

# i2connect

INTERACTIVE INNOVATION



## Task 1.2

# AKIS inventory and the AS database

## Deliverable 1.2

# Update, web-based AKIS inventory (Report) – Volume I

January 2021

This report only reflects the views of the authors.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION' HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Dissemination Level

PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	x
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

## Summary

**Project number:** 863039

**Project title:** Connecting advisers to boost interactive innovation in agriculture and forestry

**Duration:** 5 years

**Start date of project:** 1/11/2019

**Coordinator:** APCA

**Project Coordinator:** Sylvain Sturel

**Project Manager:** Carmen Avellaner de Santos

**Communication Officer:** Rui Almeida

**Due data of deliverable:** 31<sup>st</sup> January, 2021

**Actual submission date:** 31<sup>st</sup> January, 2021

**Work package:** WP 1

**Task Leader:** Andrea Knierim

**Address:** andrea.knierim@uni-hohenheim.de

**Author(s):** Ed. Sangeun Bae, Fanos Birke, Andrea Knierim, Maria Gerster-Bentaya

**Version:** 31, Jan 2021

## Preface

At a whole, European Common Agricultural Policies (CAP) aim at supporting the green production sectors, namely agriculture, forestry and horticulture for which recently, a set of regulations has been proposed for the upcoming policy period from 2021 to 2027. The document lists nine specific objectives, which together contribute to the overall goal of sustainable development in farming, food systems and rural areas. One cross-cutting and prominent dimension in this regard is the fostering of knowledge, innovation and digitalisation in agriculture and rural areas. Here, advisory services play an important role, and Member States are called to strategically address the functioning of Agricultural Knowledge and Innovation Systems (AKIS) in order to provide the actors in the sector with the information and support services needed.

In 2014, a first inventory on agricultural knowledge and innovation systems (AKIS) and advisory services (AS) in the EU countries was set up in the context of the PRO AKIS project and systematic knowledge about AKIS infrastructures was compiled (proakis.eu). One recommendation from the project was that the AKIS country reports should be updated regularly as national and CAP policies continuously induce institutional and structural changes. It is within this context that the i2connect project consortium conceived a revision and update of the AKIS inventory. This time, the inventory has not only been updated for the existing AKIS descriptions for the EU member states but also includes four new countries, namely Croatia, Switzerland, Montenegro and Serbia. In addition, forestry advisory service providers were addressed in some countries, although not as comprehensively as the agricultural advisory service. In so doing, the AKIS acronym has thus been expanded to include the forestry sector so that the inventory addresses the needs of both agriculture and forestry advisory service providers.

The 27 country reports compiled in this inventory report give a comprehensive overview of the AKIS infrastructures and of the predominant agricultural and forestry advisory services on national and – if applicable – on regional levels. The intention is that through these reports, essential features of the institutional and infrastructural environment in which advisors in the green sector operate are revealed. This information will then serve as a basis for targeted interventions to support different types of cooperation between AKIS actors in solving problems.

Ultimately, the reports will provide up-to-date information for policy and practice in the respective countries.

Contextual differences among the European countries are inevitable, which makes every country report a unique document. Nevertheless, a common and highly unified approach was applied across the reports in order to allow comparative assessments and to create a cross-cutting baseline for future studies. This was achieved through a general structure that served as terms of reference for consortium partners compiling the country reports as well as a common online survey for advisory service providers that was conducted from October to December, 2020.

This inventory report consists of two volumes. Volume 1 contains the country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, Germany, Greece, Hungary and Ireland, Volume 2 contains reports from Italy, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, Poland, Portugal, Serbia, Slovakia, Slovenia, Spain, Sweden and Switzerland. Denmark is not included in these volumes as a recent update to the previous PRO AKIS report is already available.

Finally, this report is a work in progress and will be updated in the course of the project.

## National experts in Volume I

Austria	DI Florian Herzog, MSc, BEd. Dr. Eveline Neubauer
Belgium	Charlotte, Lybaert Lies, Debruyne
Bulgaria	Ivanka Todorova
Croatia	Kristijan Jelaković
Cyprus	Alex Koutsouris Eleni Zarokosta Vassiliki Kanaki
Estonia	Hanna Tamsalu
Finland	Jaana Kiljunen
Germany	Fanos Mekonnen Birke Sangeun Bae Annkatrin Schober Maria Gerster-Bentaya Andrea Knierim Pablo Asensio Margret Kolbeck Carola Ketelhodt
Greece	Alex Koutsouris Eleni Zarokosta Eleni Pappa Vassiliki Kanaki
Hungary	Gáborné Jakab Ágnes, Varga Zsuzsanna, Vér András
Ireland	Paul Maher

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# AKIS and advisory services in *Austria*

## Report for the AKIS inventory (Task 1.2) of the i2connect project

*Date: December, 2020*

**Authors:**

DI Florian Herzog, MSc, BEd.

Dr. Eveline Neubauer

Contact: email address of main authors

f.herzog@lk-oe.at

eveline.neubauer@haup.ac.at

Project funded under the Horizon 2020 Research and Innovation Programme  
under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION' HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

The Austrian Agricultural Knowledge and Innovation System (AKIS) is based on comprehensive vocational training, adult education, an extensive and high-quality range of advisory services and an agricultural research landscape. The AKIS is generally kept lean and the relatively few actors are well integrated. It relies mainly on public or, to a large extent, publicly funded and well-established organisations, private companies play a subordinate role. In the system, which has been established and proven over decades, responsibilities are clearly defined, overlaps or competition are rare, cooperation and knowledge flow within the AKIS are good and thus the use of funds is efficient. Furthermore, topics of public interest are embedded as cross-sectional matter in a broad agricultural and forestry education and counselling offer and are successfully transported into practice. A further essential cornerstone of the AKIS is the cooperation between research, education and counselling. The transfer between research and practice in Austria basically works well. However, there is a general need for further action with regard to alignment, structure, coordination and speed of exchange within the AKIS. There is still no institutionalised exchange of all actors.



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## Abbreviations

AGES: Agency for Health and Food Security GmbH  
AKIS: agricultural knowledge and innovation system  
AMA: Agricultural Market Austria  
ARGE: Working group  
BHK: Mountain farm register  
BMLRT: Federal Ministry of Agriculture, Regions and Tourism  
BOKU: University of Natural Resources and Applied Life Sciences  
CC: Cross compliance  
COVID-19: Coronavirus disease 2019  
CORE Organic - Coordination of European Transnational Research in Organic Food and Farming Systems  
DC: Direct payments  
ERA: European Research Area  
EC: European Community  
EIP: European Innovation Partnership  
EIP Agri: European Innovation Partnership "Agricultural Productivity and Sustainability"  
EP: Complicating factors  
ERA: European Research Area  
ERA-NET: Networking the European Research Area  
EU: European Union  
EUFRAS: European Forum for Rural Advisory Services  
FAS: Farm advisory system  
ForestValue: Innovative Forest-based Bioeconomy  
FOSC - Food Systems and Climate  
CAP: common agricultural policy  
GAEC: Good agricultural and environmental condition  
GFRAS: Global Forum of Rural Advisory Services  
HBLFA: Federal College of Higher Education and Research  
HORIZON 2020: Horizon 2020  
IALB: International Academy for Rural Consulting  
ICT-AGRI-FOOD: Information and Communication Technology (concerning the agri-food sector)  
ICRAD - International Coordination of Research on Infectious Animal Diseases

IT: Information Technology

JPI FACCE: Food Security, Agriculture and Climate Change in Europe

LE: Rural development

LFA: Agricultural and forestry apprenticeship and technical training centres

LFI: Rural Further Education Institute

LFZ: Teaching and research centre

LKÖ: Austrian Chamber of Agriculture

LK: Chamber of Agriculture

LQB: quality of life on farms

NGO: Non-governmental organisation

NTÖ: Association for Sustainable Animal Husbandry Austria

Ö-Cert: Quality framework for adult education in Austria

ÖKL: Austrian Board of Trustees for Agricultural Engineering and Rural Development

ÖPUL: The Austrian programme for the promotion of an environmentally sound, extensive and habitat-protecting agriculture

(ÖPUL) is the national implementation of the agri-environmental measures of rural development.

PFEIL: rural development programme

SCAR: Standing Committee for Agricultural Research

SusAn - Sustainable Animal Production

SusCrop - Sustainable Crop Production

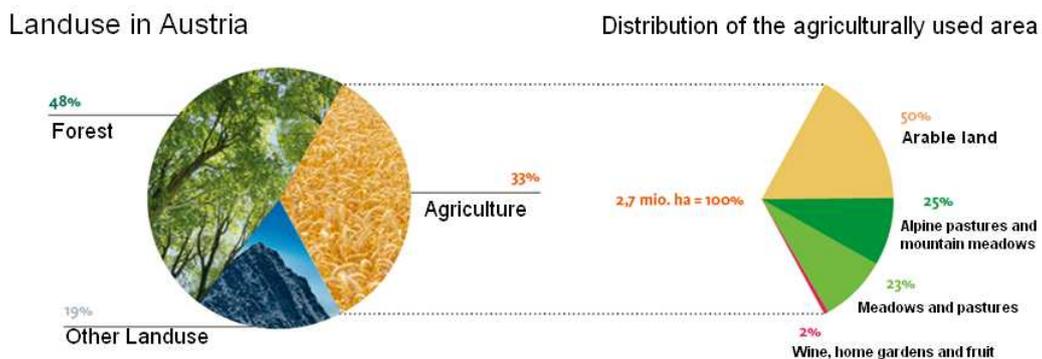
SVS: The social insurance of the self-employed

VO: Regulation

## 1. Main structural characteristics of the agricultural and forestry sector

### Structure

Austria has a small but highly developed agricultural sector. It is characterised by a small-scale structure, a large proportion of mountain areas and less-favoured areas. Agriculture plays an important role in Austria's historical and cultural tradition. It is still an indispensable economic factor and enjoys a high degree of public sympathy. The Austrian Government pursues a social-ecological agricultural policy and is committed to promoting its multifunctional role. In total, 81% of Austria (83,858 km<sup>2</sup>) are used for agricultural and forestry purposes, of which about 33% are classified as agricultural and 48% as forestry land.



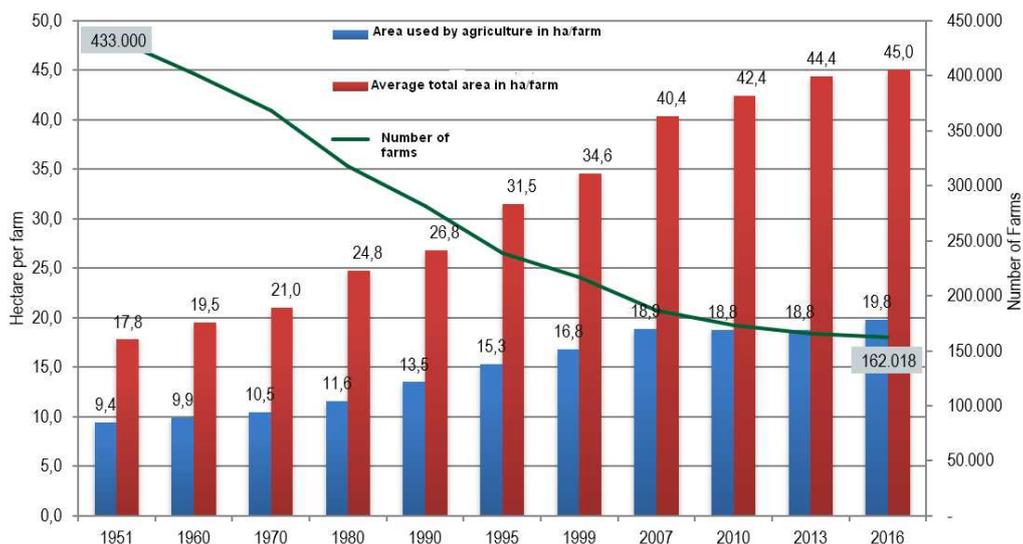
Source: LK Austria 2020

Figure 1 Area distribution in Austria and distribution of utilised agricultural area

According to the Agricultural Structure Survey 2016 (Statistics Austria 2018) this area was managed by 162,018 agricultural and forestry enterprises. These consist of 57,531 full-time farms, 89,782 part-time farms and 14,705 other farms (partnerships, legal entities). Compared to the last agricultural structure survey in 2016, the number of farms decreased by 4,299 or 2.6%.

Small and medium-sized enterprises predominate in Austria. Whereas 433,000 enterprises were surveyed in 1951, only 162,018 were counted in 2016. In contrast, the average total area per holding is continuously increasing. In 1951 it amounted to 17.8 ha, 9.4 ha of utilised agricultural area. In 2016 the average total area per holding was 45 ha, of which 19.8 ha were utilised agricultural area.

**Number of farms and average farmsize 1951 - 2016**



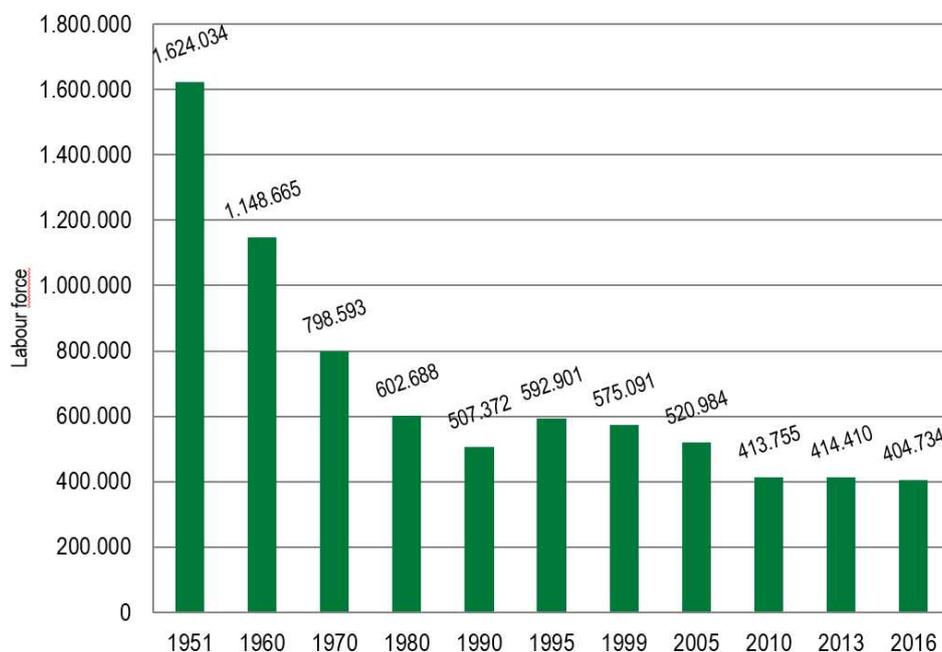
Source: Statistik Austria

*Figure 2 Number of farms and average farm size 1951-2016*

The majority of the farms, namely 137,841 or 85%, still cultivated less than 50 ha of agricultural and forestry land in 2016. For 15% (24,177 holdings), an area of 50 ha or more could be identified, whereas in 2010 only 8% (18,236 holdings) were counted in this category.

In the labour sector, the agricultural and forestry workforce is in continuous decline. A very strong decline can be observed from 1951 (1.6 million) to 1980 (602,688), but also from 2013 to 2016 the agricultural and forestry labour force decreased by 2.4%.

## Farmers and foresters in Austria



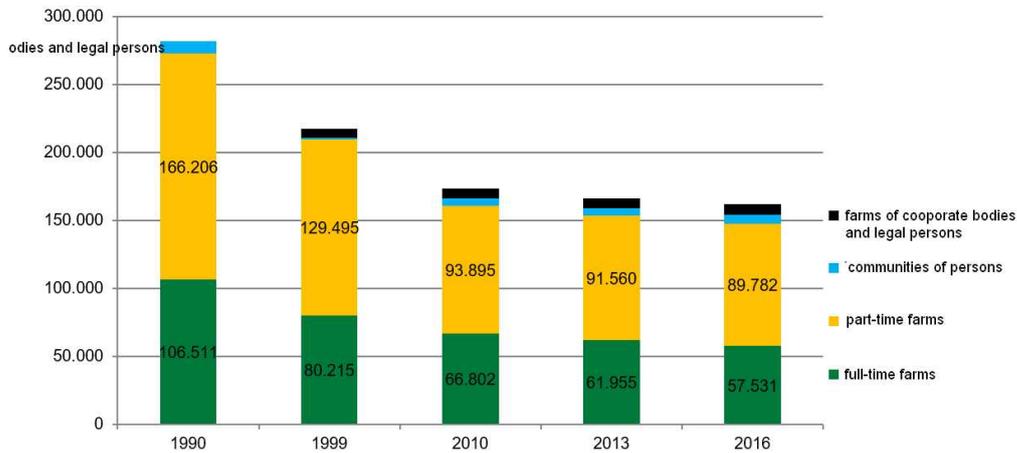
Source Statistics Austria

Figure 3Agricultural and forestry labour force in Austria 1951 to 2016

The agricultural and forestry holdings are mainly family farms (91%), 4% of the holdings were partnerships and 5% were holdings of legal persons. According to the Agricultural Structure Survey 2016, 57,531 holdings (36%) were managed as main occupation and 89,782 holdings (55%) as secondary occupation (Statistics Austria 2018).

Between 2013 and 2016, the number of farms being full-time businesses decreased by 4424 farms (-7.2%) and the number of secondary farms by 1778 farms (-2%). There was an increase in the number of partnerships as well as in the number of businesses run by legal entities.

### Development of full-time and part-time farms

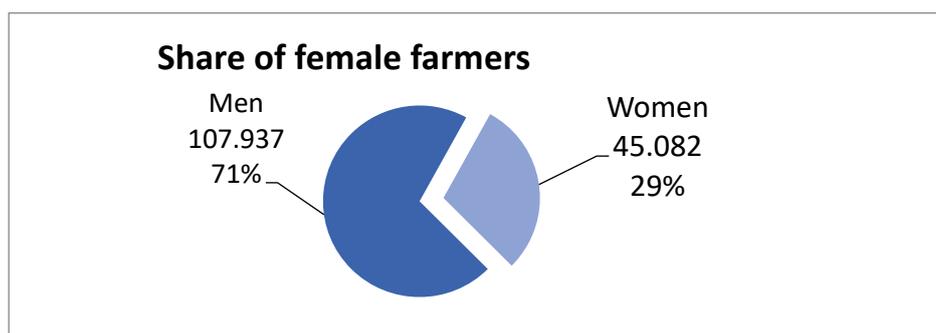


Source: Statistik Austria

Figure 4 Development of full-time and part-time farms 1990-2016

The vast majority, 333,178 persons or 82%, are family workers; of these, 239,519 persons (72%) stated that they were only employed on a case-by-case basis. Nearly half of the holders reported that 50% or more of their time was spent on the holding, while only 27,924 or 15% of the family workers had a main job on the agricultural and forestry holding (Agricultural Structure Survey 2016).

The management of agricultural and forestry enterprises is still a male domain; only 45,082 enterprises (29%) were managed by women in 2016.



