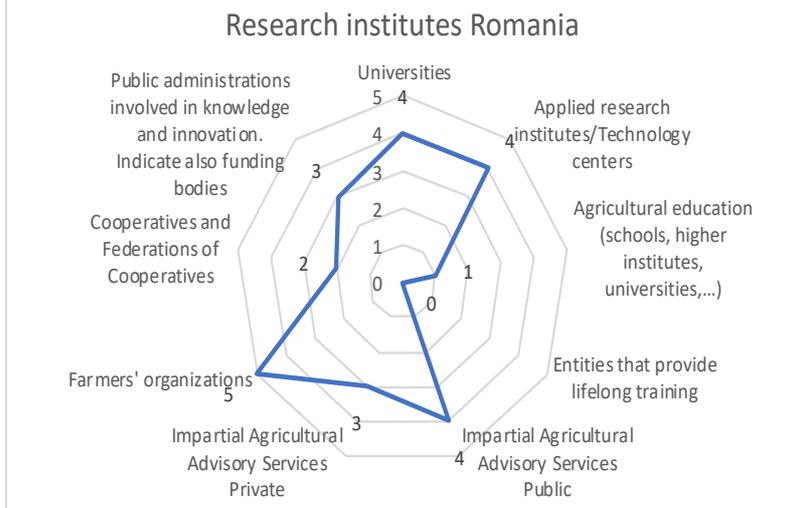
Source: Author's elaboration based on questionnaire results

Figure 19: Interactions between R+D and other AKIS actors in Sweden.



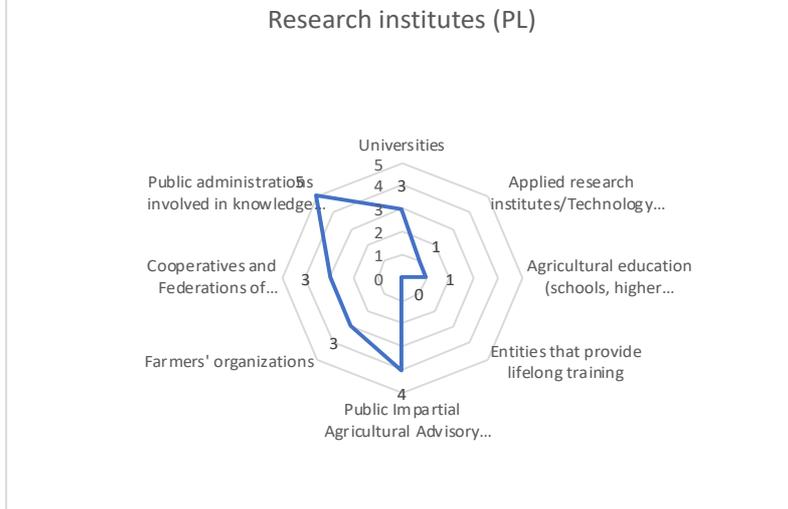
Source: Author's elaboration based on questionnaire results

Figure 20: Interactions between R+D and other AKIS actors in Romania.



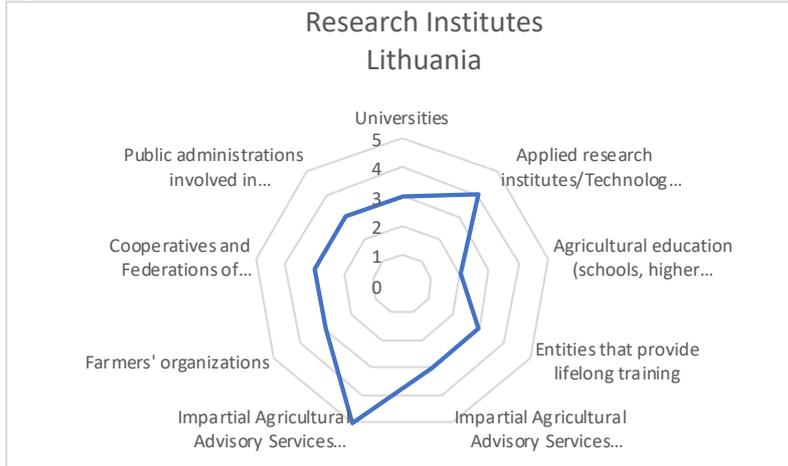
Source: Author's elaboration based on questionnaire results

Figure 21: Interactions between R+D and other AKIS actors in Poland.



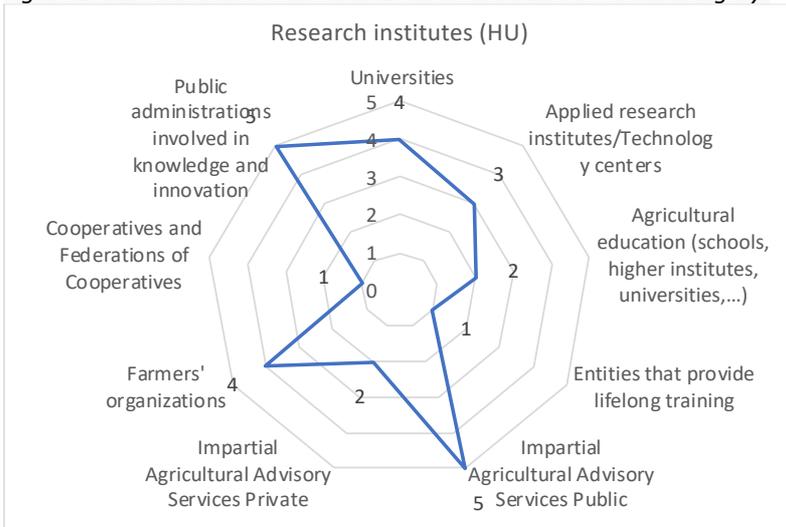
Source: Author's elaboration based on questionnaire results

Figure 22: Interactions between R+D and other AKIS actors in Lithuania.



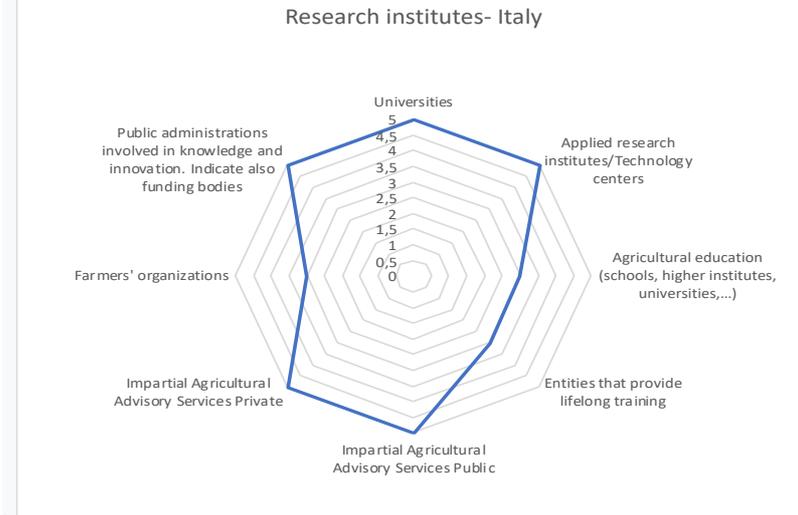
Source: Author's elaboration based on questionnaire results

Figure 23: Interactions between R+D and other AKIS actors in Hungary.



Source: Author's elaboration based on questionnaire results

Figure 24: Interactions between R+D and other AKIS actors in Italy



Source: Author's elaboration based on questionnaire results

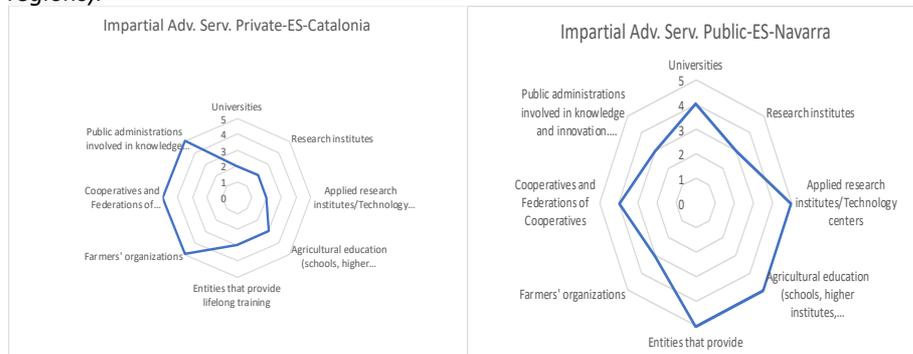
Interactions between impartial advisory services and other AKIS actors

The main characteristic of the interactions between impartial agricultural advisory services is referred to those cases where there are mixed systems of public and private advisory services, the interactions among them (public-private) are very weak with the exception of Belgium, Finland and Sweden. For the future development of impartial advisory services as proposed in the EU regulation for the period 2021-2027 it is foreseen a need to enhance these interactions and promote better coordination activities among both type of advisors working with the farmers. It is as well noticed that in those countries/regions where both types of advisory services co-exist, the publics have more enhanced interactions with other relevant actors than those from private except in Belgium, Slovak Rep. and Sweden.

In a number of countries and regions, there exist little connections between impartial advisory services and research institutes with the exception of those countries with Research institutes providing these services for farmers (e.g.: Ireland and Navarra region in Spain).

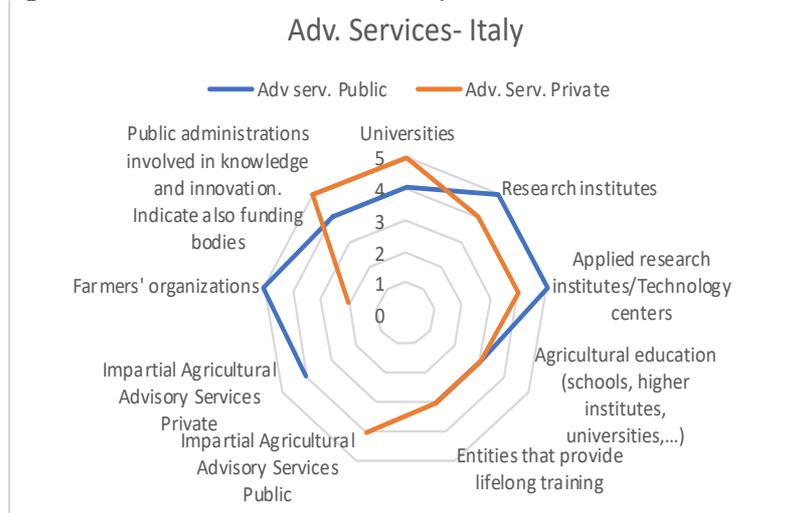
It is as well noticed that in general impartial advisory services are well connected to public administrations, which allow thinking that future interventions from public administrations targeted to this group of actors would allow to have an impact in the sector.

Figure 25: Interactions between Advisory Services and other AKIS actors in Spain (Catalonia and Navarra regions).



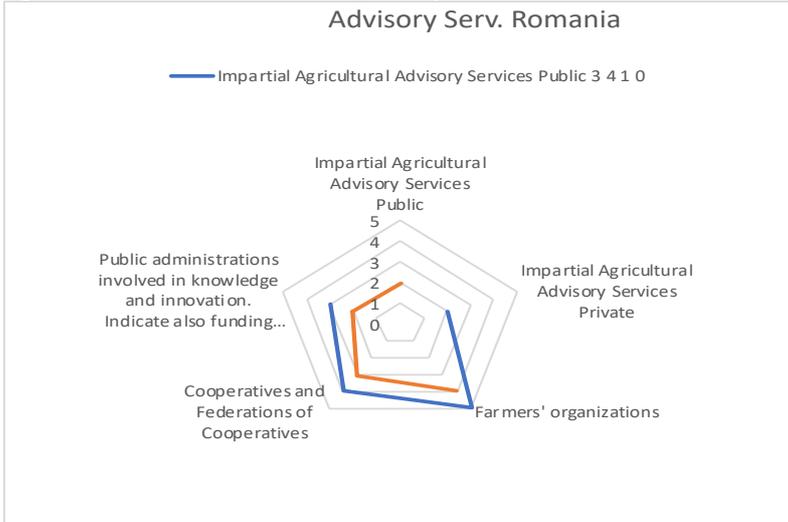
Source: Author's elaboration based on questionnaire results

Figure 26: Interactions between Advisory Services and other AKIS actors in Italy.