Source: Statistics Austria

Figure 5 Share of female farmers 2016

The proportion of mountain and less-favoured areas in Austria is high compared to other EU Member States. According to the agricultural structure survey, mountain farms in Austria managed a total area of 2,186,448 ha in 2016. On

average, one mountain farmer had 37.2 ha, while a non-mountain farm had 49.5 ha of total area.

In a new evaluation by difficulty groups, 58,716 holdings (36%) were identified as mountain farms in EP groups 1 to 4 in the 2016 agricultural structure survey. In 2010 there were still 66,516 mountain farms (38%), 7,800 more than in 2016. However, it is pointed out that the difficulty point groups (EP groups) are only conditionally comparable with the previous BHK groups (Statistics Austria 2018).

### Economy and income situation

According to the Green Report 2020, the primary sector contributed around 1.3% to the gross value added of the economy in 2019. According to the preliminary results of the agricultural and forestry accounts, the production value of agriculture and forestry in 2019 was around 9.64 billion euros (-1.5%). Agriculture accounted for 7.48 billion euros and forestry for 2.16 billion euros. According to the preliminary results of the landscape accounts (as of July 2020), income from agricultural activity per worker fell by 5.6% in real terms in 2019, after a decline of 5.4% in 2018. The factor income generated by the agricultural sector as a whole fell by 5.0% in nominal terms and by 6.6% in real terms. The decline in agricultural labour input due to continued structural change was estimated at 1.0% in 2019. The main reasons for the drop in income were higher production costs and lower output values in fruit and wine growing, which were not offset by higher revenues in pig production.

### Development of agricultural incomes in Austria

Real factor income per worker, change compared to previous year in percent:



Figure 6 Development of agricultural income in Austria in 2019. Source: Statistic Austria

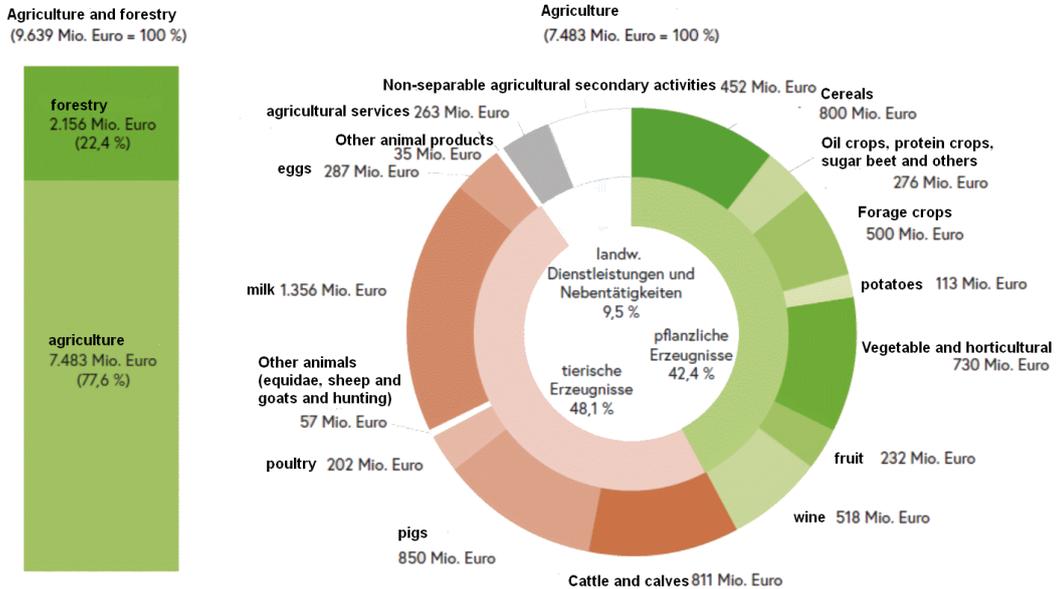
The main determinants of income development changed in 2019 as follows:

Production value at basic prices was around 7.48 billion euros (+1.6%). With the production volume remaining stable compared to 2018, producer prices increased by 1.6% on average.

The value of crop production in 2019 amounted to around 3.2 billion euros (+0.7%), representing 42% of the total production value. In the face of renewed drought, especially in the east of Austria, and above-average temperatures, the volume of crop production was slightly higher than in the previous year (+0.8%). Increased production volumes were recorded for cereals, oilseeds and oleaginous fruits, potatoes and vegetables. In contrast, output volume declined sharply, following the record harvest in fruit growing in the previous year. Wine and sugar beet production also declined. Producer prices for crop products remained stable on average (-0.1%), with lower prices for cereals and fruit and price increases for vegetables and root crops. The value of animal production increased by 2.6% to around 3.6 billion euros in 2019. Producer prices rose by 2.9 % on average, while the volume of production remained stable (-0.3 %). A strong increase in the output value of pigs (+17.8%) was offset by decreases in cattle (-3.9%), poultry (-1.2%) and milk (-1.0%). Livestock production accounted for 48% of total agricultural output value in 2019. In the pig market, the spread of African swine fever in Asia and the resulting high import demand from China drove up prices. Cattle stocks have been reduced in the last two years due to drought-related feed shortages. The number of slaughterings also declined. In the case of milk, production volumes fell slightly for the first time (-0.8%) following increases in production over the last five years. For poultry, the main reasons for the fall in production value were lower producer prices for chickens for fattening and lower production volume for turkeys.

About 10% of the agricultural production value was accounted for by agricultural services and secondary activities. In total, this sector constitutes around € 0.8 billion (Green Report 20).

**Composition of agricultural production in 2019**



Source Statistics Austria Forestry Accounts, compiled 09.07.2018

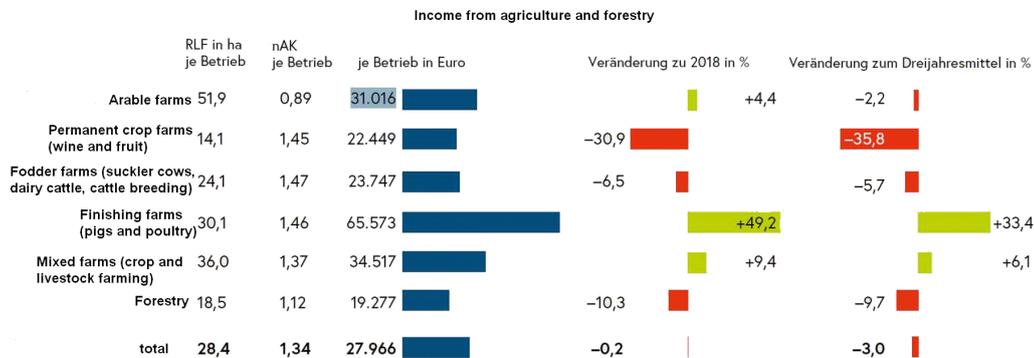
Figure 7 Composition of agricultural production in 2019

According to the Green Report (2020), income from agriculture and forestry for 2019 averaged 27,966 euros per farm for all farms. After the income increases of the previous years (2016, 2017), 2018 saw a turnaround, in 2019 the income remained constant compared to the previous year.

In 2019, the income amounted to 121,787 euros per farm. They consisted of income from land use (19%), animal husbandry (40%) and forestry (5%). Public funding contributed 16% of the yield with 19,679 euros (BMLRT 20).

The following figure shows the results by type of operation in 2019 at the level of the 6 types of operation.

Selected results by type of farms 2019



Quelle: BMLRT, LBG Österreich, BAB

Figure 8 Selected results by type of operation 2019

Around 26 % of the agricultural area is managed by around 22 % of the farms, according to the principles of organic farming (BMLRT 2020).

## Forestry

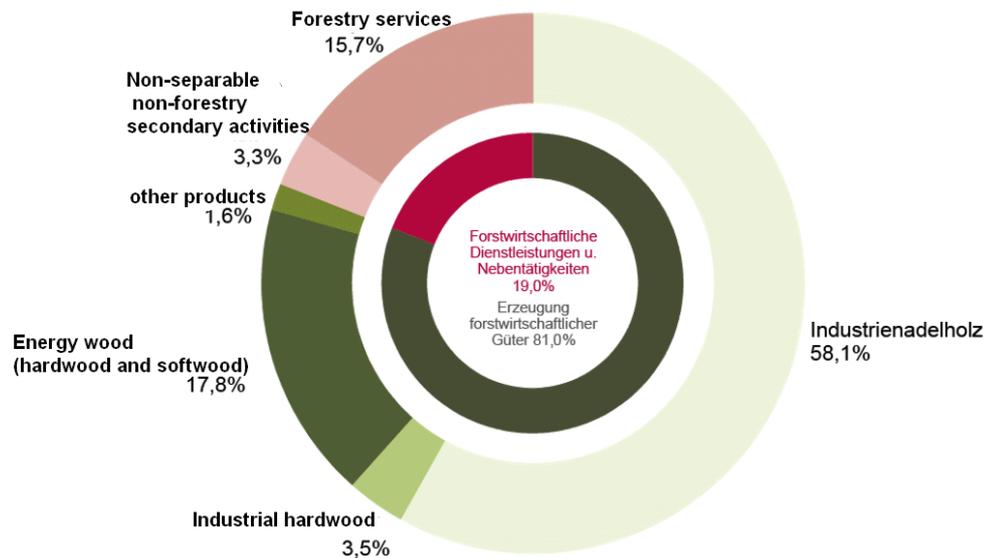
In 2015, 3.99 million hectares of forest were under cultivation, which is 47.6% of the national territory. 80% of this is privately managed. A total of 142,800 farms have a forest share.

More forest grows back than wood is taken from the forest. In the last 10 years, the proportion of forest has grown by an average of 3,400 hectares per year. Currently, around 88% of the renewable wood is used (Forest Inventory 2019).

The local forestry and timber industry is an important economic factor. 172,000 businesses and companies along the value chain forest-wood-paper secure jobs for about 300,000 people in Austria.

The production value of the forest along the entire value chain in 2017 was 12 billion euros. This consisted of 58.1% industrial coniferous wood, 17.8% energy wood, 15.7% forestry services, 3.3% "inseparable non-forest services" and 1.6% other products. The average export surplus is 3.5 bn euros per year.

## Forestry production in 2017



Q: STATISTIK AUSTRIA, Forestry accounts, prepared on 09.07.2018

Figure 9 Production value of forestry in 2017

### Austria's agriculture and forestry are facing numerous challenges:

- Preparation of the national CAP strategic plan for the period 2023 to 2027 with consideration of the EU requirements (Green Deal, Farm to Fork and Biodiversity Strategy)
- Convey the requirements and conditions of the CAP 2023 to 2027 and implement them together with farmers through educational and advisory activities.
- Implementation of measures for climate protection and adaptation to climate change
- Development of optimised processes for better energy efficiency
- Reduction of the use of pesticides, fertilisers and antibiotics
- Measures to improve animal welfare
- Improving the position of agricultural and forestry enterprises in the value chain
- Measures to ensure short supply chains
- Increasing the value of regional food
- Improving competitiveness

- Improving food quality
- Promotion of digitisation in agriculture and forestry
- Development of additional offers for digital further education and extension (webinars, farminars, online extension) with the corresponding prerequisites (technical equipment and training of extension staff and farmers) risk management or crisis prevention (e.g. power failure in electronically controlled stables, Covid-19)
- Reducing emissions and thus the greenhouse effect

## 2. Characteristics of AKIS

### AKIS diagram Austria

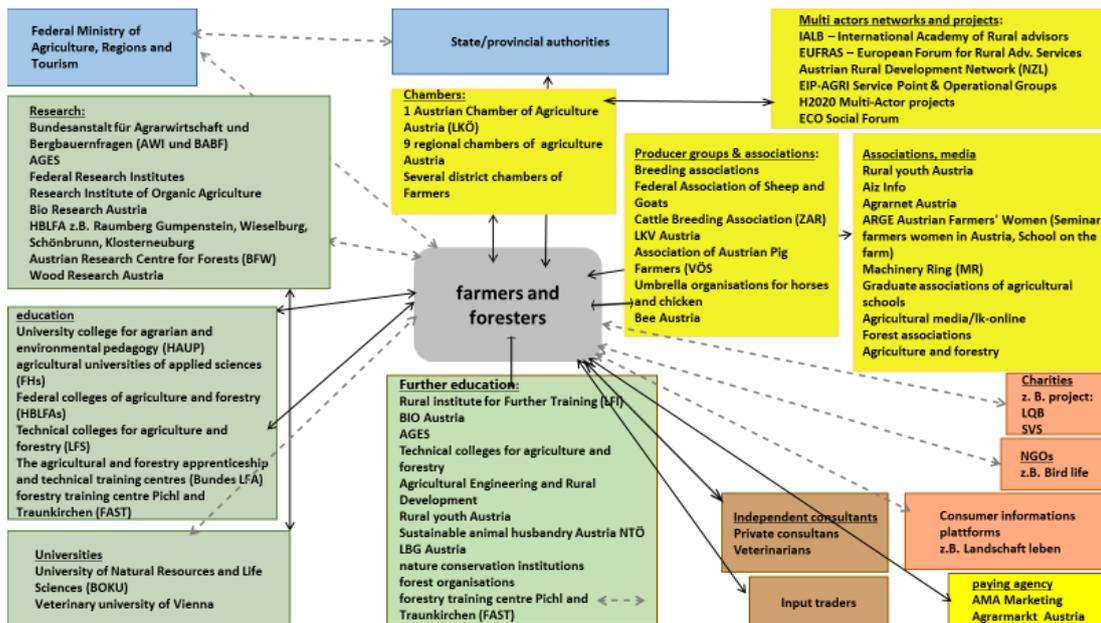


Figure 10 AKIS actors

#### Legend:

- Public authorities
- Research and education organisations
- Private sector (for profit)
- Third sector farmer/farmer-based organisations
- Third sector NGO (non-profit)
- Strong Linkage\*
- - - Weak linkage

### 2.1. AKIS description

A comprehensive and well-functioning agricultural education, training and advisory system covering the whole country is considered very important for the development of agriculture, forestry and rural areas in Austria. Furthermore, there is a broad consensus on the importance of research, cooperation and know-how transfer via education and extension as drivers of innovation. The Austrian Agricultural Knowledge and Innovation System (AKIS) is therefore based on a

comprehensive VET b) adult education c) a nationwide and high-quality range of guidance services and d) an agricultural research landscape. An essential cornerstone of AKIS is the cooperation between research, education and extension.

Since agriculture and the viability of rural areas are public interests, public bodies, the Federal Ministry of Agriculture and Forestry, Environment and Water Management (BMLRT) (with its teaching and research institutes), the federal offices and the provincial governments of the nine provinces, the 10 Chambers of Agriculture with their 73 district chambers (as of April 2019), various research institutes, schools, associations and some NGOs are part of the AKIS.

Only a few organisations are in direct contact with farmers, first and foremost the chambers of agriculture, but also veterinarians, organic farming associations, a few farmers' associations and non-profit organisations. Cooperatives, private consultants and the agro-industry play only a minor role in advising farmers. Only in special areas (e.g. horticulture, vegetable and fruit growing, herd management, marketing, tax issues) private consultancy firms do play a greater role in isolated cases.

Responsibilities are generally clearly defined and divided between the organisations at federal and state level. Cooperation between the actors and the flow of information within the AKIS is good, overlapping of responsibilities and competition are rare. The permeability from research to practice and vice versa basically works well, even if the transfer of information is slow and there is no regular, institutionalised exchange of information between all actors.

## **2.2. AKIS actors and knowledge flows**

The structure of the Austrian AKIS is lean, clear and rather small compared to other EU Member States. It has developed continuously over time and has not undergone any major restructuring or commercialisation/privatisation compared to other EU Member States.

While the Austrian AKIS is characterised by a very close link between VET, adult education (continuing and further education) and guidance, the link to public research institutions is sometimes less strong. However, there are good connections to the Higher Federal Teaching and Research Institutes (HBLFAs), which are departments of the Federal Ministry of Agriculture, Regions and

Tourism (BMLRT). The HBLFAS (e.g. Raumberg Gumpenstein, Klosterneuburg, Wieselburg and Schönbrunn) combine school education, (graduation with a specialist Matura), CET (mainly for guidance and teaching staff) and research under one roof. They are centres of competence and have developed into outstanding institutions with specialisations in selected areas.

As stated in the AKIS Report 2013, the transfer between research and practice in Austria basically works well. However, there is further need for action with regard to alignment, structure, coordination and speed of exchange. The Chamber of Agriculture has taken on responsibility in this respect, takes on the role of a "bridge between research and practice" and, among other things, through participation in various multi-actor and AKIS-relevant projects or the LKÖ Committee for Education and Counselling, implements targeted activities in the area of AKIS coordination to stimulate the exchange between actors in research, education and counselling. There are further activities in this area by actors such as the Austrian Board of Trustees for Agricultural Technology and Rural Development (ÖKL), the Ecosocial Forum, the national network for rural development (Netzwerk Zukunftsraum Land), the platform for agricultural and environmental education of the Platform for Digitisation in Agriculture coordinated by the BMLRT and the Platform for the Implementation of Innovation Strategies.

In the following, the most important actors and their role in AKIS are described:

### **Central actors in coordination and administration**

#### **Federal Ministry of Agriculture, Regions and Tourism (BMLRT)**

It has a wide range of responsibilities and is responsible for agriculture, forestry and water management as well as telecommunications and postal services, mining, regional policy, tourism and community service.

In the AKIS, which is heavily dependent on public funds, the BMLRT plays an important role as a funding agency: For example, it defines the strategic orientation and monitors the education and counselling services it supports. Research is carried out by departments (federal offices, teaching and research institutes) or by external research institutions in the form of research contracts. The basic structure for the National Centres of Competence in Research is the Research and Development Programme, which runs from 2020 to 2025. The

following is a list of relevant departments which are entrusted with numerous tasks of teaching, research and participation in continuing education. Only in very few cases and on specific topics do they provide direct advice to farmers: College of Agricultural and Environmental Education, Federal College of Agriculture Raumberg-Gumpenstein, Federal College of Agriculture, Agricultural Engineering and Food Technology and Food Technology Francisco-Josephinum, Federal College of Agriculture and Food, Food and Biotechnology Tyrol, Federal College of Agriculture and Food Economy Sitzenberg, Federal College of Agriculture Origin, Traunkirchen Forestry College, Federal College and Federal Office for Viticulture and Fruit Growing Klosterneuburg, Federal College of Horticulture Schönbrunn and Austrian Federal Gardens, Federal College of Agriculture and Food Elmsberg, Federal College of Agriculture and Food Pitzelstätten, Federal College of Agriculture St. Florian, Federal College of Forestry Bruck an der Mur, Federal Water Management Office, Federal Institute of Agriculture and Mining Vienna, Federal Office for Viticulture Eisenstadt, Federal Winery Inspectorate Vienna.

The Federal Ministry of Agriculture, Forestry, Environment and Water Management supports the counselling and educational institutions by publishing counselling documents and aids as well as by a nationwide further training programme for counselling and teaching staff in cooperation with the College of Agricultural and Environmental Education and other departments of the Federal Ministry of Agriculture, Forestry, Environment and Water Management such as the HBLFAs.

In addition, the Federal Ministry of Agriculture, Forestry, Environment and Water Management supports the work of several other organisations, e.g. the Austrian Board of Trustees for Agricultural Engineering and Rural Development (ÖKL), various other associations and producer organisations, the machinery rings, Compost and Biogas Association Austria and environmental organisations.