Source: Author's elaboration based on questionnaire results

Figure 27: Interactions between Advisory Services and other AKIS actors in Romania.



Source: Author's elaboration based on questionnaire results

Figure 28: Interactions between Advisory Services and other AKIS actors in Sweden.



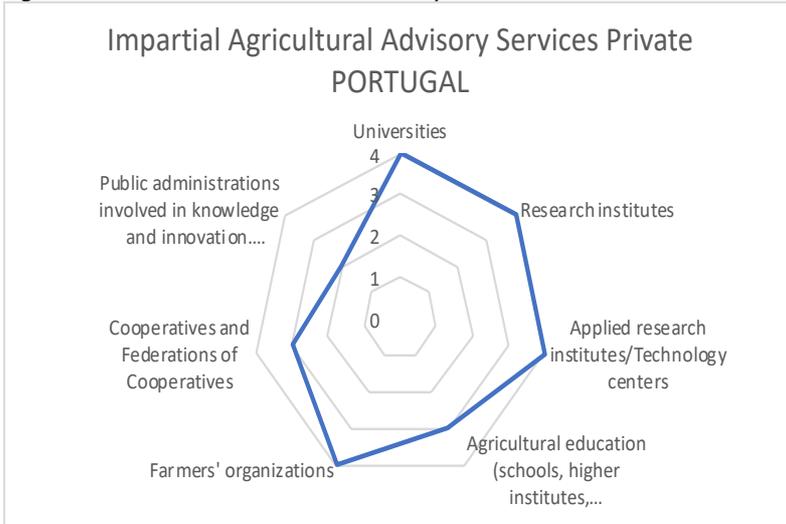
Source: Author's elaboration based on questionnaire results

Figure 29: Interactions between Advisory Services and other AKIS actors in Slovenia.



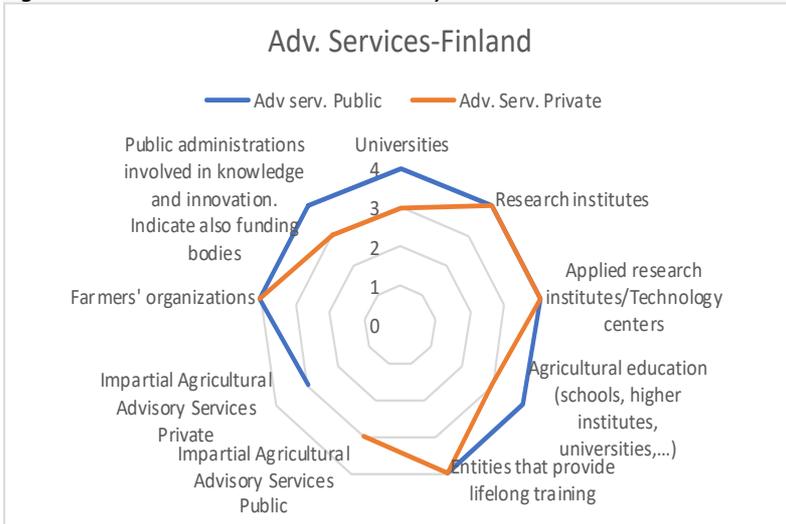
Source: Author's elaboration based on questionnaire results

Figure 30: Interactions between Advisory Services and other AKIS actors in Portugal.



Source: Author's elaboration based on questionnaire results

Figure 31: Interactions between Advisory Services and other AKIS actors in Finland.



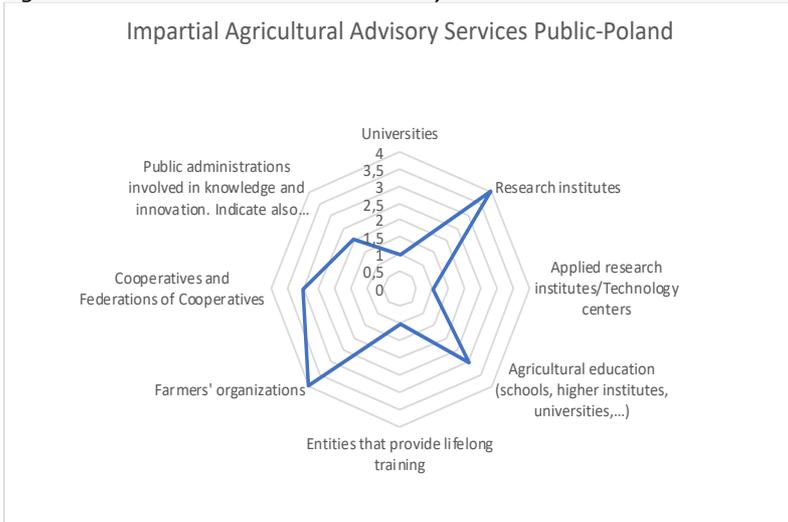
Source: Author's elaboration based on questionnaire results

Figure 32: Interactions between Advisory Services and other AKIS actors in Slovak Republic.



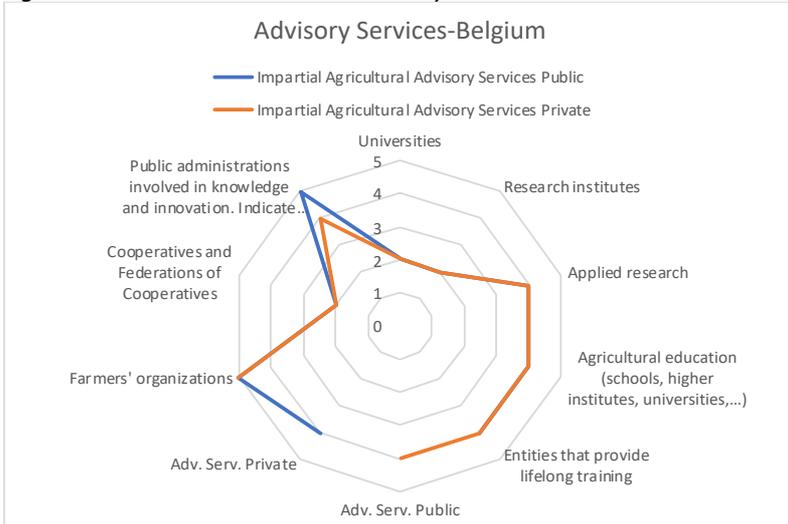
Source: Author's elaboration based on questionnaire results

Figure 33: Interactions between Advisory Services and other AKIS actors in Poland.



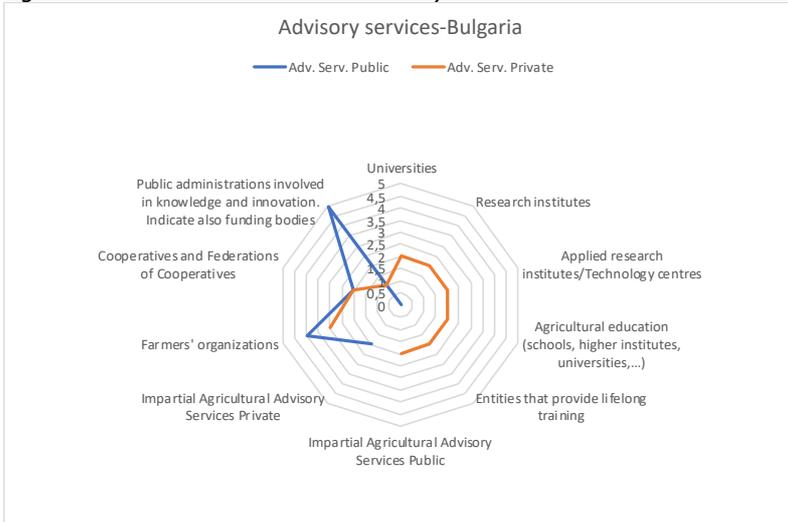
Source: Author's elaboration based on questionnaire results

Figure 34: Interactions between Advisory Services and other AKIS actors in Slovak Belgium.



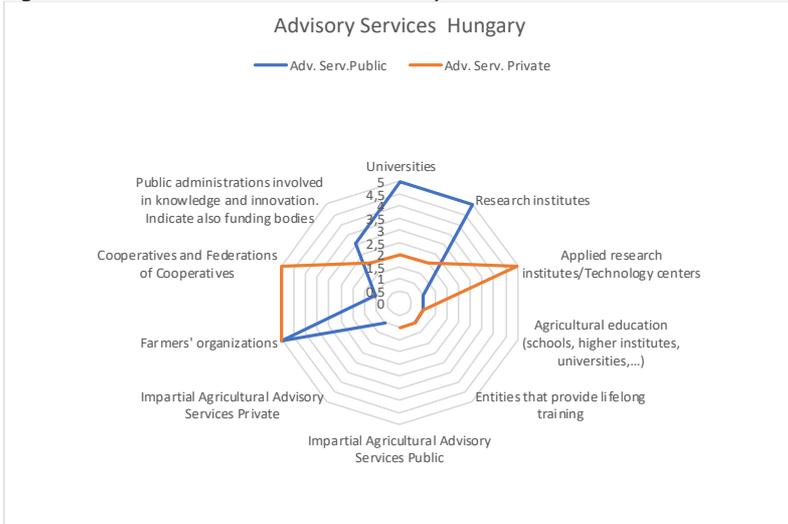
Source: Author's elaboration based on questionnaire results

Figure 35: Interactions between Advisory Services and other AKIS actors in Bulgaria.



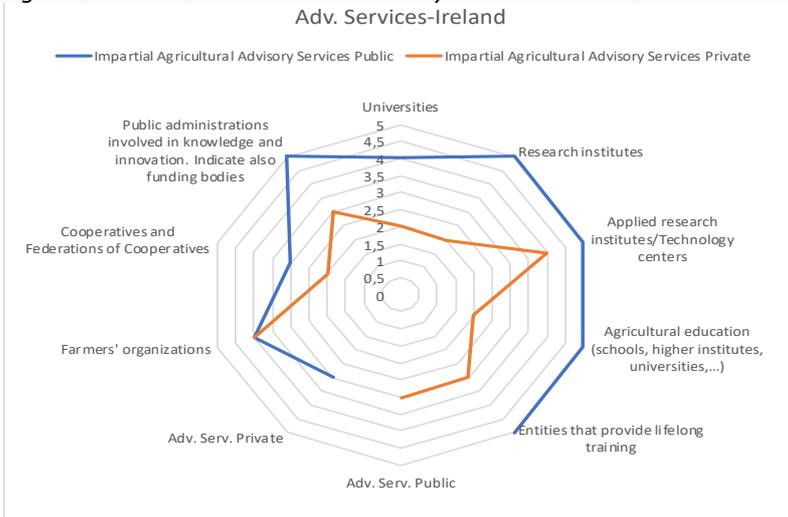
Source: Author's elaboration based on questionnaire results

Figure 36: Interactions between Advisory Services and other AKIS actors in Hungary.



Source: Author's elaboration based on questionnaire results

Figure 37: Interactions between Advisory Services and other AKIS actors in Ireland.



Source: Author's elaboration based on questionnaire results

Agricultural Advisory Services providing Innovation Support Services (ISS)

Another aspect of interest regarding the new roles for Advisory services within the development of the interactive innovation model is the provision of innovation support services. Recent publications showed that there are examples showing advisors active as innovation brokers and facilitators in “interactive innovation projects” (e.g. Moschitz et al, 20151; ‘Wielinga et al, 2017), but these good examples were still limited in number, this was also noticed within Agrispin H2020 project. In this study we have noticed that there is an increasing participation of these actors providing innovation support services in a number of countries: Poland, Bulgaria, The Netherlands, Greece, Lithuania, Hungary, Sweden, Belgium, Slovenia, Portugal, Finland, Ireland, Estonia and Spain. It is considered a progress respecting the recent evidences due to the effect of the rolling out of Rural Development programs 2014-2020 that have allocated funding in European countries and regions for EIP-AGRI Operational Groups aimed at stimulating such interactive processes for bridging the gap between practice and research. This is consistent with the active participation of advisory services in a number of OG’s as shown by the recent report of the EC on OG’s assessment 2018 (Knotter et al 2019), where it is noticed that Advisory lead 12% of the total OG’s assessed for the study and the number of this actors where of 99, the fourth among the different types of actors participating in the OG’s.