<https://www.bmlrt.gv.at/ministerium.html>

### **Chambers of Agriculture (LK)**

The Chambers of Agriculture are the statutory representation of the interests of Austrian farmers and bodies under public law established by provincial law. They are semi-publicly financed as they are (mainly) financially supported by the provinces and the federal government, but also receive compulsory membership fees (“Kammerumlage”) from farmers. The Chambers of Agriculture are divided into the 9 Regional Chambers of Agriculture with over 70 regional district

chambers or branch offices, in which a total of around 1,700 full-time employees work. The Austrian Chamber of Agriculture is the umbrella organisation of the nine Chambers of Agriculture at federal level.

is set up.

The four main tasks of the LK are

- Representing the interests of its members (all farmers and foresters in Austria)
- Involvement in funding administration (e.g. funding management for the state and federal government)
- Advice for members: The mandatory mandate to advise all agricultural and forestry enterprises is laid down in state laws. Thus, the LK assumes the role of the official advisor of Austria.
- Initial and continuing training for members: Continuing training is provided by the educational organisation of the LK, the Rural Training Institute (LFI, see below). Vocational training is provided by the Apprenticeship and Skilled Worker's Office (LFA, see below) affiliated to the Regional LK.

This will enable a "one-stop-shop" principle in the areas of advice, promotion and training for agricultural and forestry enterprises. The LK is also home to many other trade associations. Bringing them together under the umbrella of the LK enables close coordination and a well-functioning flow of knowledge between the central elements of counselling, initial and continuing vocational education and training which are central to the AKIS. In addition, the LK is carrying out targeted activities in the area of AKIS coordination to stimulate the exchange between actors in research, education and guidance, and is thus fulfilling its role as a "bridge between research and practice" and backbone of the Austrian AKIS.

A more detailed description of the LC as the central counselling organisation in AKIS and the links to other actors is given in Chapter 4.

<https://www.lko.at>

### **Central actors in education (initial and continuing education and training)**

The increasing differentiation and globalisation of important areas of life as well as the dynamics in the economy and society make the continuous development of knowledge, skills and competences the most important prerequisite for the individual to be able to develop self-determination and realise individual life plans. Educational institutions must create the appropriate framework conditions for

this in order to strengthen motivation for education and increase participation in continuing education.

Lifelong learning is becoming increasingly important in the face of rapid change. Initial training continues to provide the necessary basis in the life of the working population, but permanent higher qualifications and ongoing education are absolutely essential in our knowledge and service society in terms of being able to adequately meet the rapid changes in social structure, economy and technology in the sense of lifelong learning.

Within formal education, the **tertiary education system** with the University of Natural Resources and Applied Life Sciences Vienna (BOKU), the University of Applied Sciences for Agricultural and Environmental Education (HAUP) and Universities of Applied Sciences with agricultural study programmes (e.g. FH Wr. Neustadt, FH Upper Austria and FH Joanneum) as well as the University of Veterinary Medicine play a key role.

#### **College for Agricultural and Environmental Pedagogy (HAUP)**

The University of Applied Sciences for Agricultural and Environmental Education Vienna is a tertiary institution for initial and continuing education and the pedagogical centre for initial and continuing education of teachers and advisors in agricultural, forestry and environmental pedagogical professions.

Full-time or part-time studies lasting several semesters are offered in the field of agricultural and environmental education in cooperation with the University of Natural Resources and Applied Life Sciences. In continuing education and training, shorter courses can be attended as well as university and master's courses. There is also a wide range of courses from counselling, educational management and leadership in agricultural schools to courses on the subject of "fruit and vegetables" as well as business management and green care.

The university currently has 780 students in higher and continuing education, and the number is rising. In addition, the university runs around 150 nationwide continuing education seminars for counselling and teaching staff with around 4,500 participants per year. The continuing education programme is coordinated together with those responsible for counselling and continuing education. Numerous continuing education events are carried out in cooperation with the teaching and research institutes of the BMLRT in order to quickly pass on the

results and findings of research projects to multipliers. In addition to the initial and continuing training of agricultural teachers and extension staff and thus the building of bridges between schools and extension services, HAUP also plays an important role in research - especially on AKIS-relevant topics and methodological development of the education and extension services.

<https://www.haup.ac.at>

### **University of Natural Resources and Applied Life Sciences (BOKU)**

As the university of life, BOKU combines scientific, technical and socio-economic topics and offers various studies in the field of agriculture and forestry. BOKU is one of the best sustainability universities in Europe and a place where science and students exchange ideas with society, business and politics. BOKU supports the goal of integrating sustainability into all processes of society. BOKU's activities in research and teaching are primarily based in Austria, although international research and cooperation projects such as English-language or international Master's programmes are also pursued in cooperation with other countries (e.g. Sweden, New Zealand, Czech Republic, France, etc.). In 2019, 2,829 people were employed, including 2,090 academic staff and 10,941 enrolled students (Boku 2020).

[www.boku.ac.at](http://www.boku.ac.at)

Furthermore, the well-developed **agricultural school system** is an important basis for sound and professional training in agricultural and forestry production and in the promotion of environmental and entrepreneurial skills. There is a large intake of students, and the training is practical and career-oriented. There is a wide range of offers for different subject areas and for all age groups from the 9th school year (14 years) upwards:

### **Secondary agricultural and forestry schools (HBLFA)**

The 11 secondary agricultural and forestry schools of the BMLRT (HBLA u BA Klosterneuburg, HBLFA Raumberg-Gumpenstein, HBLFA for Horticulture Schönbrunn and Austrian Federal Gardens, HBLFA Francisco Josephinum Wieselburg, HBLFA Tyrol, HBLA Bruck/Mur, HBLA Elmberg, HBLA Pitzelstätten, HBLA Sitzenberg, HBLA St. Florian and HBLA Ursprung) as well as the "Höhere Lehranstalt für Landwirtschaft des Bäuerlichen Schul- und Bildungszentrums BSBZ Hohenems" and the "Private Höhere Lehranstalt für Landwirtschaft und Ernährung des Schulvereins der Grazer Schulschwester in Graz-Eggenberg"

counted a total of 3,873 pupils in the 2019/20 school year. Training at the secondary agricultural and forestry schools lasts five years (15-19), the advanced courses (after completion of a technical school) last three years. Both forms of training conclude with the “Reife- and Diplomprüfung”, the general qualification for university entrance (Green Report 2020).

### **Agricultural and forestry colleges (LFS)**

In the 2019/20 school year there were 77 agricultural and forestry vocational and technical schools with 12,159 pupils. The qualification at an agricultural and forestry VET college leads to the qualification of skilled worker. Other ways to obtain a skilled worker's qualification include evening school or the so-called "Farmers' School". Graduates of technical colleges can also take part in a postgraduate course at a higher agricultural and forestry college.

The LFS are provincial schools, the Federal Government (BMLRT) also provides support here by subsidising the teachers' personnel costs, providing documentation and aids and a comprehensive further training programme for teachers, which is handled by the HAUP. Only in the forestry sector is there also a federal technical college. It is in Traunkirchen and registered 72 pupils in the 2019/20 school year. The technical colleges for agriculture and forestry (some with training companies and experimental areas) also contribute to knowledge transfer.

**Vocational training in agriculture and forestry** is organised by the apprenticeship and technical training centres:

### **Agricultural and forestry apprenticeship and technical training centres (LFA)**

The LFAs are responsible for vocational training in agriculture and forestry in Austria. As a hub for vocational qualification, they support people interested in training as well as training and apprenticeship companies. As authorities they are responsible for holding examinations.

Depending on the federal state, training is offered in the 15 agricultural occupations - from apprenticeship or skilled worker level in the second educational path to master craftsman level in cooperation with the chambers of agriculture and schools. The offer is aimed at young people, as well as adults, i.e. apprentices, future farm take-overs, career changers and employees. As a minimum qualification, the skilled worker qualification is a prerequisite for the start-up aid for young farmers (LE 14-20). Proof of a master craftsman's certificate

is required to qualify for the start-up aid. The part-time skilled worker qualification in the second educational pathway plays an important role for part-time farms and lateral entrants to agriculture. More than half of the skilled worker qualifications are obtained in this way. Also important for needs-oriented vocational qualification are master craftsman courses, which are organised federal state-crossing / trans- provincial / on a national level by the Federal LFA and supported by rural development funds.

<https://www.lehrlingsstelle.at>

The area of **non-formal education (CET)** is largely covered by the Rural Continuing Education Institute (LFI) as the educational institution of the Chambers of Agriculture and various professional and interest associations. In addition to the LFIs, CET for forest owners is very largely provided by the Federal Forest Training Institutes (FAST) and FAST Pichl (part of the LFI Styria).

#### **The Rural Training Institute LFI**

The LFI is the educational enterprise of the Chambers of Agriculture and is represented in each federal state by a state organisation. The educational offer for farmers strengthens professional and personal success. In addition to traditional and technical training, courses are also offered in the areas of personal development, health and environmental protection. Furthermore, there are also offers in the fields of business management, EDP, income combination, direct marketing and farm holidays. The ten LFIs (LFI Austria and LFI in the provinces) are the largest among the currently 26 training providers recognised by the BMLRT for measure 1 (LE 14-20).

In 2019, the LFI organised a total of 11,398 educational events with 264,684 participants. The demand for LFI services remains high despite the declining number of agricultural enterprises. In addition to seminars in presence, there are also innovative online offers in the form of online courses, webinars and farm seminars (online events live from the farm, field, barn or forest).

Short courses of a few hours up to certificate courses lasting several months are offered.

<https://www.lfi.at>

**Various professional and interest associations:** Further training and, in part, counselling measures are also provided by professional and interest associations. These are often integrated into the Chambers of Agriculture, such as the

Almwirtschaftsverband, ARGE Bäuerinnen, ARGE Meister, etc. Some of them are also recognised and thus independent training providers in the M1 measure of the Rural Development Programme (LE 14-20, currently 26 recognised organisations), which offer subsidised CET measures for farmers (mostly in the form of cross-provincial projects). The most important of these are, for example, Bio Austria, Rural Youth, the Association for Sustainable Animal Husbandry Austria (NTÖ), the Austrian Board of Trustees for Agricultural Engineering and Rural Development (ÖKL), the forestry training centres and other institutions of adult vocational training.

### **Bio Austria**

Bio Austria is an association of Austrian organic farmers and thus the representation of organic farming in Austria and is organised as an association. 12,500 Austrian organic farmers are members. The organic farms are supported in the marketing of their products and in the areas of organic farming. Bio Austria ensures the safeguarding of the Bio Austria quality standards, offers consulting and further training opportunities and an organised exchange of experience for members. Organic farmers are supported in the production of organic food and in successful farming.

At the federal level, the consulting services of Bio Austria are financially supported from national and LE funds (M2). As a recognised education provider in M1, Bio Austria organises many nationwide CET events. The Bio Institute at the HBLFA Raumberg-Gumpenstein supports the advisory and educational work for organic farms through research projects.

<https://www.bio-austria.at>

### **Rural youth (LJ)**

With more than 90,000 members, Rural Youth Austria is the largest youth organisation in rural areas. It is the motor for active, responsible and critical participation. The Rural Youth is committed to rural concerns and to a successful future of farm successors. It also stands for sustainable farming and active environmental protection and is very committed to promoting understanding between the population groups in rural areas. For the personal development of young people, the Rural Youth offers a comprehensive educational programme and contributes to various Austrian committees to address the concerns and needs of young people from rural areas.

[www.landjugend.at](http://www.landjugend.at)

### **Agency for Health and Food Safety GmbH (AGES)**

AGES is an undertaking of the Republic of Austria. Owner representatives are the Federal Ministry of Social Affairs, Health, Care and Consumer Protection and the Federal Ministry of Agriculture, Regions and Tourism. The AGES has been in existence since the first of June 2002.

The AGES supports the management of the Federal Ministries in questions of public health, animal health, food safety, drug safety, food security and consumer protection along the food chain professionally and independently with scientific expertise (tasks according to § 8 Health and Food Safety Act - GESG).

The AGES Academy, which was founded for further training activities and is a recognised training provider in M1 (LE 14-20), also offers further training events for multipliers and farmers in addition to its research activities (e.g. soil protection, water protection, nutrient management, plant protection, variety recommendations).

<https://www.ages.at/startseite/>

### **Central actors in counselling**

In agricultural and forestry extension services the **Chambers of Agriculture** are the central provider in Austria. In addition, advisory services are also partly provided by **professional associations**. In the field of organic consultancy, the Chambers of Agriculture work together with **BIO Austria**, the largest Austrian organic association, under the umbrella of ARGE Bioberatung.

Private counselling providers are represented regionally in special and niche topics but play a subordinate role in the AKIS as a whole.

The forestry advisory services provided by the Chambers of Agriculture are complemented by offers from the state forestry services, smaller private engineering firms and forestry service organisations as well as the **forest associations** (depending on the federal state).

### **Key players in research & innovation**

Research and innovation is mainly carried out in public, semi-public and private institutions. The University of Natural Resources and Applied Life Sciences, Vienna, and the departments and federal teaching and research institutes (HBLFAs) of the Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLRT) play an important role here.

The activities are mostly programme and tender oriented and organised in clusters, projects or networks of research and consultancy organisations. Therefore, some interaction with research and innovation in the private sector is given. Applied research with a high practical relevance is additionally carried out through experimental activities of the chambers of agriculture, organic farming associations and technical colleges. The results are thus quickly incorporated into counselling, continuing education and teaching.

**Extract from important agricultural research institutes:**

- University of Natural Resources and Applied Life Sciences (BOKU) [www.boku.ac.at](http://www.boku.ac.at) (see description under education)
- University of Veterinary Medicine Vienna [www.vetmeduni.ac.at](http://www.vetmeduni.ac.at)
- Research Institute of Organic Agriculture Fibl <https://www.fibl.org>
- Wood Research Austria <https://www.holzforschung.at>
- Bio Research Austria <https://www.bioforschung.at>
- Agency for Health and Food Security (AGES) <https://www.ages.at>
- Departments of the BMLRT:
  - o Federal Forest Research Centre (BFW) <https://www.bfw.gv.at>
  - o Federal Institute for Agriculture and Mining <https://bab.gv.at>
  - o HBLFA Raumberg-Gumpenstein <https://raumberg-gumpenstein.at/forschung.html>
  - o Federal Office for Viticulture and Fruit Growing <http://www.weinobstklosterneuburg.at>
  - o HBLFA for Horticulture Schönbrunn <https://www.gartenbau.at>
  - o HBLFA for Agriculture, Agricultural Engineering and Food Technology Francisco Josephinum Wieselburg <https://www.josephinum.at>

*A list of further AKIS actors with web links can be found in the annex.*

### 2.3. Policy framework at national level

In terms of legislation, agriculture and forestry is basically the responsibility of the 9 federal states. The 9 federal states each have their own secretaries and subordinate authorities responsible for agriculture and forestry. At the federal level in Austria, the BMLRT is responsible for providing the agricultural sector with a framework and guidelines, e.g. by setting guidelines and positive incentives through support programmes. Several national and European policies set the framework and guide the overall direction of the Austrian agricultural sector and rural development.

However, there is no consistent AKIS policy even though, in terms of agricultural research, education and extension, Austria follows the European and national agricultural policy priorities and focuses both on modernisation and multifunctionality.

In Austria there are several public support schemes with relevance for the AKIS, namely in the fields of agriculture, education & counselling, research & innovation.

The following policies and programmes or instruments are particularly worth mentioning in connection with AKIS:

#### **Common agricultural policy (CAP)**

The reformed CAP 2020 entered into force on the first of January 2015. This reform of the CAP has made direct payments (DC) more targeted towards certain measures, in particular climate and environmental protection, areas and beneficiaries.

Work is currently underway on the new CAP, which will apply until 2027: The new content of the EU's Common Agricultural Policy is expected to come into force from **2023**. The CAP 2020+ requires for financial support the presentation of a national CAP Strategic Plan describing how the nine specific objectives and the horizontal objective "Knowledge, innovation and digitalisation in agriculture and rural areas" will be implemented. Among other things, it must also describe how AKIS is to develop through the planned support measures.

#### **National Programme for Rural Development 2014 - 2020 (LE 14-20)**

All rural development measures (EAFRD fund) in Austria are combined in a national programme for rural development. Even though both the content and the legal framework are constantly evolving over time, the priorities of Austrian agricultural policy in rural development have remained constant over the years. At the centre of this policy are resource, environmental and climate protection, which are primarily addressed by the Agri-environmental Programme ÖPUL, the Austrian Programme for the Promotion of Environmentally Sound, Extensive and Habitat-Protecting Agriculture. The central objectives are to ensure the management of disadvantaged areas and to maintain and further develop the Austrian cultural landscape - not only, but also essentially in the Alpine region. For agriculture, investments in farms and in processing represent further essential measures in rural development.

With regard to the **further development of the AKIS, EAFRD support** under the Austrian Rural Development Programme plays a major role. In concrete terms, support and positive pooling of resources is provided, for example, by measure 1 (knowledge transfer and information measures), measure 2 (counselling) and measure 16 (cooperation).

The development and implementation of advisory and training services are promoted via the **education and extension services** (M1 and M2) and thus made more accessible to farmers and foresters. It also facilitates coordination and cooperation between different actors and the setting of thematic priorities.

The education and advisory system should offer tailor-made solutions and strategies for individual farms in order to strengthen the competitiveness of farms and to create an attractive and vital rural area. The BMRLT has therefore defined several themes which are intended to contribute to the strategic objectives in the agriculture and forestry sector (strategic farm development, professional business management, use of digital technologies for management, farm management, documentation, advice and training, energy efficiency, renewable raw materials, area-wide agricultural production and sustainable management of natural resources).

The BMLRT is responsible, among other things, for the strategic orientation, management and control of the education and advisory services it subsidises. In addition, it coordinates the actors, sets targets and ensures a coordinated approach to the development and implementation of activities. This is intended to pool resources and avoid duplication.

Since 2017 the Chambers of Agriculture and Bio Austria have been working together in a consortium as a joint applicant for funding for organic extension services (see Chapter 4 for more information on the funding of extension services). To improve the vocational qualification of farmers, the LE 14-20 **Measure 1** programme supports **continuing vocational training**. annually, 16 million euros are available for nationwide projects and for training measures in the federal states under Measure 1 (Knowledge transfer and information). Through a selection procedure, 26 training providers were identified who are eligible to apply for funding for M1 training projects. An important support function is provided by the cross-provincial projects, for which around 40% of the M1 funds are available. They provide significant support for the needs assessment, development, application and coordination of nationwide education initiatives, including documents for lecturers and participants.

The cooperation of actors across federal states contributes to the high quality of the services on offer, and also enables synergy effects to be exploited. In special areas, federal projects also provide further training for farmers and foresters. Successful examples of this are, amongst other things, working group advice and nationwide certificate courses.

However, also in the federal provinces, such as Upper Austria with the Upper Austrian Education Account, continuing education measures are supported for farmers to improve their professional development and personal qualifications.

In addition to the quality management systems of the providers, which are obligatory as funding conditions, evaluation and demand studies are carried out on an ongoing basis in cooperation with the University of Agricultural and Environmental Education and other scientific institutions to **evaluate and, if necessary, reorient or improve the education and counselling provision**. The results are intended to contribute to a professionalisation of extension and continuing education in various production sectors in line with customer needs. Examples of completed or ongoing studies with high AKIS relevance:

- Agricultural and forestry diversification in Austria: concept, economic relevance, success factors and approaches for further education and counselling ([Link to the study](#))
- AgriTrain - Train the Trainer for a Sustainable Agriculture ([Link to the study](#))
- Evaluation project Economic Efficiency of Diversification in Austria - University of Applied Sciences for Agricultural and Environmental Education ([Link to the study](#))

- Professionalisation of further education and counselling in Austrian cattle and pig farming - University of Applied Sciences for Agricultural and Environmental Pedagogy ([Link to the study](#))
- Factors and strategies for an economic milk production - Statistical analysis of the full cost evaluation within the framework of the nationwide working group consultation in Austria - University of Applied Sciences for Agricultural and Environmental Pedagogy ([Link to the study](#))

The promotion of **cooperation (measure 16)** was also successfully used in the current funding period to better network different AKIS actors with each other and to bundle resources:

In projects supported by **cluster funding**, actors from research, practice, consulting, education and business were brought together to achieve common goals, such as advancing the digitisation of the sector in the cluster "Digitisation in Agriculture" or increased communication with society in the "Education Cluster". The European **Innovation Partnership** "Agricultural Productivity and Sustainability" (**EIP-Agri**) is an EU funding instrument for the promotion of innovations in agriculture, which has been implemented in Austria since 2014 and has proven its worth. The operational objectives of the EIP include a successful bridging between modern research, technology and stakeholders, including farmers, representatives from business and industry, extension services and stakeholders. This track contributes to the positive mutual networking between research and agriculture, with education and extension serving as a useful hub for practice. Research is more demand-oriented and results are (more quickly) put into practice. Under EIP AGRI, more than 30 innovation projects involving research, practice and consultancy were implemented between 2014 and 2020.

In general, it can be said that the selective cooperation of different actors in the framework of funded (multi-actor) projects noticeably leads to increased exchange and cooperation within AKIS. The flow of knowledge in the AKIS also seems to have been sustainably improved outside the project activities.

#### **Excursus Cluster Digitisation in Agriculture**

*With its cluster funding "Digitisation in agriculture", the Federal Ministry of Agriculture and Technology has set a new priority within the LE 2014 - 2020 programme in order to make optimum use of the potential of digitisation in agriculture and to increase the acceptance of new technologies.*

*Digitisation makes an important contribution to producing more efficiently and sustainably, keeping rural areas attractive, improving animal health and welfare and avoiding emissions. In addition, the use of digital technologies makes work easier and reduces working hours.*

*By pooling the knowledge of the most important actors in the field of digitisation in agriculture (including research institutions, interest groups, educational institutions, agricultural engineering and barn construction companies, etc.), a large number of the recommendations for action made by the "Digitisation in Agriculture" platform will be taken up and concrete implementation will begin.*

*With a total of € 1.9 million in EU, federal and state funding, the following topics will be addressed over the next 3 years since January 2020:*

- **BUILDING AND TEACHING DIGITAL LITERACY THROUGH THE CREATION OF INNOVATION FARMS**

*On model farms, so-called Innovation Farms, selected new digital technologies, trends and developments in the field of indoor and outdoor business are tested and made visible, tangible and above all applicable. By linking up with education and training and advisory work, skills for the use of different technologies are built up for all age groups and knowledge is quickly put into practice.*

- **CONSULTING & MANAGEMENT**

*Under the title "Simplification of consulting and business management", the range of consulting services and the possibilities in business management will be further developed by incorporating new technologies. The use of geo-information, the availability and machine-readability of the statutory and subsidy regulations are to form the basic prerequisite for more individualised advice and operational decisions.*

- **LEGAL FRAMEWORK FOR DATA MANAGEMENT**

*When using digital machines, devices, programs and other tools, a great deal of data is generated. On the model farms, the data flows are analysed and the associated rights for agricultural enterprises are examined through legal expertise, especially with regard to data sovereignty and data ownership. This is intended to create more clarity and security for agricultural enterprises.*

- **APPROACH AND CRITERIA FOR ASSESSING THE ENVIRONMENTAL IMPACT OF THE USE OF DIGITAL TECHNOLOGIES**

*The use of new digital technologies will change agricultural processes and lead to an efficient use of inputs. A separate project will look at the environmental benefits and risks and develop a "Concept and criteria for assessing the environmental*

*impact of the use of digital technologies". The aim is to develop a concept to assess the environmental impact of new technologies in the field, in the barn and for the whole farm. (BMLRT)*

### **Research programmes and policies**

In the area of research programmes, the departmental research of the Federal Ministry of Agriculture, Forestry, Environment and Water Management and the EU framework research programme Horizon 2020 deserve special mention:

**Departmental research** is an indispensable component of the scientific system and is therefore also important in agricultural research. The BMLRT addresses current social, technological and economic issues, identifies important challenges for tomorrow's society and develops options for action. The departmental research activities are based on projects of the department's own research institutions, the commissioning of research projects on selected topics to external project applicants (2019: approx. € 3.6 million) and the department's participation in European and national research programmes.

The basis for the departmental research activities are five-year research programmes, which contain research priorities for the research-active departments (federal and teaching institutions, federal offices) and the commissioned research of the BMLRT. Currently, the **programme for research and development runs from 2020 to 2025 (PFEIL 25, [link to the programme](#))**.

With the database for research on sustainable development, the Federal Ministry of Agriculture, Forestry, Environment and Water Management also operates a research platform for web-based research control and administration, where the current project results can also be accessed ([www.dafne.at](http://www.dafne.at)).

Through participation in European agricultural research bodies and involvement in programmes, Austrian interests are represented, up-to-date knowledge is helped to shape and more quickly transferred into domestic practice. Therefore, participation in international projects at the interface between research and practice, especially within the framework of the **EU Research Framework Programme Horizon 2020**, is also seen as essential for the further development of the AKIS and the flow of knowledge from research into practice. Agriculture and forestry are becoming increasingly knowledge-intensive. The intensification of

cooperation between the EU Member States and the increased coordination of research activities at national and European level have made great progress in recent years, with Austria achieving above-average success in the ERA-NET programme rail in particular. For small Member States such as Austria, active participation in shaping European research is a worthwhile challenge, as it provides the respective actors with open access to a European area of knowledge and innovation.

For actors from research, such as the University of Natural Resources and Applied Life Sciences (BOKU), participation in international projects with all their challenges and opportunities has long been a reality. Through the introduction and increased application of the multi-actor approach in Horizon 2020, representatives of practice and advisory institutions are also invited to actively participate. However, in Austria these are mostly inexperienced actors in these international funding programmes. Nevertheless, a positive development can be seen in this area. Various agricultural organisations, above all the Chamber of Agriculture, are increasingly involved in international innovation projects. This is to ensure and accelerate the transfer of up-to-date knowledge to Austria, which in turn should lead to better services for operators in Austrian agriculture and forestry. In 2020 the Chamber of Agriculture has established a separate **service centre for international innovation projects** to support agricultural institutions in their participation in international projects.

### 3. History of the advisory system

The education and extension system in Austria is well established and closely linked to the emergence of farmers' representation of interests in general and the development of the chambers of agriculture in particular.

Attempts to represent the interests of the rural population date back to the first half of the 18th century. In almost all regions of Austria the existing arable farming societies were replaced by agricultural societies during this period. The arable farming societies were dedicated to the preservation of rural culture and the representation of interests. In the second half of this century, the arable farming societies were transformed into provincial cultural councils in order to create exemplary farmers' representations based on the model of the established chambers of industry and commerce.

After the First World War, a system of autonomous professional representation of interests was created and in 1922, the first Chamber of Agriculture was founded in the province of Lower Austria. Within a decade, chambers were also established in the other provinces. According to the Federal Constitution, the professional representation of agriculture and forestry is the responsibility of the provincial governments. For this reason, the provincial chambers established a joint federal organisation in 1923. In 1953 the Austrian Chamber of Agriculture became a legally recognised body.

Since their foundation, the regional chambers of agriculture have played an important role in advising and supporting their members in legal, economic, technical and socio-political matters. Since membership of a Chamber of Agriculture is compulsory, all farmers are entitled to these services by law.

The idea of cooperatives reached Austria at the end of the 19th century and the first agricultural cooperatives were founded. Since then, storage and dairy cooperatives have become established in Austria. Due to mergers in the last 20 years the number of cooperatives has rapidly decreased. Consultancy is an important part of their service offer. However, this is limited to the specific sector and the product groups offered. Breeders and producers of livestock, cereals, fruit and vegetables are organised in several dozen associations in Austria. Other, but numerically smaller associations exist in the forestry, biomass, beekeeping and

fisheries sectors. Some of these also offer educational and advisory services but are often integrated into the chambers of agriculture.

The first machine pools (machinery rings) were founded in the 1970s.

While in the first years after the Second World War advisory services were financed under the Marshall Plan, in the following years the state gradually took over. Over the years, the Austrian advisory structure (based on the Chambers of Agriculture) and strategic orientation has been continuously developed further in response to political and economic developments and the emergence of new thematic trends.

National research institutes, federal agencies and offices as well as independent scientific organisations play a subordinate role in the advisory activities and only offer support and information directly to farmers and foresters on a few selected topics. However, some schools and training institutes have developed into well-known information and knowledge providers and drivers of innovation.

Several changes in the political and economic system in the 1990s had a major impact on agriculture and thus also on advisory and support services. Accession to the EU in 1995 brought with it new political and legal guidelines which called for increased privatisation, commercialisation and cost reduction of services. Within the framework of the EU's Common Agricultural Policy (CAP) the Austrian agricultural sector was fundamentally reformed. Global cooperation increased both competition and price erosion. The advisory and support services were therefore primarily aimed at helping farmers to cope with the new economic framework conditions and to adapt the agricultural subsidy system to EU requirements. The importance of the Chamber of Agriculture continued to grow during this period, but public support for advisory services began to decline. In return, however, public funding for training measures was massively increased thanks to EU funding.

## 4. The agricultural and forestry advisory service(s)

### 4.1 Overview of all service suppliers

The **Chambers of Agriculture (LK)** are still the first address for most farmers seeking support through extension services and the backbone of the Austrian AKIS. Bringing together initial (LFAs) and continuing training (LFIs) extension services and various professional associations under the umbrella of the Chamber of Agriculture enables close coordination and a well-functioning flow of knowledge between the central elements of the AKIS. The additional role of the LK as a legal representative of interests and, in part, a subsidy processing agency completes the "one-stop shop" principle in the areas of extension, subsidy and training for agricultural and forestry enterprises.

The Chambers of Agriculture offer an attractive range of training and advisory services for farmers and are represented in all 9 federal states with a Chamber of Agriculture and, depending on the size of the federal state, with several offices in the regions. The comprehensive and cost-effective range of advisory services supports farmers and foresters to act on their own responsibility in farm management and successful business development in all matters relating to agricultural and forestry management.

In addition, consulting services are provided by **associations**. In the field of organic consulting, the Chambers of Agriculture work together with **BIO AUSTRIA**, the largest Austrian organic association, under the umbrella of ARGE Bioberatung.

**BIO AUSTRIA** is organised as an association. The most important part of the organisation are the members, who are also the owners: 12,500 Austrian organic farmers. BIO AUSTRIA consists of a federal organisation and eight provincial organisations and is therefore represented throughout Austria. BIO AUSTRIA supports its members in marketing their products and offers competent advice in all areas of organic farming.

**Private consultancy providers** are partly represented in special and niche topics but play a subordinate role in the AKIS as a whole.

The **forestry advisory services provided** by the Chambers of Agriculture are complemented by offers from the state forestry services, smaller private

engineering firms and forestry service organisations as well as the forest associations (depending on the federal state).

The methodological training and further training of agricultural and forestry advisors is provided by the **College of Agricultural and Environmental Education (HAUP)**.

## **4.2 Public policy, funding schemes, financing mechanisms, advisory service providers**

Efficient advisory services are also seen by the agricultural policy as a strategic success factor for strengthening the competitiveness of agricultural and forestry enterprises in Austria. The BMLRT therefore supports extension services in several ways, for example through strategic control, agreement on extension priorities and extension programmes, a subsidy for the personnel costs of extension staff, the preparation of extension documents and aids, and the specialist and methodological further training of extension staff in cooperation with the College of Agricultural and Environmental Education and the teaching and research institutions of the BMLRT.

### **Advisory support 2017-2021**

Since 2017, support for agricultural and forestry extension services at federal level has been provided via two tracks: from funds of the LE 14-20 programme and, in addition, from purely nationally financed federal funds. For this purpose, a public procurement procedure was carried out in advance, from which a service concession contract was awarded to ARGE LK Beratung (consortium of all chambers of agriculture) and to ARGE Bioberatung (consortium of chambers of agriculture and Bio Austria) for the years 2017 to 2021.

Each year, 8.5 million euros are available, of which 5.06 million euros come from LE funds (EU, Federal Government, federal provinces) and 3.44 million euros from national funds (Federal Government). ARGE Bioberatung accounts for around 470,000 euros for subject-specific organic consultancy. The funding is a personnel cost subsidy for advisors with a specific technical and methodological qualification (prerequisite for funding) who advise farmers on specified topics using specified methods. The catalogue of topics, which covers a total of eleven areas of advice,

also includes the contents of the Farm Advisory Service ("FAS"), which is prescribed by EU law. This funding will subsidise almost 300,000 hours of farm advisory services (Green Report 2020).

The consulting services provided are documented annually in a federal consulting report. This also forms the basis for any necessary adjustments to the minimum hours or funding amounts for individual subject areas.

In addition, the Chambers of Agriculture, which were set up under the Federal State Law, finance their advisory services largely through compulsory **contributions from their members** (all farmers and foresters) and through **subsidies from the federal states**. For historical reasons, there is only a very limited number of fee-based advisory services.

#### **Financing of the further training of the counsellors**

The nationwide further training of extension staff is supported by the Federal Ministry of Agriculture, Forestry, Environment and Water Management with about 100,000 euros per year and implemented within the framework of the extension training plan of the College of Agricultural and Environmental Education.

With regard to the **design of the support system for the advisory system for the new Common Agricultural Policy CAP**, which is expected to enter into force from 2023 onwards, the following challenges are of particular importance for the future of the advisory system:

- Ensure and increase funding for counselling and training after 2021 and in the new CAP from 2023
- Provision of a comprehensive and high-quality range of advisory services in all federal states to support the implementation of the nine specific objectives and the cross-cutting objective of the CAP 2020+ with a stronger focus on results
- Promotion of inter-state cooperation and the cooperation of various providers in the development and implementation of nationwide counselling and further training programmes
- Covering the need for advice on special and niche topics in all federal states
- New support and business models for continuing education and counselling

## 4.3 Clients and topics and methods

### Customers and clients

The clients of the advisory service are all persons working in agriculture and forestry. A representative telephone survey of Austria's farmers commissioned in 2015 (sample: 3,000 farms) produced the following result:

- Almost every farmer (97%) had a contact with the Chamber of Agriculture in the last 2 years.
- 88% of the farms in contact with the Chamber of Agriculture used advisory services.

### Topics

Customers appreciate the comprehensive, comprehensive and high-quality range of advisory services, which offers solutions for all questions relating to agricultural and forestry management. The range of services offered by the Chamber of Agriculture covers a broad spectrum of topics from the construction of agricultural buildings, business administration and management, agricultural and forestry production in all sectors to advice on tax law and social issues. Furthermore, professional associations offer specific consulting services, e.g. Bio Austria for questions concerning organic production. (<https://www.bio-austria.at/bio-bauern/beratung>)

The presentation of the comprehensive extension services can be found on the homepage of the respective Chamber of Agriculture ([www.lko.at](http://www.lko.at)) or BIO Austria ([www.bioaustria.at](http://www.bioaustria.at)) and the presentation of the educational offers on the respective homepage of the LFI ([www.lfi.at](http://www.lfi.at)). An overview of all LK counselling and LFI educational offers can be found in the education and counselling map ([www.lfi.at/blk](http://www.lfi.at/blk)).

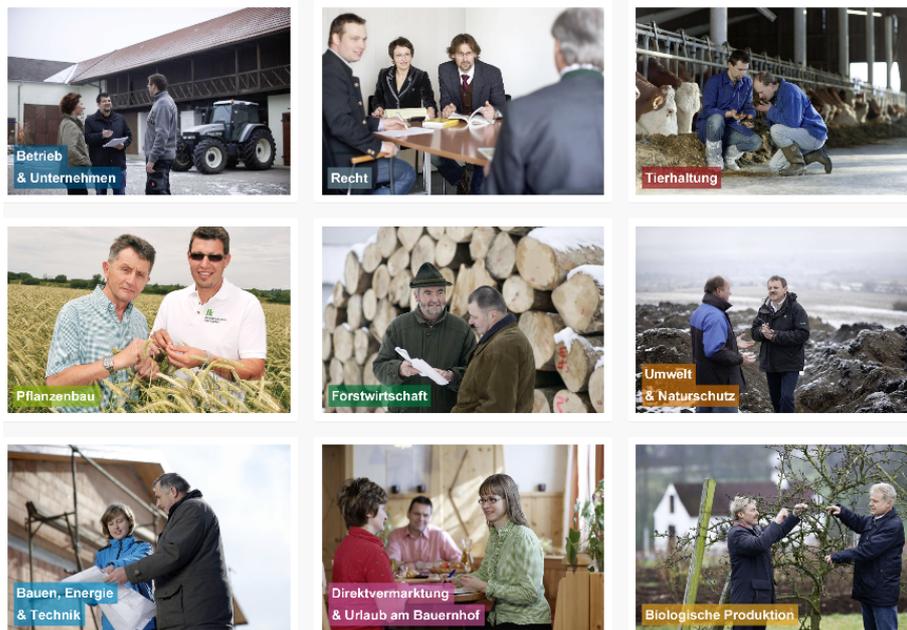


Figure 11 Advisory services offered by the Chambers of Agriculture

The main focus of advice and the most frequent advisory contacts are in the following areas

- Advice on EU-funded, EU co-financed and national subsidies,
- Legal, tax and social security issues,
- Topics of business administration and business development,
- improving competitiveness (new and optimised agricultural production methods in all sectors of the farm)
- Construction of economic facilities and operational buildings
- Forestry and forest management

Topics of public interest such as nature conservation and environmental protection and cross-sectional issues such as digitisation are usually not taken up as independent offerings. By embedding these topics in the broad range of educational and advisory services, they can be transported in the production technology or business management offers.

The quality management of guidance and education providers (which is obligatory in the context of funding) ensures the continuous development of the services offered. The focus on customers ensures that the services are developed in line with needs. Although customer demand is constantly changing, guidance

and counselling providers react quickly and new services are constantly being developed or services that are no longer required are withdrawn from the programme (see Chapter 4.5).

Due to the Austria-wide presence, counselling and education offers can be prepared and implemented in campaigns as required. The regional presence with offices enables a target group-specific orientation of the educational and counselling offers.