During the development of this study, some experts noticed the capacity of retired advisors for running the role of innovation support service.

In The Netherlands, Innovation brokers (private advisors and 1 or a few from ZLTO) are deployed by the topsectors (Agri-Food: circa 10 and Horticulture & Starting Materials: 5). They are primarily aimed at supporting SMEs, answering questions, initiating new activities and organizing network activities. The innovation brokers have an independent role and they are not connected to a knowledge institution. The broker is 50% privately co-financed. Specific for SMEs is the SME Innovation Stimulation Top sectors (MIT) scheme. The MIT scheme is carried out by RVO (the paying agency) together with the regions (Provinces). There are two types of calls: one for small instruments (knowledge vouchers, innovation advice and feasibility studies) and one for the larger R&D collaboration projects.

Besides the increasing role of Advisory Services as ISS, there are different organizations mainly from the Research and technology side, delivering these services. There are examples in all the member States and regions:

In Spain, a number of regional research and technology centers have performed this role since the beginning of this programming period, based on the experience and knowledge of the process, administrative capacity and relations with sector.

In Flanders- Belgium, there are different actors performing ISS activities: Private companies e.g. LUBA advice/innovation support for dairy farmers; ILVO, the public Research Institute for Agriculture, Fisheries, and Food as a service provider; Innovatiesteunpunt that provides innovation support on different aspects e.g. energy, water, new crops, multifunctional farming, agro-ecology (biofarming) etc. This organization is also part of the: Boerenbond (Farmers' Union) that gives advice/innovation support on different aspects e.g. innovation support on emissions, re-orientation of the farm etc.

In Bulgaria, there are different organizations besides Adv. Services providing ISS, to refer the experience of Foundation for Organic Agriculture BIOSELENA. The Foundation was established in 1997. The main task of BIOSELENA is developing and supporting the sustainable and organic agriculture, biodiversity preservation and environment protection.

In Lithuania, the Agriculture Advisory Service in collaboration with the researchers from Agriculture Academy of Vytautas Magnus University are creating the new and first in the country innovation support services.

In Hungary, in the frame of EIP-AGRI: those who saw the opportunity in setting up OG's (LAGs, NGOs etc.) took the role of an innovation broker, but with the scope on some projects, not to function as an innovation support service in a broader sense.

Out of the frame of EIP-AGRI: Discovery R&D Center is providing actively these services. In addition, there are a lot of innovation service exist (based on the American model), but not specifically focusing on agriculture.

In Finland, the NRN unit is working also as ISS (so as for Estonia), with small resources but using networks and information channels. It is considered that according the new RDP assessment the most active lead partner in all the co-operation actions are the regional / local development companies which are owned by the municipalities. (113 projects). The second ones are the Universities of Applied Sciences. (23 in the Mainland Finland), especially those which are giving education in natural resources (92 projects). In addition, all kind of NGO's are active, including farmers union

In Slovak Republic, the Slovak University of Agriculture has established Technology Transfer Centre which serves as an Innovation support service. In addition, it is a member of Danube Technology Transfer Centres Network within Danube region so it has macroregional character.

Other actors' interactions.

As stated in the SCAR SWG AKIS policy brief on “New approaches on Agricultural Education Systems, agricultural actors have different degrees of engagement in education. It can be as well noticed from the results of the survey, where the interaction between education and other relevant actors is weaker with respect to the existing interactions occurring within AKIS. A special remark needs to be done for the interactions with lifelong learning entities that seem to be disconnected in the major number of countries of the other relevant actors. The only exceptions are reported for those countries and regions where public administration have stronger role in providing these training.

This happens in a context where lifelong learning forms the frontline for innovation as stated in the already mentioned policy brief.

Within the framework of future development of AKIS and the relevance of new funding mechanisms out of those traditional linked to EAFRD and Horizon 2020, at policy level there is a raising awareness on financial instruments. In fact for the next period, the EC regulation proposal presented in June 2018, considers financial instruments through Art. 74 on the rules applicable to financial instruments within section 2 on elements applicable to various types of interventions. It is relevant to notice that the interactions between financial entities and the main relevant actors within AKIs are mostly weak.

Chapter 2. Future strategic development of the AKIS

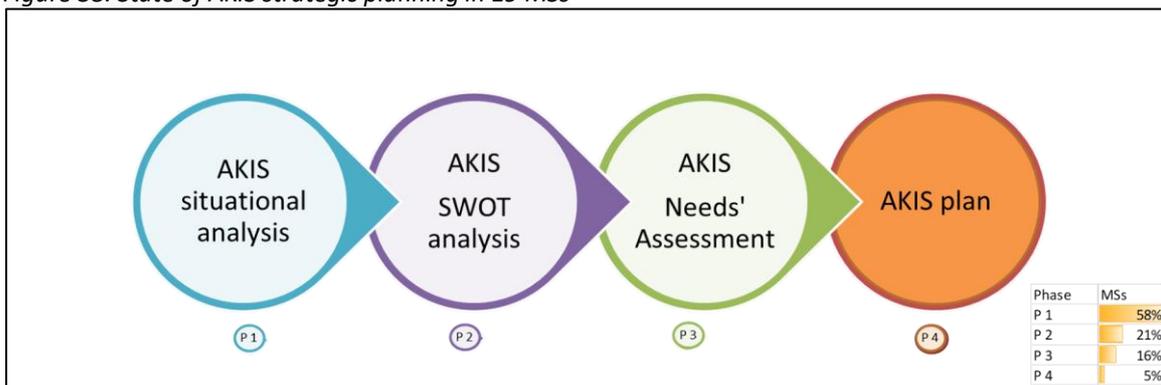
I. In relation to the future strategic development of AKIS

Pre-Assessments on structures, needs and knowledge flows

According to the art. 102 of the proposal of regulation COM(2018)392 the roadmap to the AKIS strategic plan needs to be developed across the 4 phases identified in figure 38:

On this regard, most of the MSs are still at a very early stage of the preparation of the AKIS plan, since 58% of the MSs is going through the initial phase of conducting the situational analysis of the actual AKIS.

Figure 38: State of AKIS strategic planning in 19 MSs



Source: Own elaboration based on questionnaire results

According to the answers from the MSs, in general, the situational analyses are based on external studies which are specifically aimed at identifying the actual actors of the AKIS, the roles and the functions they play and the state of the knowledge flows among them.

To this end, the national case studies conducted for the [PROAKIS](#) project are widely recognized as fundamental to conduct the situational and SWOT analyses and the needs' assessments of the AKISs. In fact, in many MSs these are the most recent source of information on the actors and the assessment of the AKIS.

Furthermore, with the aim to update the above-mentioned assessments of the national AKIS and identify the multitude of relevant actors, who promote the knowledge flows in the agricultural systems, the MSs refer to the beneficiaries of the most significant agricultural funding schemes implemented since the CAP programming period 2007-2013. On this regard, the most mentioned AKIS actors which, according to the MSs, need to be mapped are: (1) partners of the operational groups which are co-financed under measure 16 of the RDPs 2014-2020; (2) partners of the H2020 projects; (3) partners of the cooperation projects co-financed under the measure 124 of the RDPs 2007-2013; (4) advisory services; (5) demonstration farms; (6) beneficiaries of vocational training projects.

As well, to assess the actual state of art of the AKIS, MSs rely on the RDPs' evaluations, of both the 2007-2013 and 2014-2020, with specific reference to the assessments on the interventions supporting to the vocational training, the advisory service setting up and its use and the cooperation for innovation.

Few of MSs mentions the most recent reviews (2015-2019) of the OECD on the Innovation, Agricultural Productivity and Sustainability in the respective countries (Latvia, Estonia, Sweden) as reference to conduct the situational and SWOT analysis.

In general, for the conduction of the pre-assessments on structures, needs and knowledge flows, the Managing Authorities rely on external experts, such as the evaluators, the National Rural Networks, the Research institutes, Universities and the RDP's technical assistance services (e.g. SI, IT, IE, EL,HU).

In a relevant number of MSs set up specific working groups on the AKIS with the duty to steer the whole process towards the AKIS strategic plan, to coordinate and follow-up the studies carried out by the external experts.

The composition of these specific working groups is varying according to the different approaches in use and the sensitiveness of the managing authorities to involved actively the stakeholders in co-processes towards the AKIS strategic plans. Mostly, the core of the specific working groups is composed by the managing authorities, the NRN, the research institutes and the universities. While, other key AKIS stakeholders, such as, among the others, the farmers' organizations, farmers' unions, advisory services, trainers and educational institutes, are involved systematically in focus groups, workshops and other participatory sessions aimed at discussing, validating and integrating the situational and SWOT analyses.

The national rural development networks are mostly committed to facilitate and organize the participatory events aimed at promoting reflection and sharing the assessments and the identification of relevant interventions by the stakeholders across the different stages of the AKIS strategic planning. In few cases (e.g. IT) the NRN are also committed to methodological support for the CAP strategic planning and the conduction of specific studies, of the situational and of the SWOT analyses.

Box 1: The AKIS strategic planning in Finland

At the end of 2018 MAF launched an open, public call for ALL interested persons/parties to participate in the planning process by participating in workshops (about 30 all together) during the 1st half of 2019. There has been 20 – 60 participants in each of the workshops according their interest. They got information about the future CAP –plan / regulations and gave their opinions and ideas for the plan.

In many cases there was also an open skype webinar afterwards for those who could not participate in the live workshop. Three of the workshops concerned training, advisory, cooperation and one (last week) about EIP.

The participants have represented farmers, advisors, research, training, NGO's, NRN, Leader and regional administration and other regional and national actors.

Regional administration was asked to gather and give their opinion and ideas about the draft of Needs Assessment. The results and responses are currently analyzed.

The draft of Intervention Strategy was open for public debate in "[Otakantaa.fi](#)" The results and responses are currently analyzed.

"Otakantaa.fi" (youropinion) is an official network service to enhance dialogue and participation between citizens, organizations and public authorities. The service facilitates civic participation and access to information and enhances the transparency and quality of decision-making and decisions.

Specially for farmers there has been a series of regional events organized by the MAF with farmers organizations to explain the CAP –reform and planning. All the feedback has been recorded.

Box 2 - The case of the AKIS strategic planning in Italy (multi-level AKIS planning and governance)

The AKIS strategic planning in Italy is challenging due to the vary of regional AKISs and the different levels (Regional and National) of certain competencies (research, education, extension) on the knowledge flows. The new CAP model requires a multilevel governance which has to recognize and valorize the specificities of the regional AKISs through a better coordination of all the different types of actors who have the potential to contribute to knowledge flows towards a better functionality of the respective AKISs.

All over, in conducting the structural and functional analyses of the AKIS need to recognize that, since the CAP programming period 2007-2013 in Italy, with the implementation of cooperation for innovation interventions and the support to other collective interventions focused more on environmental issues and organic farming, the regional AKISs have changed and still are gaining a momentum. The current AKIS are populated by new actors that were set up due to the policies (e.g. innovation brokers, clusters, networks, organic districts), new entrants, that before had no interconnections with the agricultural sector (e.g. pharmaceutical industry), old regional extension agencies, that had lost their functionality due to the budget cuts, and the others already operative that in some cases reconsidered their own roles and functions within the AKISs (e.g. research institutes playing extension services to farmers).

In this context, it has been decided that the roadmap to the CAP strategic plan, including the AKIS strategic plan, will be common and it is coordinated under the responsibility of the Ministry of Agriculture, Forestry and tourism with the support of the National Network for Rural Development (NRN) which has delineated the overall approach and the methods for a co-development, national and regional administrations and other stakeholders, of the entire CAP strategic plan.

Multilevel thematic joint groups (3 for each of general objective of the CAP plus the one for the AKIS) will meet regularly since July to November 2019 to co-assess the current situation (context analysis), to conduct the SWOT analysis and the needs' assessment towards the CAP plan.

Each region is organizing own consultative processes with the stakeholders. These processes have different degrees of effective participation and they will bring to the definition of the current situation of the AKIS, of the SWOT and of the needs' assessment at regional level. All these

analyses will be systematized within multilevel thematic joint group during the participatory meetings.

The NRN will support the regional administrations in conducting their own situational and functional analyses of the current AKIS, in terms of provision of data and qualitative/descriptive knowledge on the regional AKIS, of methodologies for the conduction of the stakeholders' meetings and of the assessments.

At the moment, the regional administrations are working with the thematic AKIS group of the NRN to map the current AKIS actors at regional level and to analyze their functionality within the AKISs.

Box 3 - The case of the AKIS strategic planning in Spain (the process, the AKIS assessments at multi-level planning and governance)

The Ministry will organize a working group with the regional governments to develop a common vision on the AKIS 2021-2027.

The Ministry of Agriculture, Fisheries and Food, organized in Feb. 2019 a workshop on AKIS situation in Spain. The knowledge flows were assessed through a questionnaire and by providing the degree of the interactions among the different actors. Five regions among 17 answered to the questionnaire. There is also the possibility to assess the knowledge flow through a desk research on existing literature and projects related to these issues.

The knowledge has no borders (let alone administrative borders). Therefore, AKIS cannot be rightly separated in administrative pieces. Instead, AKIS functions more like an ecosystem, in a mosaic structure that builds up at different scales. But since we work with administrative borders and limitations, to develop common visions it is important that all the regional AKIS know about each other so that the National AKIS makes sense. The first step to achieve this is for every region to carry out a detailed diagnosis of their AKIS (identification all the actors involved on AKIS, AKIS mapping), and then to define their needs and priorities to support and improve them. It becomes then clear that more tools are needed to facilitate interconnection between AKIS actors and Regional AKIS, but also more and new tools are needed to achieve knowledge capitalization and visualization and innovation take-up.

In Catalonia, are at this stage, building the National Pact for the knowledge-based society, which will help improving innovation globally. In addition, the drafting process of the first PRITAC, all AKIS components were involved. It is aimed to reach optimal agreement amongst AKIS actors in the actions to be undertaken in order to correctly respond to end-users and society demands.

Within this context , other existing initiatives like the Micro AKIS sectoral analysis could provide added value to contribute to the development of the common vision.

Approaches, methods and tools to strategic Planning

Member States are widely implementing approaches and methods aimed at achieving common visions and sharing perspectives among the AKIS actors towards the AKIS strategic plans 2021-2027. Unless, the degree of their effective participation in co-assessment and co-development processes is vary across Europe.

Largely, the situational and SWOT analysis are carried out by external experts (i.e. research institutes, universities), under the responsibility of the actual RDP' managing authority and with the support, in some cases, of a specific working group (phases 1 and 2 in figure 1). In these cases, very often the organization of participatory workshops is due to involve, afterwards, the relevant AKIS actors in consultative exercises mainly aimed at validating and reviewing the external studies.

More often, the effective involvement of the relevant AKIS' actors in co-processes comes only at a later stage, to assess the needs and to identify the different types of interventions for the AKIS strategic plan (phases 3 and 4 in figure 1).

MSs are widely applying a systemic approach tall along the development of the AKIS plan and this is based on the involvement of the different types of AKIS actors in joint participatory sessions. This will very realistically bring to the development of common visions on the AKIS strategies and their implementation. Instead, very few MSs are conducting participatory sessions with separate groups of AKIS actors.

In fact, in most of the MSs, specific stakeholders' working groups (e.g. BG) have been set by the managing authorities to ensure the wider involvement of the multitude of actors into the AKIS planning process.

The methods and tools in use to address the active involvement of the AKIS' actors into the strategic planning are vary (table 3).

Table 3: Methods and tools to involve the actors in AKIS strategic planning

Methods and tools	Situational analysis	SWOT analysis	Needs' assessment	AKIS planning
Face-to-face	Workshops	Workshops	Workshops	Workshops
	Focus groups	Focus groups	Focus groups Local Events	Focus groups
Digital infrastructures	Skype webinars	Skype webinars	Skype webinars	Skype webinars
	Public consultative process	Public consultative process	Digital platforms Public consultative process	Digital platforms Public consultative process
Desk analysis	Specific studies (various sources)	Specific studies (various sources)	Specific studies (various sources)	
	RDP's evaluations	RDP's evaluations	RDP's evaluations	
	Surveys	Surveys	Surveys	

Source: Own elaboration based on questionnaire results

Box 4 - The use of the Platform for Agricultural research for the AKIS strategic planning in Belgium Flanders

The Platform for Agricultural Research ([Platform voor Landbouwonderzoek](#)) is a policy platform with the participation of different actors (Farmers Union, Universities, Experimental Stations, Research Institutions, Innovation Broker) that meet twice a year in participatory workshops.

The Platform for Agricultural Research unites the universities (KULeuven and UGent), the Institute for Agricultural, Fisheries and Nutrition Research (ILVO), the colleges (HOGent and KHKempen), the practice centers, the agricultural organizations (Boerenbond, Algemeen Boerens Syndicate

and Bioforum), the Department of Agriculture and Fisheries, the Department of Economy, Science and Innovation and the Flemish Agency for Innovation and Entrepreneurship (VLAIO).

This Platform acts as a sounding board and point of contact for agricultural research and it is the forum for consultations and agreements:

- between agricultural research institutions and agricultural policy with a view to implementing innovation policy and encouraging entrepreneurship in agriculture;
- between agricultural research institutions and the agricultural sector for the best possible mutual knowledge transfer and use of knowledge;
- between agricultural research institutions with a view to optimum coordination.

II. *Planned types of interventions to support the AKIS implementation*

Still, the processes towards the AKIS strategic planning in the MSs are at a too early stage to present a detailed list of the expected interventions which should possibly support the AKIS implementation.

Nevertheless, some key concepts were persistently arisen during the interviews across the MSs:

- simplification of administrative procedures,
- higher interconnectivity between the different types of interventions which can support the AKIS implementation,
- major use of digital infrastructures to support the knowledge flows within the AKIS,
- strengthening of the dissemination of innovative and practical solutions, to promote their scaling-out and scaling-up along the supply chains and the agricultural systems,
- better organization of the farm advisory system.

The enhancement of the information on innovations to the large public, through more communicative tools (booklets, videos, I-platforms, I-forums, events, etc) is also considered in some MSs an issue to be tackled in the AKIS strategic plans (e.g. IT, ES, EL, HU).

With regards to the planning of specific interventions, MSs confirm their interest on all the measures which are primarily devoted to support the achievement of the transversal priority of knowledge and innovation transfer in agriculture of the RDPs 2014-2020 (namely, vocational training, setting up and use of advisory services, cooperation for innovation, investments). Furthermore, a more stress respect to the past, is given to the potential of life-long learning, of peer-to-peer activities among farmers, training the trainers on innovative perspectives of the research, and of the digital platforms and reservoirs to enhance knowledge flows.

It is worth to note that, few MSs show attention to innovative methods to implement the above-mentioned types of interventions through increasing their efficacy. These methods seem to draw from the cross-visits and living labs which characterize the implementation of some recent H2020 thematic networks and research projects, such as, for example, FARMDEMO, NEFERTITI, PLAID, RURAL LAB, AGRILINK, AGRISPIN and others.

For example, in Spain, it is expected the support to BioLabs and Living Labs which are private initiatives for local innovation involving a variety of local actors (farmers, municipal authorities, companies, etc.).

In some MSs, already-in-use knowledge and innovation infrastructures (digital platforms, trans-disciplinary networks, etc.) will be integrated to the national plans to help the effective interaction within the AKIS and maximizing the impact of the planned interventions.

In Lithuania it is envisaged to build more effective AKIS knowledge flows upon the digital platform denominated “InnoGates” which includes researchers, advisors and farmers and it is the result of a current operational group financed the national RDP.

Similarly, in Spain the Catalan region will make use of the agri-food and rural innovation network “Xarxa i-Cat” which, as part of the broader virtual community of the Catalan agricultural, food-industry and rural world, within the RuralCat², is “the main means of disseminating the results of innovative initiatives and projects in the Catalan agri-food sector. It acts as a driving force for innovation in the agro-food and forestry sectors and facilitator of knowledge between science and practice and favoring the transfer of knowledge and opportunities between farms, industries, researchers and technicians in the sector”. In fact, Xarxa i-Cat includes useful on-line services as, among the others, a networking space, information on the innovation projects and their results and technical assistance.

Structuring and enabling the AKIS

AKIS governance and actors

The governance of the AKIS, depending on the different approaches and infrastructures planned by the MSs, will be mainly structured around a vary of bodies: the National Rural Networks (NRN), the national/regional research institutes and the universities. In few MSs the agricultural chambers will also play a key role in AKIS coordination.

All these are widely recognized to have most the potential to enhance the AKIS at Member State/regional level and to promote at the best the knowledge flows, based on their fully knowledge of the state of the art and the wide interconnections with the respective actors.

In few cases, the AKIS coordination functions are even delegated to national research institutes/centres (i.e. BG, CRO).

At institutional level, depending on the policy settings in the MSs, different Ministries will be involved in the coordination of the AKIS. In general, the interviewed appointed the following ministerial competencies to be involved in the AKIS coordination: agriculture, fisheries, rural affairs and food; environment, tourism, research and education, economy affairs.

The functions of the AKIS coordination bodies are still less defined, vague in the description of the tasks and mostly related to the general role of the public administrations and policy makers to set the scene and enable the environment for the effective AKIS implementation.

However, some insights from the interviewed were arisen in relation to ensuring knowledge flows, relational dynamics, common vision and integration of the advisors within the AKIS.

Among the others, the main functions ascribed to the coordination bodies are the followings:

- provision of an AKIS platform, subdivided in focus groups on thematic level, also by using already existing cooperation (e.g. AU).

² <https://ruralcat.gencat.cat/>

- provision of more and new tools to achieve knowledge capitalisation and visualization and innovation take-up. Specific reference is made to the establishment of digital platforms and reservoirs (e.g. ES, IT, HU).
- Enhancement of the knowledge flows within the AKIS through facilitating the interconnection between AKIS actors and strengthening the capacity of farmers to access to new knowledge (e.g. HU, FI, IT, ES)
- governing the cross-fertilization between different CAP-interventions financed by national and by EU funds (e.g. FI)
- establishment of transdisciplinary advisory & monitoring groups (research, Universities, communities) to steer the AKIS implementation (e.g. EL)
- provision of E-Learning platforms (EL)
- organization of Peer to peer events for farmers (EL).

Box 5 – The AKIS coordination body in Aragon Region (ES)

The Platform for Agricultural Technology Transfer and Innovation acts as AKIS coordination body, plays the role of enhancing AKIS and knowledge flows between AKIS actors with the following actions:

- 1) Inform and advise the Management Authority in relation to the application of measures 1,2 and 16 of the RDP.
- 2) Participate in the development of regional plans and strategies related to the purpose for which it is constituted.
- 3) Promote citizen participation in the measures related to the transfer and innovation within the framework of the RDP.
- 4) Develop the necessary actions to guarantee the coordination of innovative and transversal measures within the framework of the RDP.
- 5) Advise the Management Authority in the implementation of actions aimed at achieving models of productive and sustainable agriculture.
- 6) Propose to the Management Authority the development of studies or specific proposals to be funded with measure 20.
- 7) Inform about other matters that may be submitted for consultation by the Director with competences in Rural Development
- 8) Promote actions for dissemination and communication of specific actions of the measures indicated in point 1.

In general, the AKIS relations will be not governed through formal agreements. On this regard, the most of the MSs mention the setting up of informal working groups, possibly set upon CAP specific topics, which are intended as more effective to achieve a participatory and smooth dynamization of the AKIS, based on knowledge circulation and exchange.

A semi-formalized system will be in Ireland where, even if the relations within the AKIS are not formal, the roles and functions of the AKIS coordination bodies are already defined as part of the wider framework of the national strategy Foodwise 2025. Particularly, the coordination bodies will take responsibility for specific actions and for reporting on these quarterly to the High-level committee throughout the life of the strategy.