The Chambers of Agriculture stand out with this regional offer:

- Practical and demand-oriented offer through proximity to customers with advice centres in the regions
- Austria-wide joint further development of consulting services

As a result of its membership of the Chamber of Commerce, all agricultural and forestry enterprises are reached across the board using different media and methods.

## Methods

A further success factor in addition to the comprehensive range of topics is the variety of methods used to provide consulting services. Different methods are used depending on the occasion and the consulting request. They range from individual counselling in the office of the counselling organisation, individual counselling on site at the agricultural and forestry enterprise, through written or telephone counselling to group counselling. Advice on digital methods is also increasingly offered.

### **Excursus on online consulting**

Modern guidance must include the use of **online guidance** and digital guidance tools. Especially in connection with the restrictions on counselling work in the wake of the Covid-19 pandemic, the importance - and also efficiency - of online counselling services became apparent in a "contactless" (i.e. without physical presence) manner. Furthermore, the digital age of electronic data generation and analysis allows more accurate, faster and better decisions on farms.

Extension services must embrace these digital tools and exploit the great potential for increased farm productivity and sustainability.

Currently, the Chambers of Agriculture are also working on digitising the advisory process itself in order to be able to use the new digital methods in as many areas as possible. Fortunately, even before the Covid-19 pandemic, important steps towards digitisation were taken (promotion of the use of online meetings, expansion of online courses and webinars, expansion of online content, further training of staff in the field of digital competence, etc.), which were successfully built on and on which the counselling work could be continued even during the crisis.

In order to do justice to the changed working and communication conditions of the counselling clients in the digital age, a greater diversity in counselling methods and expansion of the understanding of counselling to include communication in general, the greater use of interaction and participation possibilities, flexibility and reflexivity of the new media/the Internet, the expansion of the use of Internet-supported forms of communication in counselling work as well as the targeted introduction of digital counselling tools in the specialist areas are necessary.

This trend towards digitisation is also reflected in the required skills of the guidance staff. In this respect, in 2020 the focus was placed on strengthening the digital competences of counsellors, in 15 continuing education events around 230 counsellors were reached on the subject of digital methods.

Important impulses have also already been given at the University of Applied Sciences for Agricultural and Environmental Pedagogy to integrate, among other things, the topic of digitisation into initial and continuing education and training. In the Master's programme "Agricultural Education and Counselling" which has just been launched, there are many courses relating to digital topics, such as Digital Learning Spaces, Digital Transformation in Society, Education and the Economy, Digitisation in Agriculture as a Challenge for Counselling, "Smart Farming" in Practice.

The university course "School 4.0: Make yourself fit for the future" includes e.g. web-based applications for teaching, about copyright but also media training and presentation design. In addition, numerous topic-related conferences are always held at the University of Applied Sciences for Agricultural and Environmental Education as part of the nationwide advanced training of advisory and teaching staff. In 2019, for example, the conferences: "Agriculture 4.0: Opportunities and challenges for business management in farms" or "Digitisation - potentials for education, extension and knowledge transfer", which were organised in

cooperation with the IALB and the Austrian Chamber of Agriculture, took place. (Green Report 2020)

Most of the time available in advisory organisations is spent on advisory purposes, ranging from advice on production, technical and business issues to advice and support on aspects of participation in public funding programmes. A process description with Austria-wide minimum standards has been defined for the core process of counselling. One of the most important process steps at the beginning of the counselling process is the clarification of the assignment. Here, the feasibility is getting checked and the request is assigned to the responsible service provider with the corresponding offer. The subsequent provision of services based on the contents, processes and methods defined in the product master data sheet guarantees a high-quality and uniform implementation of the consultancy service.

**Individual contacts account for** the largest share of all interactions with customers. Advice is provided primarily through telephone conversations and electronic replies to enquiries, followed by direct contact with the farmer on the premises of the advice organisation and farm visits with the aim of developing specific recommendations or proposed solutions. On-the-spot advice or assistance in developing a new strategy or diversification of income and products is less frequent due to limited resources and the high costs involved.

**Group counselling** is a very popular method of reaching a large number of clients, focusing on the process of generating learning and innovation through interaction between the actors involved. A good example of this are the special offers of working group counselling (practice-oriented CET events, exchange of experience, branch evaluations with comparisons of key figures, excursions).

In addition to the classical counselling methods, counsellors are often invited as experts to give **lectures** at training courses and events. Other very relevant sources of information for farmers are **professional articles** distributed via print or online media. For this purpose, advisors are employed as specialist authors.

The **expertise of consultants** is also in demand in thematic working groups. The team of consultants has also formed various networks and committees and meets regularly to exchange ideas and information and to strategically orient and further develop the range of services. Further activities include professional articles and

other material, the organisation of training and further education events and participation in seminars for personal development.

They also act as translators of legal and administrative texts and spend a lot of time helping farmers to meet funding and administrative requirements.

To a lesser extent, guidance organisations are involved in research activities and networks: Consultants formulate knowledge needs and problems from practice and bring them into the research. Subsequently, counsellors ensure the transfer of the generated knowledge and research results into practice.

In addition, the documentation and administrative work associated with the proper handling of the consultancy grant accounts for a considerable part of the day-to-day business.

## **4.4 Human resources and methods of service provision**

Modern agricultural and forestry extension services must set the tone for future developments in agriculture and forestry, meet the high demands of customers and cover the entire spectrum from technical to process extension. For this reason, special emphasis is placed on the training and further training of advisory staff in both the technical and methodological fields. For only agricultural and forestry extension services characterised by technical, methodological and social competence help farming families to secure and further develop their income and the farm in the long term through entrepreneurial competence, clear goals and by strengthening their personality.

The Chambers of Agriculture (LK) have decades of experience in all areas of agricultural and forestry consulting. Due to the large number of consulting cases, the LK consulting service has a comprehensive competence. This experience and knowledge gained from day-to-day consulting practice make the LK employees proven experts in their field. This makes it possible to achieve comprehensive solutions for complex problems in the company by all the specialist departments in the network and to create a holistic picture.

The holistic and cross-sectoral approach is lived out comprehensively in the Chambers of Agriculture in all advisory areas and at all levels:

- The Chambers of Agriculture offer consulting services in all consulting areas, as they have decades of experience and competence based on an enormous amount of consulting cases in all issues relevant for agricultural and forestry enterprises.
- The counsellors from all counselling areas work door to door in the offices and network systematically via working groups and spontaneously on current counselling cases. This ensures that comprehensive solutions are developed for complex problems at the company.
- Another major advantage is the involvement of experts from the Chamber of Agriculture in the development of legislative amendments and in the assessment process prior to the enactment of legislation. In this way, practice-relevant criteria can be incorporated into the drafting of legislation and, in addition, expected legislative changes for agricultural and forestry enterprises can be taken into account in the consultation.
- Likewise, the systematically networked product development in education and counselling results in useful interfaces with adjacent specialist areas.

Counsellors usually work with their organisation for a very long time. More than half stay with their organisation for more than 10 years. About 1/3 of all counsellors have more than 12 years of professional experience. This rather low fluctuation rate can be seen as conducive to knowledge management within an organisation. In recent years, however, a higher fluctuation of staff has been observed, which poses great challenges for the counselling organisations in individual counselling areas.

#### Qualification of the advisory staff

The general level of experience and training of counsellors in Austria is high. Many counsellors run a business themselves. The majority of all counsellors have completed a university degree and participated in training courses at least once a year. In addition, many counsellors have completed a university course in counselling and adult education or a training course in agricultural pedagogy at the College of Agricultural and Environmental Education.

In the area of methodological further training for counsellors, it should be mentioned in particular that the counselling support for ARGE LK consulting and

ARGE organic consulting is subject to the condition that 75% of the subsidised counselling services are provided by staff who have completed a university-level methodological-didactic training course at the College of Agricultural and Environmental Pedagogy to the extent of 60 ECTS or can provide evidence of equivalent training elsewhere. For the other 25% of the funded consultancy services, proof of methodological-didactic training amounting to at least 32 teaching units is required. Counsellors with many years of professional experience and corresponding continuing education and training can also have formally, non-formally and informally acquired competences credited within the framework of the competence assessment and certification procedure based on the curriculum of the university course "Professionalisation for Counsellors and Trainers" at the University of Agricultural and Environmental Education.

The professional qualification required for the promotion of guidance and counselling services is a degree from a higher agricultural and forestry school (HBLFA), college or university. By means of the quality management system implemented in accordance with the BMLRT's funding requirement, the counselling providers ensure the necessary training and ongoing further training of their counsellors. Requirements for the initial professional qualifications and necessary ongoing professional training are clearly regulated at the level of the counselling products. In general, an organisation-internal obligation to provide further training for counsellors of at least 25 hours per year applies, which is usually significantly exceeded in practice. Regular top marks in the context of customer satisfaction measurements with regard to the professional and methodical competence of the consultants confirm this strong focus of the organisation on employee training as a success factor.

Numerous specialist and methodological further training events are conducted annually through the nationwide further training plan for extension workers supported by the Federal Ministry of Agriculture, Forestry, Environment and Water Management, which is implemented via the College of Agricultural and Environmental Education (HAUP). With regard to the topics of the further training courses, two trends can be identified: On the one hand, training courses on production technology and specialist issues are frequently attended (e.g. fruit and vegetable production, rare species, organic farming, renewable energies, plant and animal production, pasture management, IT). On the other hand, "soft skills" as well as social and methodological issues are increasingly in demand (e.g.

methodology and didactics, coaching, time management, personal competence development, dealing with difficult situations in consulting work, general consulting techniques, communication, project management). Dealing with digital media and methods is also an increasingly important continuing education topic for consultants.

According to the evaluation studies carried out on livestock farms, veterinarians are also important persons for advice recommendations due to their frequent farm contacts. It would therefore make great sense to offer this target group more nationwide continuing training courses in technical and methodological terms than has been the case to date.

## 4.5 Programming and planning of advisory work

As mentioned above, the Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLRT), among others, sets priorities and guidelines for the advisory work through the thematic structuring and financial endowment of the individual advisory areas in the advisory support. In addition, there are strategies of the federal provinces and the individual guidance providers, which are often developed in cooperation between management, guidance staff, customers and public authorities.

The concrete planning and implementation of the consulting services is carried out in a standardised manner within the framework of quality management: The Chambers of Agriculture and also Bio Austria have implemented a quality management system certified according to ISO 9001. The existence of a recognised QM system for counselling and adult education is a funding requirement of the BMLRT.

Measures and processes as well as precautions for planning the range of counselling services, ensuring and further developing innovative approaches in counselling are ensured by systematic annual planning and improvement management or by measures for continuous improvement within the framework of the quality management system. For planning, comprehensive key figures from the electronic service recording system, which is uniformly used throughout Austria, can be used.

The further development of innovative approaches in guidance is supported in particular by

- the process of product development and
- the results of customer surveys and customer feedback
- the results of commissioned evaluation and needs studies
- the error and improvement management

Appropriate measures in the quality management system ensure that the perception of new customer requirements (e.g. through customer surveys, customer workshops, expert interviews, ...) leads to the development of corresponding products.

Furthermore, the good networking of education, counselling, schools, science and research will ensure that new innovative offers are developed in line with demand, in line with the market, customer-oriented and more target group-specific. The demand and evaluation studies supported by the BMLRT also contribute to the needs-based design and implementation of education and counselling services.

## 4.6 Linkages with other AKIS actors/knowledge flows

The advisory service provided by the Chamber of Agriculture, which has been established over decades, is an indispensable component in the network of adult education, advisory services, the BMLRT with its teaching and research institutes and the Federal Provinces. The good connections to provincial offices, agencies, authorities and ministries enable a demand-oriented coordination of the content of tasks and advisory services.

LK is not only the central consulting provider in Austria. CET is provided by the educational organisation of the LK, the rural further training institute (LFI, see Chapter 2.2). Vocational training is carried out by the Apprenticeship and Skilled Workers' Office (LFA, cf. Chapter 2.2) affiliated to the Regional LC. Many other trade associations are also based in the LK. Bringing them together under the umbrella of the LK enables close coordination and a well-functioning flow of knowledge between the elements of guidance, initial and continuing vocational training which are central to the AKIS.

Through its decades of cooperation with other professional associations and agricultural organisations, LK consulting has already proven in the past that it can successfully implement cooperative objectives in a coordinating role.

In addition, the LK is carrying out targeted activities in the field of AKIS coordination to stimulate the exchange between actors in research, education and counselling, and is thus fulfilling its role as a "bridge between research and practice" and backbone of the Austrian AKIS.

Through active participation in the national network for rural development (Netzwerk Zukunftsraum Land), the Chamber of Agriculture also makes a significant contribution to the successful implementation of the Austrian Programme for Rural Development and the networking of agricultural stakeholders.

The good cooperation with universities, universities of applied sciences, scientific institutions, agricultural and forestry colleges and other subject-related institutions should also be emphasised. This not only ensures that the contents taught by the consultants meet the latest standards, but are also the important transmission of theory, science and practice, which is essential for the personal and operational development of the customers and thus also for rural areas. There is close cooperation with the University of Applied Sciences for Agricultural and Environmental Pedagogy, especially in the area of initial and further training of the counsellors and the evaluation and further development of the counselling and further training offer.

Networking beyond national borders is also considered important and is therefore actively sought. In addition to participation in international innovation projects, networking with the international/European consulting community via the mergers of consultants and consulting organisations is of particular importance here. The most important network partners here are, for example

- International Academy for Rural Extension (IALB)
  - o The International Academy for Rural Counselling (IALB) was founded in 1961 and started as an association of counsellors from the German-speaking countries. In the meantime, counsellors from more than ten European countries belong to the IALB. The focus is on the promotion and further development of counselling and

- education through conferences, seminars, exchange of experience and project work. ([www.ialb.org](http://www.ialb.org))
- European Forum for Rural Advisory Services (EUFRAS)
    - o EUFRAS is a European network and association of public and private agricultural and forestry consultancy organisations. ([www.eufras.eu](http://www.eufras.eu))
  - Global Forum of Rural Advisory Services (GFRAS)
    - o GFRAS is the global umbrella organisation for regional advisory networks (such as IALB and EUFRAS). The objective of GFRAS is to improve and increase the visibility of extension services and to better integrate them into systems of agricultural innovation.

## 4.7 Advisory organizations forming the FAS and evaluation of their FAS implementation

In accordance with EC Regulation 1782/2003 the Farm Advisory System (FAS) was introduced in Austria in January 2007. The BMLRT commissioned the 9 regional chambers of agriculture to administer the FAS and to continuously monitor its activities. The obligation to make the services of the FAS available to farmers was included in the consultancy contract between the Ministry and the Chambers of Agriculture. The services provided by the FAS are thus based on the existing advisory system of the chambers and are closely linked to their structures and services. The Ministry remained responsible for the coordination and supervision of the FAS. Apart from these standard interactions within and between the different levels of the chambers and the regular interactions with the Ministry, there is no other specific coordination and interrelation with other bodies or services.

The FAS was financed by purely national funds until 2017. Since 2017, EU co-financed funds (under the LE 14-20 programme) have also been used. The services provided by the FAS are directed equally to all farmers in Austria and are largely free of charge. No specific target group was identified, but farms with an above-average share of direct payments were specifically informed during the period of introduction of the system.

The services provided by ARGE LK-consulting with regard to training and advisory services for farmers to ensure compliance with the legal provisions on farm advisory services (FAS) under Article 12 of Regulation (EC) 73/2009 are governed by the service concession contract of ARGE LK consulting. Articles 12 to 15 of Regulation 1306/2013 list the requirements for the farm advisory services (FAS). According to these, the Member States are obliged to set up a "system of farm advisory services on land and farm management issues", which also requires "appropriately qualified and regularly further trained advisors".

In this context it is important to mention that the Chambers of Agriculture have been providing their customers with comprehensive information on environmental, health and safety issues for many years. The aim has always been to support farmers who wish to comply with standards in the fields of environmental protection and human, animal and plant health and animal welfare. From 2005 onwards, services also covered specific cross-compliance issues to help prevent infringements of the legal provisions of cross-compliance, which ultimately lead to the reimbursement of payments received. The advice now covers issues defined in Regulation (EC) 1782/2003. It also goes beyond this area and covers other important environmental, health and safety issues, as the standards of the national agri-environmental programme ÖPUL often go beyond those of cross-compliance. From 2007 onwards the Chambers organised events and presentations and produced a number of tools such as folders, articles and other (online) publications, manuals and checklists to inform their customers specifically about FAS and cross compliance.

The Farm Advisory System (FAS) comprises

- cross-compliance obligations at farm level,
- agricultural practices conducive to climate and environmental protection, including the maintenance of agricultural land in a condition suitable for cultivation or grazing
- the LE 14-20 programme provides for measures at farm level to modernise farms, promote competitiveness, integrate the sector, promote innovation, market orientation and encourage entrepreneurship
- requirements at the level of the beneficiaries, as laid down in the Nitrate Action Programme and the National Water Management Plan

- NGP 2009, such as in particular inputs and discharges of pollutants and water abstractions
- the general principles of Integrated Pest Management applicable to beneficiaries
- the minimum requirements for the use of fertilisers and plant protection products set out in the LE 14-20 programme

ARGE LK-consulting covers all the legal areas of FAS mentioned above. FAS or CC relevant counselling and educational contents are often a cross-sectional matter or only a partial aspect of a customer's counselling request and are therefore to be found, for example, in the area of responsibility of economic, construction and production counsellors, head office consultants, etc. CC and FAS thus represent cross-sectional subjects in the most diverse specialist areas and consultancy requests. The fact that CC advice is usually not taken up in isolation as such but is covered within the framework of specialist advice and information makes it difficult to record these services quantitatively and qualitatively. This fact has been taken into account in the service recording in which, on the one hand, a separate service recording product is used if the CC share is predominant. In addition, a defined percentage of the CC share of defined topics with CC relevance is shown for the respective consulting topic.

Different ways of providing support are chosen.

Thus, in addition to many training and guidance products, in which cross compliance relevant issues are included to a greater or lesser extent, there are some guidance products which mainly or exclusively cover CC relevant issues. Among these guidance products, individual on-farm and thematic guidance and specialised workshops in small groups in the guidance institution are the most common approaches. Group consultations on the farm are also popular. The provision of specific and general information is ensured by the Internet and various publications in printed or digital form.

A large part of the FAS advice is covered by information and further training measures, whereby the CC-relevant topics are included to varying degrees in the numerous events. The formal further training of farmers required by the regulation is organised by the Chambers of Agriculture in cooperation with the LFI.

In addition, as mentioned above, CC-relevant content is included in all discussions where there is a connection to CC content. This is often the case with questions about ÖPUL regulations.

The BMLRT and ARGE LK consulting are responsible for ensuring the qualification and further training of FAS advisers. No formal accreditation procedure is carried out for the selection of the advisers. They must prove their qualification on the basis of certain criteria. In cooperation with the market organisation agency Agrarmarkt Austria they receive ongoing training.

A large number of advisors to the chambers deal with FAS-related issues.