Differently, a well-formalized system is envisaged in Bulgaria, where the AKIS will be governed by the National Agricultural Advisory Service (NAAS), which has already established formal agreements with a relevant number of actors.

As well, in Hungary an AKIS operates working group since 2017 and it consists of ~100 AKIS actors from the agri-food sector (representatives of research institutes, universities, advisors, farmers, NGOs, the Ministry and the NRN) at national level to discuss AKIS related issues, share experiences, and strengthen the links between actors. Meetings are hold on a quarterly basis.

With specific reference to the methods and tools to apply to facilitate the knowledge circulation and exchange within the AKIS, the MSs mention the opportunity to establish both digital platforms and face-to-face sessions.

Box 6– The AKIS coordination body in Slovenia: Agricultural and rural development council

The establishment of the new coordination body “Agriculture and Rural Development Council” is envisaged to identify and monitor the situation and coordinate activities in this field. This council will be an important consultative body, its role and importance will be defined by law. It will consist of representatives of the potential end-users appointed by individual institutions representing interests of farmers and other non-governmental structures, heads of knowledge transfer institutions and government.

Box 7 – The role of the National Agricultural Advisory Service (NAAS) to support knowledge flows in Bulgaria

One of the main activities of National Agricultural Advisory Service (NAAS) is to support the transfer and application of scientific and practical achievements in the field of agriculture. That improving the relation “research - agricultural advisory - agricultural business s” and support the transfer of knowledge, technologies and innovative solutions into practice. To implement that activity NAAS has signed over 20 contracts and framework agreements with research institutes of Agriculture Academy, universities, applied research organizations, industry organizations and other institutions and experts.

Transfer of scientific and practical achievements in the field of agriculture is carried out in the following main ways: (i) Providing direct advice to farmers, (ii) Conducting information and training events, (iii) Dissemination information and innovation news in the field of agriculture through "Farming circles".

Annually, NAAS conducted over 120 information and training events to train farmers, which lecturers of the information and training events, besides experts from NAAS regional offices are leading Bulgarian scientists in the field of agriculture. Each of which are attended by 30 to 50 farmers.

Box 7 – The Dutch system

The Dutch AKIS is a very dynamic system and a lot of the organizations are the result of mergers, reorganisations or splits from previous organizations (Hermans et al, 2011).

The Dutch AKIS experiences a great crossbreeding of functions with respect to the classical roles: the actors who traditionally do research have begun to provide advice services, advisors may perform applied research, the university works as a facilitator in innovation processes, etc. This aspect makes it difficult to have a comprehensive and clear profile of the players involved. In addition, the geographical boundaries of the AKIS actors are not well defined, due to the increasing internationalization that concerns all the players without distinction (Caggiano, 2014).

The Ministry of Agriculture, Nature Conservation and Food quality, in particular the Department of SKI (Strategy Knowledge and Innovation), is primarily responsible for the governance of the Dutch AKIS. In 2011 the government introduced the top sector policy. The top sectors form a new strategy to better link research and education to the wishes and demands of the business sector. Its governance is tripartite and coordinated by the government, business life and knowledge institutes. Publicly financed agricultural research is still predominantly being executed by Wageningen UR (which functions independently from the ministry), followed by the University of Utrecht who has a faculty for Veterinary Medicine. Many experimental farms have been closed or relocated. The ones left also have to work now on a more commercial basis, aiming at research that cannot be done in individual 'normal' farms that lack these research facilities. Some of the infrastructure have also been privatised and commercial experimental stations have also been established, for instance with regard to the cultivation in greenhouses (Hermans et al, 2011).

Next to Wageningen UR and the University of Utrecht, a variety of other organizations, including public, private and non-profit institutes, carries out research in agriculture and food production. For some, research is their main task, while for others, it supports their main task. A distinction has to be made between:

- public research services or independent research administrations with legislative tasks (e.g. the Netherlands Bureau for Economic Policy Analyses and Statistic Netherlands);
- hybrid research organizations which have a public basis (lump sum contract research and/or education) but also operate commercially (e.g. universities and DLO);
- commercial research institutes that operate on a commercial basis (NIZO and Louis Bolk Institute).

Historically there is an intensive cooperation between the private sector, the scientific institutes and the government. Friesland-Campina is the largest Dutch dairy cooperative and employs approximately 400 R&D professionals. Private agricultural companies with research centres are mainly found in the Food Valley, a regional agri-food cluster in the region surrounding Wageningen and concentrated around Wageningen UR. There are several organizations supporting and facilitating knowledge and innovation, such as academic libraries, RVO (Netherlands Enterprise Agency, the Paying Agency), NARCIS (the science portal of the Royal Netherlands Academy of Arts and Sciences that lists research organizations in the Netherlands) and Statistics Netherlands that collects, edits and publishes statistics for practice, policy and science (Caggiano, 2014).

The potential of education/capacity building

The exploitation of the potential of the education/capacity building is generally considered as crucial to support the well-functioning of the AKIS and to strengthen the knowledge exchange between the AKIS actors. On these regards, a relevant number of the MSs demonstrate a certain degree of awareness in envisaging relevant initiatives which will interest the whole education and vocational chain, from the primary schools to the higher education until the lifelong learning.

According to the MSs education and capacity building need to addresses both the farmers and the advisors.

The envisaged initiatives are mainly aimed at creating connections among the educators, the farmers and the advisors, to achieve more tailored educational and vocational programs on farmers' needs for capacity development on specific topics (e.g. digitalization), for faster innovation up-take and for more responsive and update advisors.

In fact, the gap between farming system needs and the offer for vocational training available in the schools is a broad concern in many MSs (e.g. IT, ES) and it is mainly due to the lack of specific assessments on farmers and advisors and of coordination by the competent authorities.

In this context the role of the NRN ca be crucial to set the scene for a productive dialogue between the different actors and, also, to facilitate collaborative working for better educational programmes.

For example, the NRN in Italy has carried out a participatory work with the national professional association of advisors and some farmers based associations to assess the needs for training of advisors and to develop a tailored e-learning course which is freely accessible on line.

Along with the focus on demonstration farms and peer-to-peer learning, some MSs also highlight the importance of applying innovative methods to education and vocational programs, which should include learning by doing approaches to (new practices, demo-farms, farmers' exchange).

Some experiences will be certainly reiterated and further developed during the next programming period (the Green Pact in box 9 and the vocational training for the digitization strategy in box 10).

For example, from Ireland it is expected to “combine effort in providing training options for graduates who intend to pursue a career in farm advisory, competence development programs for existing advisors using the CECRA³ framework and the updating of young farmer training to include more problem-based learning and more interactive and participatory approaches”.

Another exemplary experience is reported from Slovenia and it regards the compulsory introduction of educational components for aligning the education programmes in primary schools to emerging policy topics (food, the multifunctional role of agriculture, natural resources and rural areas). Here, with the aim of popularizing vocations in the field of agriculture and rural areas a systematic setting up of food circles is being conducted in primary schools by experts working in the field of agriculture and in the education system.

³ CECRA competence development programs for advisors and consultants in rural areas of Europe. <https://www.cecra.net>.

All these expectations, of course, imply the coordination at national/regional of the different public policies having competences on the educational system on one side and, on the other side, the vocational and lifelong learning.

BOX 9 – The Green Pact for continuous innovation in education in Netherland

(NL) Groen Pact ('Green Pact') is a platform for collaboration, knowledge sharing and acceleration. The second phase of Groenpact focuses on current social themes: what will climate challenges, circular agriculture, liveability and competitiveness mean for the green sector? Groenpact is about attracting and retaining talents, learning and innovating. Groenpact focuses on continuous innovation in education, innovations in practice and responding to the changing labor market.

The GroenPact is joining the business community, education and government to further strengthen the green knowledge and innovation system in the Netherlands. Together they work to realize the joint ambition to remain an international leader in resolving major global and regional issues in the field of nutrition, sustainability and quality of life.

The six lines of action are: innovation, labor market, international, cross-overs, Lifelong Learning and image of the 'green sector' including agri-food.

BOX 10 – The integration of vocational training in the Digitization Strategy in Spain

As an example, the Digitization Strategy for the agri-food and forestry sectors and the rural areas considers the education and capacity building as one of the main areas for intervention. At this regard the Objective 1 is oriented to reduce the digital divide through actions oriented to enhance the capacities of the sector and the inhabitants of rural areas. This included three specific measures: M1 Drive the inclusion of digitization in formal training through enhancing and driving the dialogue and the coordination with the competent authorities at national level; M2 Lifelong training and competences acquisition; M3 Attraction of young and women.

Vocational training integration in the regions:

In Aragon region there are 11 professional/vocational schools providing basic vocational training related to agrifood areas of interest. There are 13 schools providing post-secondary school training and 7 centers providing higher professional training on agrifood related topics. In total every year there are around 904 graduates from the system. However it is a broad concern of the authorities the gap between farming system needs and the offer for vocational training available in these schools. There is direct contact with the Directors of the schools, but a lack of better coordination with the competent authorities at regional and national level.

In Catalonia, there exists a network of 14 Agricultural Schools, 10 Secondary Schools with some specialization in agricultural training and many Agricultural Organizations, Universities and other institutions..., all of them involved in Vocational and Lifelong education in the agri-food sector under the coordination of DARP. For the last five years or so, on-line courses have been successfully implemented. Yearly over 10.000 persons follow some type of training in Agricultural Schools. In general in Spain it is missing capacities for lifelong training with a farmers' needs demand and the development of a continuous feed-back to create productive dynamics.

Integration of the advisory services within the AKIS

The effective integration of the advisory services within the AKISs is undoubtedly seen as key for its well functionality. To this respect MSs envisage a very early involvement of advisory services during the AKIS strategic planning, to start with a better assessment of their needs, to share visions and expectations and to define common goals together with the other AKIS' actors.

All the MSs point the need of advisors to strengthen the networking activities to increase their connections within the AKISs.

The solutions envisaged by the MSs to achieve a better integration of advisors within the AKIS are varying depending on their own systems.

Where the advisory services are mainly provided on private basis, the MSs are establishing participative solutions which have different degrees of formalization.

This is the case, for example of Hungary, where a specific National Agricultural Advisory Committee has been set up, with a limited access to membership, based on formal invitation, and it includes representatives from the ministry of agriculture, universities, research institutes, advisory service companies and relevant authorities with National chamber of agriculture (NAK) as secretary. Its operation is quite formal but has a high-level legitimacy to discuss issues in relation to the advisory support scheme, and FAS operation and development (such as the development of the training and/or the classification system). It functions as an advising body for the ministry in this field.

Similarly, in the case of Catalonia and Aragón regions in Spain, the Catalan Council for Agri-food Innovation and the Aragon Agricultural Technology Transfer and Innovation Platform have been set up, based on the methodology used for the PRITAC (the Strategic Plan for Research, Innovation and Agro-food Transfer of Catalonia 2013-2020), to create participative spaces for representatives from professional farm associations, cooperatives, enterprises, unions, universities and research institutes, to agree on a common roadmap to the AKIS plan. The members of the Council will meet on periodic basis in a series of meetings.

In some MSs, the Agricultural Chambers play already a key role in providing extension and innovation support services (e.g. AU).

With reference to the types of interventions foreseen to better integrate the advisory services within the AKIS, these are all aimed to: (1) strengthen the interaction with the farmers and the researchers (cycles of meetings with farmers; contracts with research institutes); (2) develop professional capacities and, (3) enhance the access of farmers to information and knowledge (newsletter; webpage, virtual communities, digital platforms).

For instance, in Catalonia since the setting up of the private FASs, their objective is to strengthen interconnectivity of different advisory entities, of advisory bodies and Universities and Research Centres and of advisory bodies and the Administration. This is considered likely to empower advisory bodies, to improve their visibility and to facilitate their role as innovation brokers. To this end, the establishment of tools such as online platforms, virtual communities, training is largely promoted.

Differently, in Aragon they have a FAS provided by private organizations based on the (EAFRD regulation for tendering this services), with a support from the Public Administration through the recently created service for Agricultural Technology Transfer and innovation.

Innovation support services

The MSs mostly affirm they can rely on the presence and interoperability within the respective AKIS of already in place innovation support services.