Performance and effectiveness are checked by controls of Agrarmarkt Austria within the framework of regular monitoring, by the evaluation of various reports and by customer surveys. A manual with checklists for the control staff was prepared as an instrument for checking compliance during on-the-spot inspections. It contains instructions and the indicators to be checked for each of the statutory management requirements set out in Annex III and the GAEC standards set out in Annex IV. An annual FAS advisory report is sent by ARGE LK consulting to the BMLRT. It contains the key figures and serves as proof of the provision of FAS consultancy services.

### Evaluation of the implementation of FAS

The FAS is integrated into the advisory system of the Chamber of Agriculture and thus operates within a broader framework for advising farmers.

Long before the introduction of the FAS in 2007, the Chamber of Agriculture advised its customers on environmental standards, human/animal/plant health and animal welfare issues as part of the regular extension of the FAS. The introduction of the FAS was seen more as an administrative burden, as farmers could not see any additional benefit. The demand for explicit cross-compliance advice fell rapidly after the initial activities at the beginning and is still low. As a result, cross-compliance advice is now largely transported through integration with training and advice on other technical farm issues.

This structure has proved to be the most effective and productive, as it links a subject of public interest, such as cross-compliance, with other areas of advice important to the farmer, i.e. technical and economic issues. This is also documented by the very low number of claims resulting from cross-compliance

infringements. Experience shows that advice which integrates public and private interests reaches the farmer more successfully than advice which primarily serves the public interest and is "little" important to the customer.

On the basis of this experience, it is proposed that advice on cross compliance should be better embedded in the advisory activity and linked to other issues, rather than pursuing it alone. When the overall picture is presented and understood, it can be expected that there will be a greater understanding of the idea of cross-compliance standards and commitment to their application.

There is a risk that the compulsive nature of the FAS may drive some farmers out of business. Small farmers in particular may find it particularly difficult to comply with the Regulation. It is important to note that the application of cross-compliance rules often involves costly investments which farmers may not be able to afford.

The complexity of the CC provisions and the resulting distribution of CC-relevant topics among numerous specialist areas and also among a large number of employees remains the central challenge for education and counselling. CC-relevant educational and counselling contents are often a cross-sectional matter or only a partial aspect of a customer's counselling request and are thus found, for example, in the area of responsibility of economic, construction and production counsellors, etc.

A distinction between cross-compliance and additional requirements based, for example, on national rules or on the participation of the farm in other measures or quality programmes which are not part of cross-compliance, but which farmers must nevertheless comply with is a major challenge in the area of guidance.

In conclusion, it can be said that the transport of the FAS consulting contents embedded as a cross-sectional matter in a broad range of agricultural and forestry consulting services for the managers of agriculture and forestry as well as for the consulting providers and the administration is a successful path which is to be continued and further developed.

## 5. Summary and conclusions

### 5.1 Summary and conclusions on sections 1 - 3

Austria has a small but highly developed agricultural sector. It is characterised by a small-scale structure, a large proportion of mountain areas and less-favoured areas. Over 90% of the approximately 162,000 agricultural and forestry holdings are family farms. About 143,000 of the farms have a forest share and manage 80% of the total Austrian forest area. About two thirds of all farms are run on a part-time basis. About 26% of the agricultural area is managed by about 22% of the farms according to the principles of organic farming, a top value in Europe and worldwide. Austrian agricultural and forestry holdings naturally operate in a difficult environment. A difficult natural environment, global competition and market dependence, increasing and rapidly changing demands and expectations on agriculture are some of the challenges farmers have to face. A large number of small and family farms therefore find it difficult to compete and stay in business and are highly dependent on public payments. Low-threshold and low-cost access to knowledge and high-quality training and extension services play an important role in meeting these challenges. It is therefore important to ensure that the well-established and efficient nationwide education and guidance system can be maintained and developed in the future. In particular, an administratively simplified and financially well-funded promotion of training and guidance is seen as central in this context under the new CAP.

The Austrian **Agricultural Knowledge and Innovation System (AKIS)** is based on a) comprehensive vocational training, b) adult education, c) a comprehensive and high-quality range of advisory services and d) an agricultural research landscape. An essential cornerstone of the AKIS is the cooperation between research, education and extension.

Against the background of the natural and economic framework conditions of Austrian agriculture and forestry and since multifunctional agriculture and forestry and the viability of rural areas are of great public interest, the AKIS is strongly influenced by public or, to a large extent, publicly financed actors. These are for example the BMLRT with its teaching and research institutes, the federal offices and provincial governments of the nine provinces, the chambers of agriculture with the rural further training institutes (LFIs) and apprenticeship

offices (LFAs), various training, further training and research institutes such as the University of Applied Sciences for Agricultural and Environmental Education (HAUP), the University of Natural Resources and Applied Life Sciences, Vienna (BOKU), schools, associations and some NGOs. Private companies play a lesser role in AKIS.

Responsibilities are generally clearly defined and divided between the organisations at federal and state level. Cooperation between the actors and the flow of information within the AKIS is good, overlapping of responsibilities and competition are rare.

A comprehensive and well-functioning agricultural education, training and advisory system covering the whole country is considered very important for the development of agriculture, forestry and rural areas in Austria. In practice, education and extension often go hand in hand. The organisations, above all the Chambers of Agriculture, often offer both training, CET and extension. The line between education and training and counselling is therefore blurred. Tailor-made, coordinated CET and guidance services from a single source are highly appreciated by participants and also contribute to an efficient use of funding. Furthermore, the embedding of cross-cutting issues such as cross-compliance or nature and climate protection in a broad range of agricultural and forestry advisory services enables an efficient transport of these topics of high public interest.

For the evaluation and, if necessary, reorientation/improvement of the educational and extension services, evaluation and needs studies are continuously carried out in cooperation with the University of Agricultural and Environmental Education and other scientific institutions. In addition, nationwide projects funded by the BMLRT (M1 Education) provide significant support for the assessment of needs, development, application and coordination of nationwide education initiatives.

The quality management of the guidance and education providers (which is obligatory within the framework of the funding) also ensures the continuous development of the services offered. In this way, new topics (such as digitisation) or new methods of knowledge transfer (e.g. online formats) can be taken up

relatively quickly in the AKIS and Austria-wide priorities and campaigns can be implemented.

Nonetheless, agricultural and forestry education and extension organisations find themselves in an increasingly conflicting situation between rising customer demands, increasing competition and declining public funding, with historically low willingness to pay for high-quality services.

There seems to be a broad consensus on the importance of research, cooperation and know-how transfer through education and guidance as drivers of innovation. While the Austrian AKIS is characterised by very close links and a well-functioning knowledge flow between the central elements of guidance, VET and CET - the Chambers of Agriculture are the central AKIS actors here with their comprehensive range of guidance services, the affiliated Rural Training Institutes and the apprenticeship and skilled worker positions - the links to public research institutions are partly less pronounced.

As already stated in the AKIS Report 2013, the transfer between research and practice in Austria basically works well, even if the transfer of information is slow and there is no regular, institutionalised exchange between all actors. Since the last report, existing links have been further strengthened or new ones established, the speed of transfer has also increased, at least selectively. Among other things, the EAFRD support within the framework of the Austrian Programme for Rural Development 14-20 could be used in a targeted manner to improve cooperation and the flow of knowledge within AKIS. Here, above all measure 1, education, measure 2, counselling and measure 16, cooperation (inter alia EIP-Agri, clusters) were successfully used to better network AKIS actors and pool resources. There is also public support in the area of national funding with relevance for AKIS, especially in the field of research (Research Framework Programme PFEIL).

### **Recommendations:**

As AKIS and its actors are largely dependent on public support, a continuation and expansion of the AKIS-relevant support system is necessary. In this context, it is particularly important that the AKIS-relevant support measures (especially in the areas of counselling, education, innovation) are comprehensively designed and adequately funded in the national CAP strategic plan. The lean and well-integrated structure of AKIS has also proved its worth in European comparison. In order to

continuously ensure efficient use of funding, the focus should continue to be on established organisations with a wide range of services and cooperation rather than competition between them.

The Austrian AKIS continues to be a successful model and serves the needs of Austrian farmers and foresters. However, there is still no consistent AKIS policy. Within the framework of the national CAP strategic plan it is to be shown, among other things, how the cross-cutting objective "Knowledge, innovation and digitisation in agriculture and rural areas" is to be achieved, the AKIS will play a central role in this. There is a need for further action with regard to alignment, structure, coordination and speed of exchange. There is still no institutionalised exchange of all actors. For a better networking of the AKIS actors, an institutionalised (and financed) body would be necessary to enable an organised exchange between practice, counselling, further training and research. This could be located at important organisations of the Austrian AKIS such as the BMLRT or the Chamber of Agriculture, which as a central counselling and education organisation takes on the bridge function between research and practice and already sets up targeted activities in the area of AKIS coordination.

The transfer of research results and findings into practice could also be improved by making research more demand-oriented and preparing the results in a practice-oriented way. This could be done, for example, by:

- Greater involvement of guidance and training organisations from the outset in the coordination and implementation of research projects in order to ensure acceptance, practical relevance and subsequent rapid dissemination of the results. The application of the multi-actor approach, which has already been successfully implemented in EIP-Agri and Horizon 2020, in further research projects and funding programmes would be appropriate here. Knowledge transfer organisations involved in research projects in all phases would thus be able to bring in demand directly from practice, collaborate in the development of knowledge and subsequently quickly put the results back into practice. Successful examples such as the digitisation cluster or EIP-Agri projects suggest that the application of this multi-actor approach will improve the acceptance, practical relevance and subsequent rapid dissemination of the results.
- Specially funded knowledge transfer projects which aim to "prepare new knowledge from research for practice or for education and counselling"

- The establishment of a generally accessible platform where questions and concerns from the field can be directly brought in and where solutions and support from the research community are needed. The proposed topics could then be reviewed in a coordinated manner in a voting committee, in which practitioners and consultants are represented in addition to those responsible for research, and subsequently dealt with in the form of research projects. This platform would enable more practice-oriented research and a faster transfer of knowledge back into practice.
- The participation of AKIS actors in international innovation projects at the interface between research and practice (e.g. within the framework of the EU Research Framework Programme Horizon 2020 or Europe) is also considered important in the increasingly knowledge-intensive agriculture and forestry. A stronger participation is important for maintaining the competitiveness of Austrian agriculture and forestry. The Chamber of Agriculture has even set up an internal service centre especially for this purpose. Initiatives such as these which lead to a stronger participation of Austrian organisations in the "European AKIS" should be supported and promoted in a targeted manner. Furthermore, the great effort and the risk of success associated with an international project submission could be mitigated by means of start-up financing, seed funding, on the part of the BMLRT, and the innovative power of the domestic AKIS actors and, subsequently, of agriculture and forestry could be strengthened.

## 5.2 Summary and conclusions on sections 4

In agricultural extension services, the Chambers of Agriculture are the first address for most farmers seeking support through extension services and are the backbone of the Austrian AKIS. Furthermore, advisory services are provided by associations. In the field of organic consultancy, the Chambers of Agriculture work together with BIO Austria, the largest Austrian organic association, under the umbrella of ARGE Bioberatung. Private consulting providers are represented in special and niche topics but play a subordinate role in the AKIS as a whole.

The forestry advisory services provided by the Chambers of Agriculture are complemented by offers from the state forestry services, smaller private engineering firms and forestry service organisations as well as the forest

associations (depending on the federal state). In addition to the LFIs, further training for forest owners is provided to a very large extent by the Federal Forest Training Institutes (FAST) and FAST Pichl (part of the LFI Styria).

The FAS is integrated into the broad advisory system of the chambers of agriculture. As a result, advice on cross-compliance is now largely transported through integration with training and advice on other technical farm issues. This approach has proven to be very effective.

Counselling is supported by the public authorities (BMLRT, federal provinces) in several ways: on the one hand, professionally by coordinating strategic management or developing counselling documents and aids; on the other hand, financially by subsidising personnel costs and the further training of counsellors in technical and methodological matters in cooperation with the University of Applied Sciences for Agricultural and Environmental Education and the teaching and research institutions of the BMLRT.

The critical success factors of the Austrian guidance system seem to be the following:

- The broad, comprehensive and cost-effective range of advisory services from a single source or from well-coordinated organisations, which can also efficiently convey cross-cutting issues and topics of public interest (including FAS) and, through interdepartmental networking, can focus on the overall development of the entire agricultural and forestry enterprise
- The close proximity to customers through a close network of regional offices
- The wide variety of methods and the use of methods on specific occasions, from written, telephone and online advice to advice in the office or on site at the agricultural and forestry enterprise
- which through close cooperation with affiliated LFI seamlessly links education, information, counselling
- The system, which has been built up and established over decades and enjoys great trust among farmers and foresters
- Agricultural and forestry consulting services based on professional, methodological and social competence by highly qualified consultants with excellent didactic and technical training

- Continuous improvement and innovative further development of the consulting services and the methods used, ensured by the quality management system and close networking with research
- The wide reach of the advisory services, due to the membership in the Chamber of Commerce, all agricultural and forestry enterprises are reached nationwide with different media and methods.
- The "one-stop-shop" principle in the fields of extension, promotion and training for agricultural and forestry enterprises

The Austrian advisory system, which has been built up over decades and is well established, is also proving its worth in current challenges of agriculture and forestry and should continue to play its strong role in AKIS and as an innovation driver in further development and the sector in the future. In this respect, the broadly based and sufficiently funded promotion of advisory services within the framework of the CAP from 2023 is necessary.

## 6. Acknowledgement of partners, information sources and gaps

This report builds on the contents of the AKIS report 2013. To update the results, a desk study, the evaluation of 6 interviews with experts and the collection of specific feedback from experts, was carried out. The desk study included the review and study of reports, websites and scientific publications (see 7. References) and was carried out in November 2020. In selecting the experts for the interviews and for the specific feedback, it was taken into account that all areas of guidance, education and research in the different organisations were covered in order to capture as many perspectives as possible. The detailed interviews lasted from 30 min to 3 h.

The i2connect online survey was sent to the counselling officers of all 9 federal states at the beginning of November. Due to the homogeneity of the AKIS in the federal provinces, the low response rate (only 3 completely answered surveys, one of which could not be assigned to the Austrian AKIS) had no effect on the preparation of the report. As the education and counselling system and the AKIS is generally lean, well-integrated and evaluated and documented in regular reports, many contents and results of the present report could be derived, for example from the annual education and counselling reports.

The following sources were used for the report

- AKIS Report 2013
- 6 memos from 6 interviews of experts
- Several specific feedbacks from experts
- Several documents and publications
- Websites of the organisations shown

### **Acknowledgement**

We would therefore like to thank in particular the representatives of the following institutions who were available for an interview or for feedback Federal Ministry of Agriculture, Regions and Tourism (BMLRT), the Austrian Chamber of Agriculture (LK Ö), the Chambers of Agriculture of Upper Austria (LK OÖ), the Chamber of Agriculture of Lower Austria (LK NÖ) and the University of Applied Sciences for Agricultural and Environmental Education (HAUP).

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## 8. Appendix

### List and contact of organisations forming AKIS

<b>name of the organisation</b>	<b>website</b>
<b>ministry</b>	
Federal Ministry of Agriculture, Regions and Tourism (BMLRT)	<a href="https://www.bmlrt.gv.at">https://www.bmlrt.gv.at</a>
<b>chambers</b>	
Austrian Chamber of Agriculture Austria (LKÖ)	<a href="https://www.lko.at">https://www.lko.at</a>
regional chambers of agriculture Austria	<a href="https://www.lko.at">https://www.lko.at</a>
Several district chambers of Farmers	<a href="https://www.lko.at">https://www.lko.at</a>
<b>research</b>	
Federal Institute for Agricultural Economics and Mining (AWI and BABF)	<a href="https://bab.gv.at">https://bab.gv.at</a>
Austrian Agency for Food Security (AGES)	<a href="https://www.ages.at">https://www.ages.at</a>
Federal Research Institutes	
Research Institute of Organic Agriculture FiBL	<a href="https://www.fibl.org">https://www.fibl.org</a>
Bio Research Austria	<a href="https://www.bioforschung.at">https://www.bioforschung.at</a>
HBLFA Raumberg Gumpenstein	<a href="https://raumberg-gumpenstein.at">https://raumberg-gumpenstein.at</a>
HBLFA Wieselburg	<a href="https://www.josephinum.at">https://www.josephinum.at</a>
HBLFA Schönbrunn	<a href="https://www.gartenbau.at">https://www.gartenbau.at</a>
HBLFA Klosterneuburg	<a href="http://www.weinobstklosterneuburg.at">http://www.weinobstklosterneuburg.at</a>
Austrian Research Centre for Forests (BFW)	<a href="https://www.bfw.gv.at">https://www.bfw.gv.at</a>
Wood Research Austria	<a href="https://www.holzforschung.at">https://www.holzforschung.at</a>
<b>education</b>	

University college for agrarian and environmental pedagogy (HAUP)	<a href="http://www.haup.ac.at">www.haup.ac.at</a>
agricultural universities of applied sciences (FH)	<a href="https://www.fachhochschulen.ac.at">https://www.fachhochschulen.ac.at</a>
Federal colleges of agriculture and forestry (HBLFA)	<a href="https://www.bmlrt.gv.at/land/land-bbf/bildung-agrar-schulen/unsere-schulen.html">https://www.bmlrt.gv.at/land/land-bbf/bildung-agrar-schulen/unsere-schulen.html</a>
Technical colleges for agriculture and forestry (LFS)	
The agricultural and forestry apprenticeship and technical training centres (Bundes-LFA)	<a href="https://www.lehrlingsstelle.at/bundes-lfa">https://www.lehrlingsstelle.at/bundes-lfa</a>
forestry training centre Pichl and Traunkirchen (FAST)	<a href="https://www.fastpichl.at">https://www.fastpichl.at</a> <a href="https://www.forstfachschole.at">https://www.forstfachschole.at</a>
<b>universities</b>	
University of Natural Resources and Life Sciences (BOKU)	<a href="http://www.boku.ac.at">www.boku.ac.at</a>
Veterinary university of Vienna	<a href="https://www.vetmeduni.ac.at">https://www.vetmeduni.ac.at</a>
<b>further education</b>	
Rural institute for Further Training (LFI)	<a href="https://www.lfi.at">https://www.lfi.at</a>
BIO Austria	<a href="http://www.bio-austria.at">www.bio-austria.at</a>
Austrian Agency for Food Security (AGES)	<a href="https://www.ages.at/">https://www.ages.at/</a>
Technical colleges for agriculture and forestry	<a href="https://www.bmlrt.gv.at/land/land-bbf/bildung-agrar-schulen/agrarfachschole.html">https://www.bmlrt.gv.at/land/land-bbf/bildung-agrar-schulen/agrarfachschole.html</a>
Agricultural Engineering and Rural Development (ÖKL)	<a href="https://oekl.at">https://oekl.at</a>
Rural youth Austria	<a href="https://landjugend.at/">https://landjugend.at/</a>
Sustainable animal husbandry Austria NTÖ	<a href="https://www.nutztier.at">https://www.nutztier.at</a>
LBG Austria	<a href="http://www.lbg.at">www.lbg.at</a>

nature conservation institutions	<a href="https://www.eu-umweltbuero.at/ueberuns/eeb-und-kooperationspartner/umweltorganisationen-oesterreich/">https://www.eu-umweltbuero.at/ueberuns/eeb-und-kooperationspartner/umweltorganisationen-oesterreich/</a>
forest organisations	
forestry training centre Pichl and Traunkirchen (FAST)	<a href="https://www.fastpichl.at">https://www.fastpichl.at</a> <a href="https://www.forstfachschule.at">https://www.forstfachschule.at</a>
<b>Multi actors networks and projects:</b>	
IALB - International Academy of Rural advisors	<a href="https://www.ialb.org">https://www.ialb.org</a>
EUFRAS - European Forum for Rural Adv. Services	<a href="http://www.eufras.eu">www.eufras.eu</a>
Austrian Rural Development Network (NZL)	<a href="http://www.zukunftsraumland.at">www.zukunftsraumland.at</a>
EIP-AGRI Service Point & Operational Groups	
H2020 Multi-Actor projects	
ECO Social Forum	<a href="http://oekosozial.at">oekosozial.at</a>
<b>Producer groups &amp; associations</b>	
Breeding associations	
Federal Association of Sheep and Goats (ÖBSZ)	<a href="https://www.oebisz.at">https://www.oebisz.at</a>
Cattle Breeding Association (ZAR)	<a href="http://www.zar.at">www.zar.at</a>
LKV Austria	<a href="https://lkv.at">https://lkv.at</a>
Association of Austrian Pig Farmers (VÖS)	<a href="https://www.voer-online.at">https://www.voer-online.at</a>
Umbrella organisations for horses and chicken	<a href="https://www.nutztier.at">https://www.nutztier.at</a>
bee austria	<a href="https://www.biene-oesterreich.at">https://www.biene-oesterreich.at</a>
<b>Associations, media</b>	
Rural youth Austria	<a href="https://landjugend.at/">https://landjugend.at/</a>
AIZ Info	<a href="https://aiz.info">https://aiz.info</a>

Agrarnet Austria	
ARGE Austrian Farmers' Women (Seminar farmers women in Austria, School on the farm)	<a href="https://www.baeuerinnen.at">https://www.baeuerinnen.at</a>
Machinery Ring (MR)	<a href="https://www.maschinenring.at/maschinenring-oesterreich">https://www.maschinenring.at/maschinenring-oesterreich</a>
Graduate associations of agricultural schools	
Agricultural media/lk-online	<a href="https://www.lko.at/startseite+2500+++2000">https://www.lko.at/startseite+2500+++2000</a>
Forest associations	
agriculture and forestry	
<b>paying agency</b>	
AMA Marketing	<a href="https://www.ama.at/">https://www.ama.at/</a>
Agricultural market Austria	<a href="https://www.ama.at/">https://www.ama.at/</a>
<b>charities</b>	
LQB	<a href="https://www.lebensqualitaet-bauernhof.at">https://www.lebensqualitaet-bauernhof.at</a>
SVS	<a href="https://www.svs.at">https://www.svs.at</a>
<b>NGOs</b>	
e.g. Bird life	<a href="http://aktivwerden.at/liste.php">http://aktivwerden.at/liste.php</a>
<b>Consumer information platforms</b>	
e.g. living landscape	<a href="https://www.landschafttleben.at">https://www.landschafttleben.at</a>
<b>Input traders</b>	
<b>Independent consultants</b>	
Private consultans	
Veterinarians	<a href="https://www.veterinaere.at">https://www.veterinaere.at</a>

# AKIS and advisory services in *Belgium*

## Report for the AKIS inventory (Task 1.2) of the i2connect project

*Date: November, 2020*

**Authors:**

Charlotte, Lybaert  
Lies, Debruyne

Contact: [charlotte.lybaert@ilvo.vlaanderen.be](mailto:charlotte.lybaert@ilvo.vlaanderen.be)

Project funded under the Horizon 2020 Research and Innovation Programme under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION' HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

The aim of this report is to provide an overview of the Belgian Agricultural Knowledge and Innovation Systems (AKIS), with a main focus on advisory services, and was created in the context of the Horizon 2020 project i2connect (connecting advisors to boost interactive innovation in agriculture and forestry). It covers the main changes in public policy with an effect on advisory services over the past decade, public policy regarding agriculture, public funding, advisory methods and significant actors in the network, as well as a section on the Farm Advisory System (FAS).

Belgium is a relatively small country, characterised by a complex political organisation in which the regions have a lot of responsibility. Because of this decentralisation, Belgium can be perceived to have two separate AKIS, one in Flanders and one in Wallonia. Both AKIS are constituted by a large variety of actors, each having their own area of expertise. Both regions chose to implement a public policy characterised by a delegation of services, in which the Flemish and Walloon governments support both AKIS' with institutional support and competitive calls. Over the past years, the main changes in public policy that had an influence on agricultural advisory services in Belgium were the implementation of the KRATOS system in Flanders and the installation of the Walloon Code of Agriculture.

In Flanders, the AKIS is centred around the experimental stations who provide a link between applied research and the production sector and the farmers' unions. There are many other organisations and institutions that all are interlinked to some degree, which is why the Flemish AKIS can be considered as strong and integrated. The weakest issue of the Flemish AKIS appears to be the advisory system which still has a weak link to agricultural research. Advisory services in Flanders mostly operate on a regional scale. With regard to topics for advice, economic and business advice (entrepreneurship, farm management, accounting/bookkeeping) still appear to be the most popular ones among the Flemish agricultural community. However, a growing interest for agri-environmental stewardship measures and nature conservation can be perceived. Looking at these measures it becomes apparent that innovation is a key aspect of the Flemish agricultural policy and support measures. The best examples are the

RDP measure M04 support for innovation projects in agriculture and support for the creation and activities of the EIP operational groups (RDP measure M16). Furthermore, The Flemish agency for Innovation and Entrepreneurship also supports projects related to agriculture with an economic objective or innovative strategy.

In Wallonia, the pilot centres, the *Collège des producteurs* and a large range of other organisations and institutions form the backbone of the AKIS. Wallonia has a lot of resources in terms of knowledge exchange and support services for farmers but because of the plurality of these service providers it is hard to find an overview of the specific expertise of each actor. Because of the lack of coherence and resonance between the different Walloon AKIS organisations, the Walloon AKIS can be considered as strong but rather fragmented. Advisory services in Wallonia also appear to operate on a regional scale and seem to spend slightly more time on teaching and training activities and participating in training programs than their Flemish counterparts. In Wallonia, the topics 'production technologies' and 'entrepreneurship and farm management' appear to be the most popular ones among the Walloon agricultural community. The Walloon government also supports agriculture through an array of support measures, however, they seem less focused on innovation than is the case in Flanders. The FAS in Wallonia is implemented as the *Système de conseil agricole*. For both regions it appears to be difficult to measure the impact of the FAS as well as of other agricultural support measures. This could be due to a lack of guidelines regarding impact indicators coming from the European Commission.

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## Abbreviations

ABS	Algemeen Boerensyndicaat
AKIS	Agricultural Knowledge and Innovation Systems
ANB	Agentschap Natuur en Bos (Agency for Nature and Forests)
Apaq-W	l'Agence Wallonne pour la promotion d'une agriculture de qualité
ASIDA	Aides au développement et à installation dans le secteur agricole
BAS	Bedrijfsadviessysteem
CCSRA	Comité de concertation et de suivi de la recherche agronomique
COSTAGRI	Comité stratégique de l'agriculture
CRA-W	Centre de Recherches Agronomique de Wallonie (the Walloon Agricultural Research Centre)
CRE	Centre Regional de Référence d'Experimentation
DNF	Département de la Nature et des Forêts (the Department for Nature and Forests)
FAS	Farm Advisory Service
FHW	Fédération Horticole Wallonne
FJA	Fédération des Jeunes Agriculteurs
FUGEA	Fédération Unie de Groupements d'Eleveurs et d'Agriculteurs
FWA	Fédération Wallonne de L'Agriculture
FWO	Fonds voor Wetenschappelijk Onderzoek
ILVO	Instituut voor Landbouw, Visserij en Voedingsonderzoek (Research institute for agriculture, fisheries and food)
INBO	Instituut voor Natuur- en Bosonderzoek (Research Institute Nature and Forest)
KU Leuven	Katholieke Universiteit Leuven
L'AWAF	L'Association pour la promotion de l'agroforestry en Wallonie et à Bruxelles
RDP	Rural Development Programme
RN	Rural Network
SPW ARNE	Service Public de Wallonie, Agriculture, Ressources naturelles et Environnement
SPW EER	Service Public de Wallonie, Economie, Emploi, Recherche
UAW	Union des Agricultrices Wallonnes
Ugent	Universiteit Gent (Ghent University)
UNAB	Union Nationale des Agrobiologistes Belges
VAC	Vlaams Agrarisch centrum



VLAIO	Agentschap Innoveren & Ondernemen (Flemish Agency for Innovation and Entrepreneurship)
VLIF	Vlaams Landbouwinvesteringsfonds

## 1. Main structural characteristics of the agricultural and forestry sector

### Introduction to Belgium

The kingdom of Belgium is divided into three autonomous regions, the Flemish region in the North of the country, Wallonia in the South and the smaller Brussels-Capital region. Belgium is also divided into three linguistic groups or communities: the two main communities are the Dutch-speaking community (mainly in Flanders) and the French-speaking community (mainly in Wallonia). There is also a smaller German-speaking community in the East-Cantons. The Capital of Brussels is officially bilingual (French and Dutch).

The total population of Belgium consisted of 11.431.406 people on January 1st 2019; 57,6% of this population lived in Flanders, 31,8% in Wallonia and 10,6% in the Brussels-Capital region (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019a). The total area of land is 30.668 km<sup>2</sup> of which 44,4% comprises the area of Flanders and 55,1% comprises the area of Wallonia (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019a). Land use in Belgium is divided as follows: 44% of the total Belgian area of land is agricultural area, 20% is forested area, 21% built environment, 1% water surface, 14% miscellaneous (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019a). The portion 'built environment' has been expanding year after year, mainly at the expense of agricultural area (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019b).

The Belgian GDP was 450,5 billion euro in 2018. Belgium comprises 2,2% of the total European population, the Belgian GDP at market prices amounts to 2,8% of that of the European union (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019a).

### The Agricultural sector in Belgium

In 2019, the total utilized agricultural (UAA) area in Belgium comprised 1.358.705 ha (621.702 ha in Flanders and 733.715 ha in Wallonia) (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019b). In 2018, 6,56% of the total UAA was under organic farming, comprising 76.532 ha (Eurostat - European Commission, n.d.). In 2019, the agricultural sector in Belgium consisted of 36.111

agricultural holdings; of these 23.318 were Flemish holdings and 12.733 were Walloon (Statbel (Algemene Directie Statistiek - Statistics Belgium), n.d.). The Belgian agricultural sector is characterised by a structural decrease in the number of agricultural holdings and the related increased concentration of agricultural land and production methods (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019b). Between 1980 and 2018, 68% of the Belgian agricultural holdings disappeared, both in the Flemish and Walloon region at approx. the same pace (approx. -2,5% per year) (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019b). However, during this time, the average farm area almost tripled in size: in Flanders the average UAA per holding rose from 8,4 ha in 1980 to 26,6 in 2018, in Wallonia in the same period, the UAA per holding rose from 20,7 ha to 57,6 ha (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019b).

Employment in the agricultural sector is also decreasing: 62% of the jobs in the agricultural sector disappeared between 1980 and 2016; this reduction is partly due to the reduction in the amount of farms, but also partly due to intensification of mechanisation in agriculture (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019b). Only a small portion of the Belgian labour force is active in agriculture: in 2019, only 0,96% of the employees in Belgium were active in the agricultural sector (Statista, 2020). Over the past years, a dual evolution can be seen: on the one hand there has been a slight rise in the amount of workers per holding (from 1,63 workers in 1980 to 1,92 workers in 2016); on the other hand, there has been a rise in the share of non-family labour (from 3,9% in 1980 to 27,9% in 2016) (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019b). The economic contribution of the agricultural sector to the Belgian economy has decreased systematically from 1,13% in 1980 to merely 0,63% in 2018 (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019b). This is, however, not the case for export of the agricultural industry, which accounts for 5,3% of the total Belgian export (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019b). Furthermore, the agri-food sector takes second place in the Belgian industry with a share of 14,6% (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019b).

The use of agricultural land in Belgium in 2018 was spread as follows: 35,4% permanent grassland, 22,5% cereals, 21,2% fodder crops, 7,5% industrial crops, 6,9% potatoes, 3,7% vegetables (in open air), 1,7% perennial crops, 0,7% fallow land, 0,5% others (Statbel (Algemene Directie Statistiek - Statistics Belgium), 2019b). Livestock density in Belgium was 2,79 livestock units/ha in 2016 (Eurostat

- European Commission, n.d.). In 2019, the distribution of livestock was as follows: 2.373.102 cattle, 537.960 dairy cows, 6.085.101 pigs, 49.808.225 poultry (Statbel (Algemene Directie Statistiek - Statistics Belgium), n.d.). Table 1 gives an overview of the production of the main crops, milk and meat in Belgium, in 2018 (Eurostat - European Commission, n.d.). In 2019, crop output at basic and producer prices was 3.802,34 million EUR and the animal output at basic and producer prices 4.809,79 million EUR (Eurostat - European Commission, n.d.). The gross value added of the agricultural sector at basic and producer prices was 2.279,33 million EUR.

*Table 1: Production of main crops in Belgium in 2018 (tonnes).*

Production of cereals	2.483.008
Production of potatoes	3.045.443
Production of sugar beets	5.192.049
Production of rapeseed	42.834
Production of fodder	6.485.322
Collection of cow's milk	4.178.890
Production of meat: pig	1.038.920
Production of meat: cattle	263.750
Production of meat: sheep and goats	3.010
Production of meat: poultry	447.790

Source: Eurostat - European Commission (n.d.)

### **The Forestry sector in Belgium**

The total forested area in Belgium comprised 706.530 ha in 2019, of which 148.621 ha was in Flanders and 557.909 ha in Wallonia (Office Économique Wallon du Bois, 2019). The gross value added of the forestry industry, at basic prices, was 82,7 million ECU/EUR in 2017 (Eurostat - European Commission, n.d.). In 2011, round wood production in Belgium was 5.128.000 m<sup>3</sup>, total sawn wood production 1.387.500 m<sup>3</sup> and total paper and paper board production 2.039.910 tonnes (Eurostat - European Commission, n.d.). The forestry sector in Belgium employed 53.274 people in 2018, of which 39.465 in Flanders, 11.922 in Wallonia and 1.887 in Brussels (Office Économique Wallon du Bois, 2019). Table 2 gives an overview of the distribution of these numbers per category of activity.

*Table 2: Employment in the forestry sector in Belgium in 2018*

<b>Category of activity</b>	<b>Wallonia</b>	<b>Brussels</b>	<b>Flanders</b>	<b>Belgium</b>
Forestry and logging	482	5	232	719
Wood working	2.513	254	6.718	9.485
Paper and paperboard	1.324	0	1.518	2.842
Furniture	1.365	95	7.472	8.932
Carpentry	3.501	524	11.962	15.987
Wholesale trade	810	72	2.803	3.686
Retail trade	1.878	929	8.568	11.375
Divers	48	8	193	249
<b>Total</b>	<b>11.922</b>	<b>1.887</b>	<b>39.465</b>	<b>53.274</b>

Source: Office Économique Wallon du Bois (2019)

## 2. Characteristics of AKIS

### 2.1. AKIS description

Since the main characteristic of the Belgian AKIS is its decentralisation, we propose to make two separate AKIS diagrams for Flanders and Wallonia, analogous to the first AKIS diagrams and country report for Belgium, constructed in the PROAKIS project (Labarthe & Moumouni, 2014).

#### 2.1.1. AKIS actors and knowledge flows

##### **Flanders**

###### *Universities and institutions for higher education*

In Flanders, two universities are involved in agricultural research and education, namely Ghent University (Ugent) and *Katholieke Universiteit Leuven* (KU Leuven). Furthermore, there are three institutes for higher education which provide courses in agriculture and agro- and biotechnology: Hogent, Thomas More and Odisee. These institutes for higher education also play an important role in practical agricultural research, and as such are more closely connected to farmers, which is less the case for the universities.

###### *Research institutions*

There is one major applied research institute for agriculture in Flanders: the research institute for agriculture, fisheries and food (*Instituut voor Landbouw-, Visserij- en Voedingsonderzoek*, ILVO). ILVO performs multidisciplinary, independent research aimed at economically, ecologically and socially sustainable agriculture and fisheries. ILVO is organised into four research departments: animal science, plant science, technology and food science and social science. Each unit is further subdivided into different research areas. More info on ILVO is provided in section 4. Furthermore there are several private research institutions. For example VITO, an independent Flemish research organisation conducting research in the area of cleantech and sustainable development.

###### *Experimental stations*

The experimental stations (*proefcentra* or *praktijkcentra*) form a key element in the Flemish AKIS., and are responsible for bridging the gap between research and practice. In total there are 12 experimental stations for crop production and 5 for animal production. The experimental stations for crop production have existed for years and form a vital link between applied research and the production sector as they translate existing knowledge in feasible solutions in a neutral manner. For

this, they are supported by the Flemish Government by an operating grant. Some experimental stations for crop production also function as an advisory service. The experimental stations for animal production have existed since 2007 and are collaborations rather than physical institutions. Their goal is to form a point of contact for practical knowledge and the implementation of this knowledge in the animal sector. More info on the experimental stations is provided in section 4.

#### *Farmers' unions*

There are four main farmer' associations in Flanders: *Boerenbond*, *Bioforum* (for organic farming), and *Algemeen Boerensyndicaat* (ABS). These associations provide several advice and support services to farmers. The largest of the three associations is *Boerenbond*. *Boerenbond* includes a number of subsidiaries, such as *BB Consult vzw* (their advisory service), *Innovatiesteunpunt* (information and counselling on agriculture and rural development), *Arvesta* (the largest full-service partner for Belgian farmers), etc. In addition, there is also the association *Vlaams Agrarisch Centrum* (VAC), this smaller association is not unimportant in terms of knowledge exchange as they frequently organise training activities. More info on the farmers' unions is provided in section 4.

#### *Bookkeeping companies and private consultants*

In Flanders, a wide range of organisations specialising in the delivery of agricultural advice can be found. Most of these organisations are private companies although many farmers' associations, experimental stations and other AKIS actors also provide advisory services. More info can be found in section 4.

#### *Cooperatives & auctions, suppliers, agro-food firms and banks*

Many upstream and downstream organisations, such as companies that supply farmers with animal feed, seeds, fertilizers, etc. also form a valuable source of information to many farmers, mostly on technical issues. They often have trusting relationships with farmers. Veterinarians also fall into this category. Furthermore, peer-to-peer knowledge exchange among farmers is another source of information that cannot be underestimated.

#### *Education*

Apart from the universities and institutes for higher education, which provide bachelor, master and phd degrees, there are several schools for secondary education that are focussed on agriculture. There are also several approved centres for agricultural training and refresher courses. There are four general centres: *Agrocampus vzw*, *Nationaal Agrarisch Centrum*, *Praktijkcentrum voor land- en tuinbouw* and *Landwijzer vzw*, and 27 regional ones. These centres also provide basic courses for starting farmers who did not have a full-time education in farming (in order to be eligible for start-up aid (vestigingssteun), farmers have to demonstrate professional competence).