This is mostly due to the European policy for research and innovation which, across the last two programming periods, certainly contributed to the setting up of new actors, mostly private and farmer-based organizations. These cases are registered, for example, in vary regions of Italy. Here a multitude of actors have been set up or consolidated their functions to support multi-actor innovation processes which act as innovation (e.g. [Vinidea](#), [Open Fields](#), [Rete dei semi rurali](#), [ISVEA](#), [Cadirlab](#), [Elp Coop](#), [AIAB](#)).

In other cases, the still existing regional research and development agencies have been reconfigured to act as innovation brokers, given their well-grounded knowledge of the respective territories and their research background. [ASSAM](#) in region Marche (IT), for example, has been appointed as regional innovation broker and, among teh others, organizes cycles of info-days and open-days to make actors connected, to manage the [Innovamarche](#) digital platform, which is used as a virtual community to exchange knowledge and expectations on innovative solutions, and to monitor the operational groups (M16 of the Region Marche RDP 2014-2020).

Differently, in some MSs the innovation support services are provided by farmers-based organizations. This is the case, for instance, of the Netherlands, where [ZLTO](#) is the dominant provider which largely supports and simultaneously interacts and coordinates innovation processes closely with other service providers, and of Hungary with the [NAK](#) (national chamber of agriculture).

In Catalonia, [ACCIÓ](#), the Catalan Agency for Enterprise Competitiveness, provides advisory service for innovation, development of R&D projects and technology needs of enterprises. The same is for the [Catalan Cluster Network](#), composed of 30 clusters that represent different businesses of Catalan industry.

Widely, the MSs declare to rely on the national/regional research institutes which over the time increased their capacities to engage collaborative innovation pathways.

These cases, for example, are mentioned for Spain, for regional research institutes, such as INTIA, IMIDA, IVIA, IFAPA, CICYTEX, CTAEX, IRTA, or CREA, and in applied research institutes or technology centres, such as CTFC (Forest Science and Technology Centre of Catalonia) or EURECAT Technology Centre. As well, in Italy, among the others, it can be mentioned [CREA](#) (Council for Agricultural Research and Economics) and [FIRAB](#) (The Italian Foundation for Research in Organic and Biodynamic Agriculture) which are also engaged in several operational groups.

Finally, many MSs appoint also the National Rural Networks as actors which provide innovation brokering through connecting the actors within the AKIS and providing a set of well-suited services to boost innovation all along the value chains (e.g. IT, HU).

Training of advisory services

Many MSs plan to require the continuous update of advisors based on a compulsory and regular training as part of the accreditation of advisors to the public registers. In fact, this is seen as very crucial to increase the professionalism of advisors towards a major quality, transparency and impartiality in service provision. In some MSs these rules are already in place (e.g. HU in box 11).

BOX 11 – The training system for advisors in Hungary

In Hungary the trainings are functioning as an eligibility criterion to obtain a permanent status in the public registry or to allow an application for supports. The training system for advisors is articulated as follows:

Basic training: compulsory for those who have been accredited to the public register of advisors. This course covers the following topics: (1) advising methodology, (2) operation of the farm advisory system and the support scheme, (3) how to use FAS IT systems, (4) basics of the use of digital technologies. The training contains a 2-day soft skill training (mainly communication) while the advisors' performance is assessed continuously. Afterwards, there is a 1-day long consultation based on the learning materials that can be reached through the e-learning system. At the end, the advisor needs to pass both oral and written exams where the point is to prove that she/he is well-prepared from methodology and can solve the related case studies. Afterwards, these two are complemented by an online test too for the other topics. If the advisor does not accomplish the basic course with the related exams until the end of the year which followed the date of his/her registration, he/she loses the active status in the registry, cannot provide service until he/she fulfils the criteria.

E-learning course courses: compulsory for those who would like to be eligible for the CAP support. The exams consist of on-line tests regarding three topics chosen from the list set in 1305/2013 EU regulation (Art 15).

Yearly compulsory courses: as described upper, the ministry/NAK can ask for the accomplishment of such additional courses. The advisors who are affected has to take a preliminary test to check if they really need the course to improve themselves. If they pass the test with a result of at least 70%, they are exempted from taking the course. The others have to take it however: in e-learning system with online learning materials and with the possibility of personal consultation. The related exam need to be passed also online, without personal presence, in a limited time however.

Optional trainings: They are one-day long courses, maybe complemented with a test/exam.

The trainings with the same content are usually organized more times in a given period, but elsewhere (as a roadshow) to be able to be available for all the advisors in different geographic locations.

Contents of Advisory services: beyond regulatory frameworks

About the content envisaged for advisory services in addition to that required by the proposed Regulation, Member States still express general views.

In general, they argue that there is a need to ensure an adequate coverage of the current needs of farmers and of specific issues which relate more to the overall objectives of national and European agricultural policies.

Member States are also interested in developing new digital, social, networking skills and tools for the provision of advisory services.

Approaches to ensure quality, transparency and impartiality of the farm advisory services

Quality, transparency and impartiality of the farm advisory services are largely treated by the MSs almost indistinctly.

The issue of impartiality is still not well defined and the solutions to ensure unbiased consultancies to farmers regard mainly the introduction of processes of certification which should, at least, guarantee the provision of highly qualified services. Besides, the MSs still did not achieved a shared vision on the impartiality of the advisors.

In fact, in some MSs the impartiality will be treated by excluding the advisors who have commercial interests from the accreditation to the public register of the advisors. Other MSs will open the accreditation to all the advisors who fit the selection criteria even if the ones who have commercial interests will be not access to the CAP support.

Doubts regard also the effectiveness of whatever solutions against the possible conflicts of interest of advisors, since their motivations especially in the private service world are not fully controllable and they can use their farm advise to support other more lucrative activities of their companies e.g. farm accountancy and taxation services, estate agencies, suppliers of farm inputs, legal services (e.g. IE).

Other solutions proposed by the MSs regard:

- the availability of the advisors to perform free of charge services to farmers,
- the absence of linkages with a company selling products,
- the use of public extension services,
- the non-allowability to provide advice on the field the advisor has some commercial activities/connections (e.g. FI),
- the mutual trust among advisor and farmer formalized by a declaration of absence of conflicts of interest or a confidentiality agreement (e.g. IT, LI),
- the field-based control of Certified Advisors' services (e.g. EL),
- the rules set by a specific national legislation (e.g. SI; SW)
- the institution of a code of conduct to be signed by the organizations willing to be recognized as FAS.

A matter of interest for the Member States is also the transparency about the respective fields of competence of the accredited advisers in the public register, so that farmers can have the information they need to choose the advisor best suited to their needs for support.

In any case, most of all, the high qualification and well-grounded experience of advisors are largely considered as crucial to rely on their credibility and impartiality.

Planning the Knowledge exchange and information

Due to the early stage of AKIS planning processes across the MSs, the application of article 72 of the proposal for regulation COM(2018)392, in general, is under development.

In principle, some MSs state that the organization of the advisory services within the AKIS basically will follow the current settlements, unless some ameliorative adjustments which are meant to overcome the barriers and rigidities which caused the scarce level of implementation of M2 during the programming period 2014-2020.

Many MSs state that a procedure of official registration of advisors will be implemented and this will be based on selection criteria which refer to their skills and competences. The accreditation in the official register will be the *conditio sine qua non* to be eligible to the CAP support.

In some MSs the inscription to the register imply the compulsory participation of advisors to training sessions (e.g. FI, IE and others) along with other forms of systematic updating of professional competences (e.g. advisory network membership).

In regionalized MSs, the organization of the advisory services under art. 72 will be set according to the different systems (public, private, semi-public advisory services) and approaches to extensions services.

An issue raised in regional systems is the define common rules or, at least minimum standards applicable for the organization of the advisory services , to homogenize, for example, the selection criteria for the registration of the advisors, their access to the CAP support and the transparency, to avoid possible disparities and gaps among the regions, in terms, for instance, of the quality of service to provide to farmers, of fees applicable to the different types of services and of the basic training to attend.

III. *Approaches, methods and tools to monitor and evaluate the AKIS implementation*

In line with the system approach widely applied to the AKIS strategic planning process, the MSs envisage the use of participatory approaches to monitor and evaluate the AKIS implementation and highlight the importance of conducting on-going assessments to help self-reflection and common understanding among the actors (e.g. IT, FI).

As well, it is emphasized the need to identify early in the AKIS plan sensitive indicators to monitor and assess on regular basis the progress of its implementation during the programming period.

Also, MSs promote the implementation of regular surveys on farmers to assess the quality and the effectiveness of advisory services provided.

In Spain, for example, following the same approach that has been applied for monitoring the Digitization Strategy for the agro-food and forestry sectors and the rural areas, the predefinition of different types of indicators (inputs/outputs, results, impacts) will be aimed at assessing the AKIS plan implementation and its performances during different stages along the programming period. Through this set of indicators are expected to take into account the clarity in the AKIS plan delimitation, the simplicity in its application and the representativeness in terms of the settled objectives and the challenges of the focal group. Thus, through these indicators, it is intended to collect the degree of transparency required to achieve the selection of the best possible actions to be funded.

In the following, a list of possible relevant indicators has been drawn from the interviews across the MSs (box 12).

Box 12 - Examples of indicators proposed by the MSs for the M&E of the AKIS

- N. of OGs
- N. of advisors participating to OGs
- N. of group discussions
- N. focus group meetings
- N. if meetings and workshops
- N. of events for transfer of knowledge and innovations
- N. of demonstrations on farms realized
- N. of provided advisory services
- N. technologies and/or processes brought to market
- N. of operative groups under AGRI-EIP
- N. of different actors involved
- N. of networks created for development and distribution of knowledge
- Share of the sector's enterprises participating in innovation cooperation activities, out of the total number of the sector's enterprises (%)

Chapter 3. Interlinkages between Research and Innovation policies and the CAP

Multiactor approach (MAA) projects have in particular strengthened multi-actor networks at EU level. The MAA puts into practice the “interactive innovation model” which is promoted by EIP-AGRI. It means that knowledge is co-created between practice, scientists, advisers, enterprises, NGOs, etc. This involves looking at different dimensions, including technical, organizational and social aspects which help to bridge the gap between science and practice, applying a “systems approach”.

The interactive innovation model is also used by EIP- AGRI Operational Groups, who work on tackling a specific problem or opportunity on a local, regional or national scale and bring together partners from several different professional backgrounds.

The CAP regulation proposal presented in June 2018, states that “Synergies between the EAFRD and Horizon Europe should encourage that the EAFRD makes the best use of research and innovation results, in particular those stemming from projects funded by Horizon Europe and the European Innovation Partnership (EIP) for ‘agricultural productivity and sustainability’, leading to innovations in the farming sector and rural areas”. In this study we have looked into the experiences learnt in the period 2014-2020, where more than 1000 million euros have been invested for MAA projects where different networks and synergies have been explored to realize in an improved innovation process tacking stock of the different initiatives developed both at EU and regional and national level.

I. *Administrative burdens*

Within H2020 the major problem is to reach the end user for strengthening the linkages between research and practice, in particular the farmer, as they need extra motivation and incentives are needed to compensate the absence from their work. It is also an extra administrative burden to involve different actors, farmers are not keen in participating in projects because of the administrative burden.

Among others, rules and regulations for H2020 projects are considered complex. But there are actually no real problems with administrative burdens as long as the partners from practice are

actively and well supported in this and everybody realizes that they have to account for a minimum level of administration if public money is involved.

Some private companies simply avoid public financing (based on their experience within some locally-managed financing programs or based on the general perception), considering them too complicated to handle.

It is also considered that communication from H2020 projects to national/regional level is one of the main barriers.

Another administrative burden is the need for specialist support services with acquired experience in administration and project management.

The lack of flexibility and the inefficiency of communication and dissemination activities are a main barrier. At application level it is very difficult to identify the best initiatives / opportunities / mechanisms to disseminate the results and increase the impact of the projects, so it would be good to allow for greater flexibility during implementation.

In Bulgaria there aren't major administrative burdens for strengthening the linkages between research and practice within H2020. Maybe one barrier is that under H2020 is not possible to be eligible as direct costs – costs for payments of demonstration farms to be host of demo or other H2020 project events (rent costs). Also limitation of Direct personnel costs only for members of Consortium teams which implemented the projects but sometimes is necessary for some events under the projects to be hired (only for the event) moderators and presentators or even farmers.

In Estonia, the situation is already changing thanks to the need to assess the TRL of a funding measure and/ or project. TRL as a concept works to change the mindset that research and practice come from different planets.

One of the problems is also that dissemination is not always regarded as an eligible research project cost (only actual research activities are eligible).

In Hungary, in general, all the legal documents and project administration is still something new for most of the Hungarian organizations participating now at H2020 projects. Both the legal and financial framework still need to be explored by the professionals in charge who are rather afraid of international projects, because of language barriers and as the rules look complicated (length of AMGA). So the involvement of practitioners (who are usually newcomers at the same time) in MAA projects as consortium members is rather difficult.

If it is about the participation / contribution of farmers to an event, workshop or other project work, the compensation is seen still as an issue.

If it is not about participation, but rather hosting other farmers as a demonstration farm, for example there are already good solutions for the compensation: the demonstration farms can be funded by an event organizing company which is selected through public procurement.

In Lithuania, the main administrative burdens are: High administrative burdens of multi actors' projects and low success rate of project proposals; existing networks are not dominated by research performing organizations; low visibility of researchers from Lithuania, there is no internationally recognized networks, research institutes, universities or any other associations.

II. *Foster participation of large number of end users*

The most effective in fostering the participation of a larger number of end-users is allowing cooperatives or associations to participate as substantial full partners in the project and that they use their events to include their members i.e. end-users. E.g. through farmer's field days, demonstration projects, etc.

Mechanisms to foster the participation of end users are mainly dissemination and knowledge transfer ones. Like is performed in Poland with the participation in the annual agricultural

innovation forum, seminars during the major national agricultural fairs, poster sessions during major conferences with participation of end users and advisors. Advisors' capacities to disseminate on local basis are also recognized.

With the strengthening of multi actor approaches in recent years we have seen a greater interaction between research and practice, with many non-research institutions (including farmer associations and advisory institutions) participating in H2020 projects. This has been very important to make H2020 projects closer to agriculture and farmer priorities / objectives. Nevertheless, the vast majority of the AKIS players are still unaware of H2020 projects, and there is still a long way to go to make dissemination / communication and valorization activities reach the whole sector.

There are other ways to foster the participation, mainly through: EIP-Agri Seminars and Workshops, participation in expert groups (e.g.: EIP-Agri Focus Groups), so as in other more passive mechanisms (e.g.: worksheets, websites, publications).

It is considered that accessibility is the key for knowledge transfer to the broader community, policy-makers, the industry, farms, advisors etc., although the language barriers still exist.

III. *Synergies H2020-EAFRD*

In Estonia, Innovation network disseminates also H2020 news, there is an exchange of information between NCP and Innovation Network, the Innovation Network representatives attend the information events organized by H2020 NCP, etc. But it's not a regulated or established system.

In Belgium-Flanders Agrolink Flanders has organised several H2020 brokering events (internal). Participation in H2020 projects is often looked for when the partner institutions also have similar projects running at national/regional level, especially thematic networks.

In Greece, synergies have been developed through facilitating thematic exchanges between rural development stakeholders, sharing and disseminating the findings and promoting networking of Local Action Groups.

In Hungary, in the field of agriculture there are no synergies developed yet.

Not that relevant examples, but what may be mentioned are the national assisting supports to enhance participation in H2020 projects of Hungarian organisations:

- for preparing a H2020 project proposal as consortium member: 5,000 EUR
- for preparing a H2020 project proposal as a coordinator: 10,000 EUR
- for preparing for the 2nd phase of an H2020 SME project proposal: 13,000 EUR

In Lithuania, the synergies between H2020 and national funding are mostly initiated by MITA – research and innovation executive agency that is organizing brokering events of H2020, and NRN and ministry of agriculture and ministry of finances that are playing the key role in setting up the innovation development priorities, measures and instruments.

In the Netherlands, the ministry starts with what is needed in terms of research and innovation. Then is decided to fund it by RDP, Horizon 2020, national government or local government. It is not aimed at the instruments but aimed at what is the most efficient way to solve the needs. The burden for successful AKIS – lots of participants, funding is project-oriented and do not ensure long term results.

Relevant thematic H2020 networks are mapped by the NRN / National contact point EIP-Agri. At thematic meetings that the NRN / national contact point EIP-Agri organizes, there is an opportunity for thematic networks to exchange results with operational groups.

In Poland, there are other sources of financing projects, which has gained seal of excellence. There is also possibility to receive national funds for preparation of the H2020 application.

The NCP's are organizing a lot of events (brokerage and information days) and offering their broad scope assistance in projects' preparation and searching for partners.

The representatives of NCP are also taking part in meetings organized by the MARD for research and advisory services. (Meetings organized under the National rural Network).

In Portugal, there are no specific systematic initiatives promoting synergies. The most impactful initiative was the Agri Innovation Summit (<http://www.aislisbon2017.com/>) that joins OGs and international projects, at European level, in Lisbon. It would be very important to increase and develop more of these international initiatives and give opportunities of OGs participants to engage with international players.

So as for thematic meetings for advisors are important to exchange information and experiences, which could be useful for advisors. Thematic conferences with participation of different stakeholders, during which good practices are presented, could be a good opportunity for linking OG and multi-actor Horizon 2020 projects.

It is relevant to mention again the SIR network in Poland that is operating in the framework of the National Rural Network. Current linkages with Horizon 2020 multi-actor projects are relatively weak, also because of the level of participation in Horizon 2020 projects with multi-actor approach. There is a room for manoeuvre since the advisory services are engaged in operation of the SIR network and increase their participation in Horizon 2020.

In Slovak Rep. Research and Innovation Program (ESIF) supports Slovak organizations in preparation phase for H2020 projects with condition that proposal must be evaluated over threshold (3000 eur for Lead partner and 2000 eur for partner organization).

Nowadays with more H2020 projects approved with various Slovak partners, many synergies are being developed, e.g. co-organization of events appear more and more with various national/regional activities, preparation of strategies and action plans are being coordinated with regional authorities, also across various sectors. Implementation of H2020 projects helps to improve policy, research and business environment by introducing new tools, business models, strategies.

IV. *Incentives or funding mechanisms to allow farmers to participate in innovation projects*

In all the EU countries and regions, OG's have been the most successful formula that have allowed to ignite the process to start working in innovation projects to farmers, farmer's associations and cooperatives. Although there are other funding mechanisms like in Belgium-Flanders, where there are as thematic calls for financing investment projects at farms.

In Finland, in France and in Catalonia region in Spain, there is long tradition already before the EIP-Agri of bottom-up development projects in regional level. There was several hundreds of innovative food related multi-actor projects already financed 2007-2013 in which farmers were active partners.

In Finland also, the regional managing authorities are active to network the partners and activating also new partners to participate. This is done by meetings, training and seminars.

In Hungary, out of OG's, there were no financial incentives for that. The Ministry of Agriculture and NAK organized several information events to show the advantages of participating in such projects. Also several good practices for innovation projects in Hungary were collected and published as examples. In addition, the already granted OGs in other EU countries (the first ones) were introduced in a booklet and were invited to an international EIP-AGRI conference to Budapest where Hungarian potential OGs could ask for experience from them.

In most of the cases, however, farmers chose to participate in an OG because of the possibility to get financing for investments. This could have been the main incentive (but built in the EIP-AGRI call itself, not a separate funding mechanism).

In Ireland, OG's as well following on from good examples of LIFE and Interreg projects. It is also seen very promising the idea of Erasmus plus for farmers

In Lithuania, one of the strongest reasons why farmers/ farmers associations/ farmers cooperatives have started to participate in innovation projects is finance mechanisms and attractive partnership forms. The partners bring different knowledge, resources, technologies and tools which is necessary for farmers, that's why they are raising their needs and seeks partnership.

In The Netherlands, support from RDP, support from local governments, support from research. It is as well considered Important for participation to have a lead party who can articulate the innovative project idea well and who is familiar with writing project proposals. In many cases this is an adviser. Only a few farmers took the initiative to make a proposal. The procedure is too complicated for them. The provinces make the calls and do the communication around that. Some of the provinces have a helpdesk for questions about the making of the proposals. And some of the provinces also finance the writing of the proposal and the formation of the Operational Group. This happens while Innovation brokers (private advisors and 1 or a few from ZLTO) are deployed by the top sectors (Agri-Food: circa 10 and Horticulture & Starting Materials: 5). They are primarily aimed at supporting SMEs, answering questions, initiating new activities and organizing network activities. The innovation brokers have an independent role and they are not connected to a knowledge institution. The brokers are 50% privately co-financed. Specific for SMEs is the SME Innovation Stimulation Top sectors (MIT) scheme. The MIT scheme is carried out by RVO (the paying agency) together with the regions (Provinces). There are two types of calls: one for small instruments (knowledge vouchers, innovation advice and feasibility studies) and one for the larger R&D collaboration projects.

In Poland, they have foreseen the possibility to receive assistance under the RDP for the operational groups in the framework of "Co-operation" measure. It is also seen positive the intensive work of brokers, who are linking farmers, researchers and other partners in preparation of innovation projects.

In Sweden, some stronger actors have to act "as bank" since there is no way of advance payment in EIP. However this obstacle implies that these strong actors always want to be involved and hinders some innovations.

Recommendations

For a better structuring of AKIS there are already different on-going (e.g.: Catalan Council for the agrifood innovation in Catalonia region and Network for innovation in agriculture (SIR) in Poland) or proposed (e.g.: National Agricultural Knowledge and Innovation Council (NAKIT) in Hungary and Agricultural and Rural Development Council in Slovenia) initiatives in different EU member states and regions that allow a continuous exchange between the different actors and also their participation in programming and assessment (monitoring and evaluation) of the different interventions towards a more interactive and participatory approach.

For the monitoring and evaluation of the AKIS implementation, the use of participatory approaches are broadly considered in the MMSS. For the best of the process, conducting on-going assessments to help self-reflection and common understanding among the actors, is considered relevant.

For enhancing knowledge flows between all the interested actors, it should be allowed the capacity for the creation of “spaces for co-creation” through living labs, demonstration activities and enhancing the peer to peer exchanges.

In the context of enhancing the role of advisors and their crucial participation in achieving different CAP objectives (e.g.: eco-schemes), this is seen as very crucial to increase the professionalism of advisors towards a major quality, transparency. Training for accreditation and lifelong training with minimum requirements for entry in the system and allow the permanency. Networking and knowledge exchange between impartial advisors (both private and public) should be enhanced.

It should be promoted a common understanding on the impartiality of the advisors. The issue of impartiality is still not well defined and the solutions to ensure unbiased consultancies to farmers regard mainly the introduction of processes of certification which should, at least, guarantee the provision of highly qualified services. Different ideas are proposed to be considered among others: The institution of a code of conduct to be signed by the organizations willing to be recognized as FAS; the absence of linkages with a company selling products; the rules set by a specific national legislation (e.g. SI; SW).

It should be allowed the possibility for advance payments for OG's participants, and promote vouchers and lump sums to allow an equal participation of all the actors regardless their financial and administrative capacity.

The role of EIP-Agri service point for enhancing the internalization and networking between the different actors through: seminars, workshops and conferences is seen very pertinent and need to be enhanced in the following period to give opportunities for OGs participants to engage with international players.

The most effective in fostering the participation of a larger number of end-users is allowing cooperatives or associations to participate as substantial full partners in the project and that they use their events to include their members i.e. end-users. E.g. through farmer's field days, demonstration projects, etc.

Conclusions

From the study we have learned that there is a need for strengthening AKIS policies in EU member states and regions because insufficient connections between advisors, researchers and end-users still exist, although there is increased focus on actions to stimulate interactive innovation in particular since the introduction of EIP-AGRI.

Although EIP-Agri have mobilised AKIS actors and raised the awareness on interactive innovation, a more structured AKIS in countries and regions is still a challenge. The CAP AKIS plans even its development differs from one country to another and is still very preliminary, it can be seen that Governments are already committed to boost the systems towards a more integrated and structured model.

New impartial approaches for advice and innovation support are envisaged, towards more and to improve interaction with farmers, end users and other actors. It is seen a need for strengthening the interactions between public and private advisors operating in many countries and regions. So as for the consideration of commercial advise that in many cases have a strong position towards farmers influence and its interaction with impartial advisory bodies.

There is also attention for more and/or improving training for advisors, including stimulating cross-regional exchanges and developing more interactive roles for innovation. The ERASMUS+ model for advisors exchanges and even for farmers is seen a good scheme for allowing this exchanges.

There is a common vision on the need to continue and further develop EIP-AGRI and the support for Operational groups, including further improvements of procedures such as on-going calls for proposals and more types of calls. Furthermore, more on-farm demonstration activities are demanded to serve multiple purposes for demonstration, validation, places to meet, follow-ups and encounters with individual advisors, including stimulating more cross-regional exchanges.

With the strengthening of EIP-Agri Multi Actor Approach in H2020, in recent years we have seen a greater interaction between research and practice, with many non-research institutions (including farmer associations and advisory institutions) participating in H2020 projects. This has been very important to make H2020 projects closer to agriculture and farmer priorities / objectives. Nevertheless, the vast majority of the AKIS players are still unaware of H2020 projects, and there is still a long way to go to make dissemination / communication and valorization activities reach the whole sector.

Extra efforts in the further AKIS developments are foreseen to target specific groups of young farmers, small farmers and 'hard-to-reach' farmers. Some member states indicated first thoughts on building knowledge reservoirs to enhance dissemination.

Challenges for AKISs in (semi)regionalized countries are tackled in various ways, to be able to better coordinate between national and regional interests. Many MSs indicated the demand for simplification of their administration in AKIS. In most cases MSs want to build forth on existing well-functioning instruments and keep the AKIS actors involved.

It is also planned to (further) involve other actors who are not part yet of the AKIS system, such as other value chain partners, consumers (representative parties) and start-ups, of importance within the digitization process in agriculture.

Finally, the development of Innovation Support Services provided by Farm Advisory Services are considered by a number of MSs and as for the development of new roles within the interactive innovation model, among others promoted by EIP-AGRI.

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Annex 1. Structure of the questionnaire

The generation of new empirical evidence on the linkages between research and practice for the improvement of Member States AKIS in the CAP post-2020. The investigations will be developed around the following questions. Details per MS will be delivered via country experts.

1. In relation to AKIS settings in the MMSS:

1. Which are the MAIN AKIS actors in your Country/Region by type of entity? (please keep in mind the Pro-Akis country report for your country (enclosed)

(multiple choice)

- Universities:
- Research institutes:
- Applied research institutes/Technology centers:
- Agricultural education (schools, higher institutes, universities,...):
- Entities that provide lifelong training:
- Impartial Agricultural Advisory Services,

Public:

Private:

- Farmers' organizations:
- Cooperatives and Federations of Cooperatives:
- Public administrations involved in knowledge and innovation. Indicate also funding bodies:
- Companies for the provision of agricultural inputs including knowledge services:
- Financial entities with specific orientation to the agri-food sector/banks:
- Other organizations (Foundations, NGOs, ...):
- Demonstration farms
- Agrifood Industry (processors etc)
- Distribution/retailers
- Others (Producers' Organizations, Regulatory Councils, Livestock Integrators, Tech suppliers (ICT services, DST suppliers)).

2. How are AKIS actors connected? How is the degree of interactions/knowledge flow among the relevant AKIS actors. Indicate 1 the lower interaction and 5 the stronger interaction. Please if possible, indicate whether the connection is made by: literature; publications; news; seminars; yearly meetings;...

Regarding the above mentioned degrees, please indicate a number for each AKIS actor interaction:

Mention the ways AKIS actors are connected (e.g.:Regular meetings open spaces for meeting (e.g.:discussion groups),...)

3. Are there incentives for enhancing AKIS interlinkages: financial or other incentives, platforms, infrastructures,...? Regional networking?: please choose among the following list (multiple choices)

- Innovation networks (around a sector/subsector/theme)
- EAFRD (OG's and LEADER)
- Cooperatives services
- Advisory groups
- Experimental stations
- Demo farms
- Seminars/Technical meetings
- Sectoral groups in cooperatives and other organizations
- NGO's
- Agricultural exhibitions
- Others

4. Who are the main impartial advisory services in your country/region and their main field of competence:

Adv. Serv. Main field of competence Private Public Mixed Provide innovation support

- Mainly public
- Mixed public-private (Public Adv. Services providing a set of advice (e.g.: on CAP cross-compliance, other CAP issues) and private providing advice on technical-economical aspects
- Private (Cooperatives, farmers associations, independent consultancies,...)

5. Are Commercial Adv. Services (e.g.: suppliers (Syngenta, Basf, John Deere, etc.) influencing other AKIS actors? Please identify which and why/how.

2. In relation to the future strategic development of AKIS:

2.1 PREPARATION OF THE CAP PLAN

6. How your MS is approaching structural analyses of the AKIS. Which methods are put in use to identify the relevant actors? Are/will these actors be involved in the CAP strategic planning (SP)? If Managing Authorities are supported by outside methodological support, who will provide methodological support to CAP SP Managing Authorities to AKIS strategic planning? (Multiple choice)

Evaluators

National Rural Networks

Technical Assistance

Others (indicate)

7. How the MSs will approach functional analyses of the AKIS, how will they plan and assess the knowledge flows?

8. Which approaches and methods are in play to (co)-develop common visions on the AKIS 2021-2027 at Member States/Regional levels?

2.2 CONTENT OF THE CAP PLAN

9. Which interventions are being considered to be planned in next CAP to enhance knowledge flows within the AKIS?

10. How the MS will programme the AKIS by ensuring an active participation of all the relevant actors? Types of measures/meetings/methods in use.

11. How the MS will monitor the implementation of the plan?

12. How the Member States will ensure the effective integration within the AKIS of the public and private impartial advisors ?

13. How will they organize under Art. 72 the advisory services?

14. How the advisory services should be delivered:

1. which advisory content (fields of competence),

2. training for updating competences (obligatory nature Y/N,

3. frequency,

4. number of training hours/year etc),

5. possible transparency or certification approaches

6. how to determine impartiality, etc?

7. What will be the level/quality/quantity of the involvement of advisors during the programming, implementation, monitoring and ex post assessment phases of the future CAP AKIS plans.

8. Will the MSs use consensus-type meetings to involve the advisors and other AKIS' actors all together since the programming phase in the future development of AKIS plans?

15. Which indicators and other tools will be put in use for monitoring and evaluating the AKIS performance to enhance knowledge flows?

16. Which type of bodies have most potential to enhance the AKIS at Member State/regional level?

National Rural Networks

Managing Authorities

Ministries (indicate which)

Public K&I bodies (indicate which)

Others (indicate)

17. Do you have active innovation support services, or plan to set them up in the future?

1. Indicate Which

2. Indicate How

18. Which roles will the AKIS coordination bodies take to enhance AKIS and knowledge flows between AKIS actors? For instance in relation to ensuring knowledge flows, relational dynamics, common vision, integration of the advisors, ...

19. How will the potential of the education/capacity building be exploited to support the well-functioning of the AKIS?

20. How are AKIS relations governed within the countries/regions. Formal and informal

3. In relation to the Improvement of the integrated approach within the European AKIS and implementation of the EIP-Agri.

To achieve these, the study will focus on the mechanisms/incentives (delivery systems) in play to incentivize the participation of actors and the methods enhancing the knowledge flows among the AKIS' actors (e.g.: OGs). Also, the practices in use to assess/discover farmers' and advisors' needs will be investigated (e.g. role of advisors to collect the needs from practice).

The investigations will be developed around the following research questions:

21. Which mechanisms/incentives are in place in your RDP to incentivize/foster the active participation of the variety of AKIS actors in OGs or other cooperation (multi-actor) projects?

22. Indicate existing and future actions, and well working existing methods in your Country/Region leading to the strengthening of the knowledge exchange between AKIS actors, and to strengthen the connections between the research and the sector (farmers, cooperatives, industries, ...). Which role will the CAP network play in this regard?

23. Which practices are in use to assess the needs of farmers and of advisors?

24. Which AKIS actors are not fully oriented to fulfill farmers' needs?

1. Reasons why?

25. Which are the bottlenecks with regard to interactions between key actors and processes?

1. Which solutions are or will be put in place?

26. Which practices are in place at territorial level to help the synergies and complementarities among the different tools of the EIP-Agri, to boost innovations at farm level?

27. Which practices help the synergies and complementarities among the different available tools out of EIP-Agri at territorial level to boost and play innovations. Please indicate whether there are existing experiences to link research and practice in the following sectors:

1. Water, nutrients, plant protection

2. Energy

3. Digital

4. Agroecological

28. Based on the above question, please indicate type of experience for each sector:

1. Existence of Innovation support services

2. Existence of Innovation Hub/ pole competitiveness/ other type of clustering organization

3. Existence of competence centers

4. Existence of Demonstration centers

29. Based on the experience of the above-mentioned cross-cutting sectors. Which best practices do you consider of interest with potential to be implemented in the Agri-food sector? Please indicate three best practices (if possible provide a link to a publication or a web page)

4. In relation to the consideration of challenges and future changes in relation to EU R+I framework program Horizon Europe and the interlinkages with CAP policy.

The investigations will be developed around the following research questions:

30. How have H2020 Multi-actor projects strengthened the linkages between research and practice?

31. In particular, how is the AKIS, NRN or CAP network linking existing or future RD OGs with Horizon 2020 multi-actor projects. Which mechanisms work best?

32. How is the linkage between NRN's and NCPs and other H2020 multipliers organized in your country?

33. What are the different mechanisms which allow the participation of the end-users of project results in H2020? Which are the most effective in fostering the participation of a larger number of end-users?

34. What are the administrative burdens within H2020 that are seen as main barriers for strengthening the linkages between research and practice?

35. How have synergies between H2020 and national funding been developed in your country/region ? (e.g.: implementation of seal of excellence, linkages through NCPs, brokering events for H2020 topics, NRNs fostering OGs to connect with specific H2020 topics, etc).

36. What kind of incentives or funding mechanisms within EIP-Agri have allowed farmers/farmers associations/farmers cooperatives to start participating in innovation projects?

37. Which communication methods have allowed to raise the awareness of farmers/farmers associations/farmers cooperatives on the calls for participating in innovation projects?

- Brokering
- Using existing dissemination channels:
 - o Agricultural journals
 - o Radio
 - o TV
 - o Social media
 - o Others

38. Which organizations, besides Adv. Services, have developed a role of innovation support service in your country/region. Please identify organizations (type e.g.: consultancies, farmers associations or networks, cooperatives, applied research inst., agricultural schools, Research/academia...) with examples

Annex 2. List of experts

Countries	Expert name
HUNGARY	Timea Reszketo
POLAND	Ewa Grodzka
ROMANIA	Catalin Dragomir
SLOVAK REP.	Daniel Acs
BULGARIA	Dimitri Vanev
SLOVENIA	Anton Jagodic
THE NETHERLANDS	Floor Geerling-Eiff
BELGIUM	Sylvia Burssens
FRANCE	Jean-Marc Chourot
AUSTRIA	Michaela Schwaiger
IRELAND	Tom Kelly
ESTONIA	Helena Parenson
FINLAND	Sirpa Karjalainen
SWEDEN	Asa Wolgast
LITHUANIA	Rasa Palketinne
ITALY	Simona Cristiano
SPAIN	Andrés Montero Aparicio
	Visi García Ciudad
	Alberto Lafarga Arnal
CROATIA	Ivan Horvat
GREECE	Evi Arachoviti
PORTUGAL	Luis Mira

*Other experts also interviewed:

Jean Marc Chourot from Ministry of Agriculture and Food (France)

José Luis Catellanos, Jesús Nogués and Ramón Palacios from Aragon regional Gov. (Spain)

Rocío Wojski and Laura Enfedaque from Ministry of Agriculture, Fisheries and Food (Spain)