## **Wallonia**

### *Universities and institutions for higher education*

There are three universities that provide master degrees related to agriculture: *Université de Liège*, *Gembloux Agro-Bio Tech* and *Université Catholique de Louvain*. Furthermore, there are five institutions for higher education providing bachelor degrees in Agriculture (Ba Agronomie): *Haute Ecole Provinciale de Hainaut*, *Haute Ecole de la province de Namur*, *Haute Ecole de la province de Liège*, *Haute Ecole Charlemagne*, *Haute Ecole Louvain en Hainaut*. These institutions are also involved in agricultural research.

### *Research institutions*

As is the case in Flanders, there is one major applied research institute on agriculture in Wallonia: the Walloon Agricultural Research Centre (*Centre de Recherches Agronomiques de Wallonie*, CRA-W). The working of CRA-W is structured into four main research domains: precision agriculture, precision livestock farming, risk management and understanding products. CRA-W also assists the Walloon government in defining and implementing an agricultural research policy. More info on CRA-W is provided in section 4. Furthermore, Wallonia has several private research institutions, e.g. the CER group, which has experience in the fields of biomedical research, the food industry and agricultural training.

### *Pilot Centres*

Analogous to the experimental stations on crop production in Flanders, Wallonia has eleven approved Pilot centres (*Centres Pilotes*). They represent a certain production sector or particular theme and coordinate activities regarding that sector/theme. Furthermore they perform practical experiments and organise demonstrations. More info on the pilot centres is provided in section 4.

### *Collège des Producteurs*

The *Collège des Producteurs* is an organisation consisting of different producer groups, representing different agricultural sectors or themes. The *Collège des Producteurs* forms a link between the producers, the public authorities and several other players linked to the respective sector or theme. More info on the *Collège des Producteurs* is provided in section 4.

### *Farmers' unions, non-profit associations, private research institutes and Comices agricoles*

In Wallonia, a wide array of different organisations and actors exist, who provide advice, research or some form of support to farmers. Amongst them are the farmers' unions of which the *Fédération Wallonne de L'Agriculture* (FWA) is the

largest. More info on variety of agricultural organisations in Wallonia is provided in section 4.

*Bookkeeping companies and private consultants*

As is the case in Flanders, there is a range of organisations specialising in the delivery of agricultural advisory services. These organisations are private companies, farmers' associations, etc. There is some overlap with the organisations mentioned in the previous paragraph and more info is also provided in section 4.

*Input traders, agro-food firms, banks and cooperatives*

Similar to the situation in Flanders, upstream and downstream organisations and private companies form a significant source of information for many farmers. As is probably the case in many AKIS, peer-to-peer knowledge exchange amongst farmers is also of vital importance.

*Education*

Agricultural education in Wallonia falls under the responsibility of the Wallonia-Brussels Federation. Technical education exists in different study programmes: secondary education (*Écoles d'agriculture techniques et professionnelles*), which takes 6 years starting from the age of 12; bachelor degrees in the institutions for higher education (*Écoles Supérieures d'Agronomie*) and bachelor-, master- and PhD degrees in the universities. There are also opportunities to enter the university through a transition programme or training sessions accredited by the government. Furthermore, Wallonia partners up with several vocational training centres (*centres de formation professionnelles*) to offer courses and on-farm training to people who wish to develop professional activities in the agricultural sector. The courses and internships are aimed in particular at people who have not followed an agricultural education, however they are also available to workers in the sector to deepen or update their knowledge. The courses also provide access to the conditions required to benefit from financial aid granted by Wallonia. Farmers who want to apply for subsidies are required to take part in a three month internship before setting up their business.

## **2.1.2. Policy framework at regional level and coordination structures**

### **Flanders**

The main entity for agricultural policy making in Flanders is the Department of Agriculture and Fisheries (*Departement Landbouw en Visserij*). Together with the

minister for agriculture, they design the policy for agriculture, horticulture, fisheries and the rural areas. The Department implements the policy, controls and evaluates it. Furthermore, the department manages the Rural Development Programme (RDP) budget and thus provides funding for training activities, demonstration projects, agricultural advice, support for innovation, etc. This funding is provided through the means of competitive calls, aimed at individual farmers, organisations, farmers' unions, etc. More info on Flemish support measures for agriculture is provided in section 4.

Apart from competitive calls, the Flemish government provides institutional support to several organisations, of which ILVO is the main beneficiary. ILVO receives an annual basic subsidy from the Flemish Government which covers a foundational stipend for operations and also pays the wages of statutory and government-contract ILVO staff. The experimental stations for crop production also receive an operational grant. This subsidy can account from 3% up to 10% of the total working budget of an experimental station, depending on the amount of their other sources of income. Apart from the operating grant (*werkingssubsidie*), issued by the Flemish Government, the experimental stations receive funding either from the province they are located in (e.g. the experimental station *Inagro* vzw, who is linked to the province West-Flanders) or from one of the cooperatives or auctions (e.g. *proefcentrum Hoogstraten* results from the cooperative *Hoogstraten*). As mentioned in the previous section, the experimental stations for animal production are networks composed of institutions such as research institutions, experimental station (crops), farmers' unions, etc. and do not receive an operational grant from the Flemish Government. The individual institutions can however apply for a support subsidy (*steun aan de omkaderingssector*). This subsidy is meant for investments in the context of practical research. The government sends out an annual call amounting to approx. 3-4 million euros. To be able to apply, the institution has to be accredited by the Flemish Government. This support subsidy is part of the VLIF program, which is discussed in section 4.

Also contributing to the Flemish AKIS is the Department of Economy, Science and Innovation of the Flemish Government, as they can provide funding for projects related to innovation and the Department of Environment and Spatial Development which is frequently involved in projects aimed at the agricultural community (e.g. LEADER).

Another part of the Flemish Government is the Flemish Rural Network (RN). Their main purpose is communication about the different Flemish RDP measures and their activities. Furthermore they will organise events and seminars linked to RDP funded activities (e.g. a seminar regarding EIP operational groups).

## **Wallonia**

Agricultural policy making in Wallonia falls under the responsibility of the Walloon government. The regional administration offices involved in implementing the agricultural policy are *Service Public de Wallonie, Agriculture, Ressource naturelles et Environnement* (SPW ARNE) and *Service Public de Wallonie, Economie, Emploi, Recherche* (SPW EER). SPW ARNE is the department on agriculture, natural resources and environment. The administrative department of SPW ARNE regarding agriculture is the Department of Agriculture (*Département de l'Agriculture*). The Department of Agriculture contributes to the payment of regional and European agricultural aid. It carries out the functions of instruction and file ordering. It monitors European investigations in the management control of European funds. SPW EER is the department on economy, employment and research. These two departments are linked with regard to agricultural training: SPW EER deals with the approval procedure of the vocational training centres for agricultural technical courses, agricultural management and economics courses, advanced courses and internships on farms. SPW ARNE is aware of the needs of the agricultural sector and takes care of further training (it can therefore supplement the above courses). The topics of the education courses are determined by the minister on the basis of a call for projects.

SPW ARNE and SPW EER are also united within the framework of agricultural research projects. The SPW EER coordinates, develops and manages regional, federal and international research programmes on a wide range of topics. The SPW ARNE coordinates all research in the agricultural and environmental innovation sector. There are therefore common interests (project evaluation and rating system, appointment of foreign experts, cross-referencing of files for common themes, etc.).

As in Flanders, the Walloon government offers financial support related to agriculture in the form of institutional support and competitive calls. The main actors receiving institutional support are CRA-W, the Collège des producteurs, the Centres Pilotes and the farmers' unions. These structures and organisations of the

Walloon AKIS are mainly subsidised via ministerial orders or orders of the Walloon Government. They must propose a work programme and a budget estimate at the beginning of the project before the ministerial orders are signed. The evaluation of their activities is done through the approval of an activity report by a monitoring committee (chaired by the minister's office or his representative or by the administration).

The administration also launches competitive calls for themes set by the minister within the framework of research and development projects. Furthermore, the Walloon government appointed a Walloon rural network (*Réseau wallon de Développement Rural*). Contrary to the Flemish rural network, the Walloon rural network is not part of the Walloon government but is outsourced to an external organisation. It is assigned to implement and handle communication about the Walloon RDP measures.

## 2.2. Forestry in the Flemish and Walloon AKIS

Flanders is characterised by a very small forested area. Consequently, not much commercial forestry activities are being conducted there. What forested areas are left are mainly reserved for nature conservation purposes. Nature conservation falls under the Environment policy area of the Flemish government. There are two important institutes of the Flemish government regarding forestry (nature conservation) in Flanders. The first is the Agency for Nature and Forests (*Agentschap voor Natuur en Bos*, ANB), which is responsible for policy regarding nature and sustainable management of Flanders' natural resources. The second is the Research Institute for Nature and Forest (*Instituut voor Natuur- en Bosonderzoek*, INBO), which is the Flemish research and knowledge centre for nature and its sustainable management. It carries out research and provides knowledge to those who prepare and implement policy regarding the natural environment. INBO works primarily for the Flemish government, but it also provides information for international reporting and responds to questions from local authorities. It supports nature management, forestry, agriculture, hunting and fishing organisations. Commercial forestry on the other hand, like agriculture, falls under the Agriculture and Fisheries policy area of which the administrative unit is the Department for Agriculture and Fisheries. Commercial forestry (tree nurseries, control of forest reproductive material, etc.) is seen as horticulture and therefore these foresters can make use of the same support measures existing for agriculture, e.g. the VLIF support program.

Wallonia has more forested area than Flanders. Forestry in Wallonia falls under the responsibility of SPW ARNE. Similar as the situation in Flanders, a difference can be seen between forestry for nature conservation purposes and commercial forestry. The first falls under the administrative responsibility of the Department for Nature and Forests (*Département de la Nature et des Forêts*, DNF) of SPW ARNE. The DNF develops, implements and monitors policies and regulations on forests, nature conservation, nature parks, hunting and fishing, it monitors compliance with these policies and regulations and it manages public forests and state nature reserves. In terms of green spaces, it supports the municipalities in their development and manages state parks. Commercial forestry, like agriculture, falls under the responsibility of the Department of Agriculture (*Département de L'Agriculture*) of SPW ARNE.

In both regions, agroforestry is making a slow but steady rise. In Wallonia the organisation L'AWAF (*L'Association pour la promotion de l'agroforestry en Wallonie et à Bruxelles*) is a non-profit organisation that aims to promote agroforestry through visits, exchanges, working groups, development projects and conferences. In Flanders, the website [www.agroforestryvlaanderen.be](http://www.agroforestryvlaanderen.be) provides information on agroforestry. It is a project funded by the Flemish Agency for Innovation and Entrepreneurship (*Agentschap Innoveren en Ondernemen*, VLAIO) between partners ILVO, *Inagro* vzw (experimental station), UGent, Soil service of Belgium and the non-profit organisation *Boerennatuur Vlaanderen* (previously *Agrobeheercentrum Eco<sup>2</sup>*). Its goals are to map out possibilities for different forms of agroforestry in Flanders, increase knowledge on ecological interactions as well as economic opportunities and to offer guidelines and recommendation to farms regarding the application of agroforestry.

### 2.3. AKIS diagrams

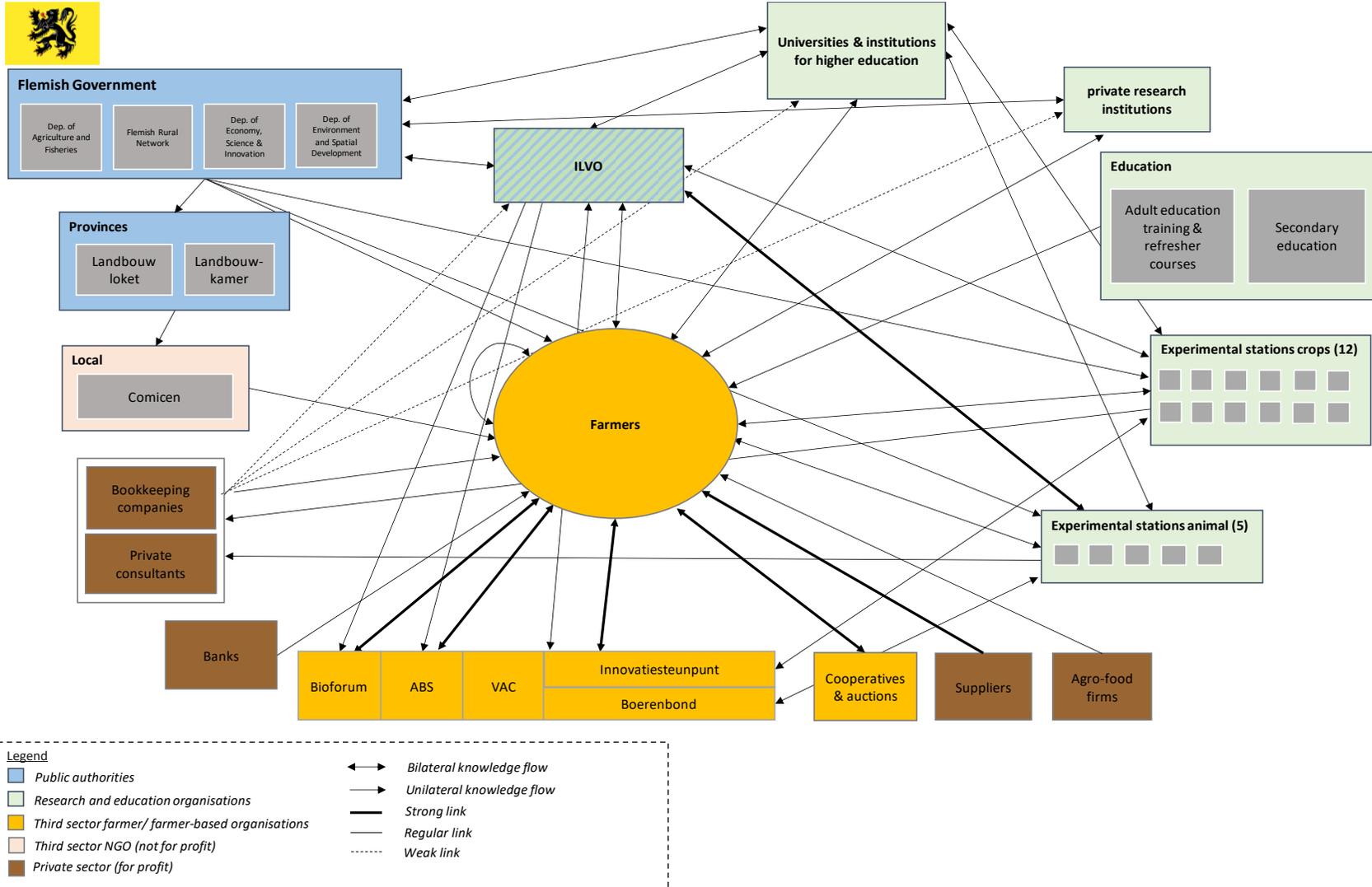


Figure 1: The Flemish AKIS diagram

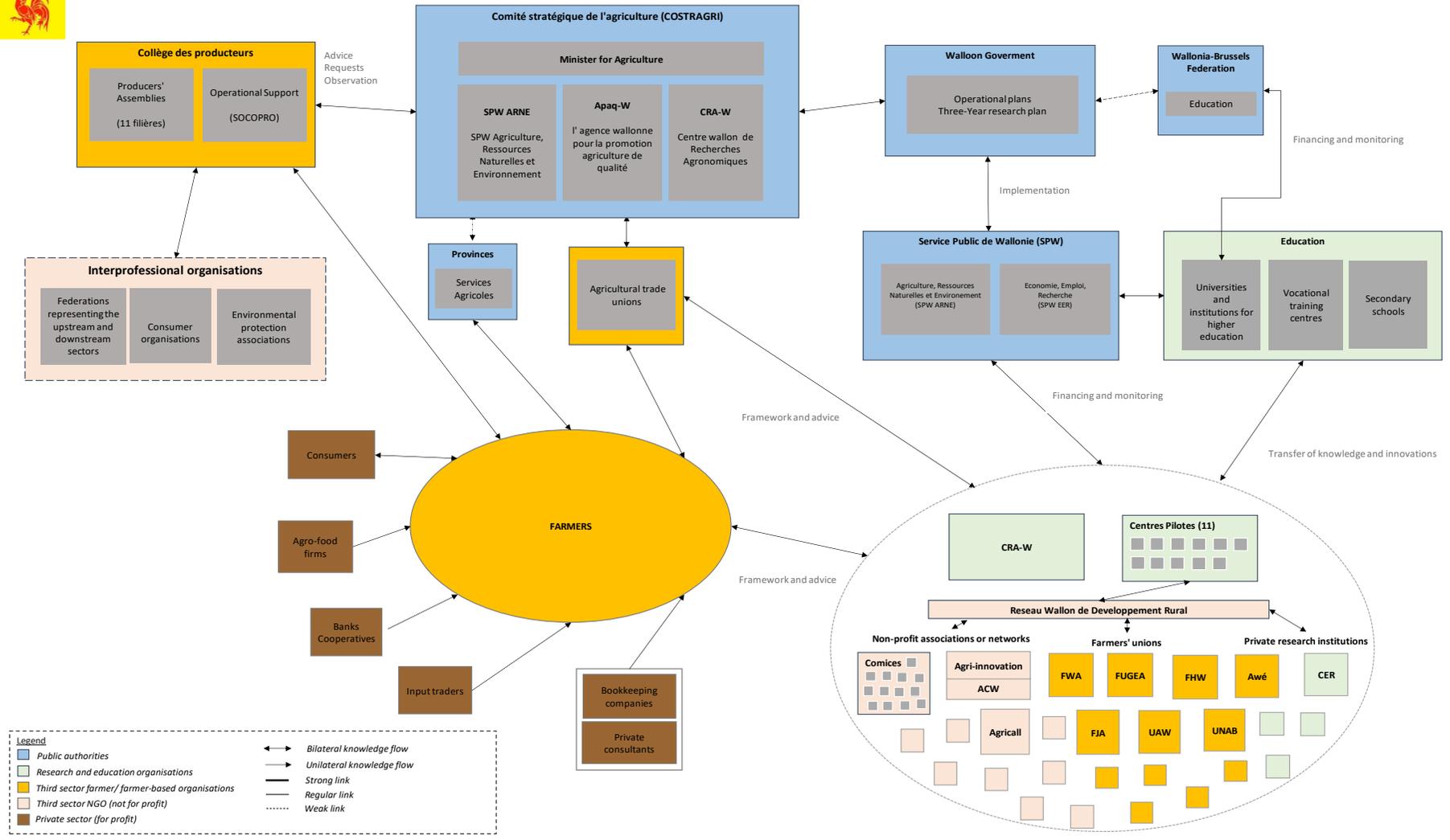


Figure 2: The Walloon AKIS diagram

### 3. History of the advisory system

For the history of the advisory service in Belgium before 2010 we refer to the country report for Belgium, which was made in the PROAKIS project by Labarthe & Moumouni (2014). This section highlights changes made since that time.

#### **Flanders**

The biggest change in advisory services in Flanders over the past years has been the transformation of the 'BAS' (*bedrijfsadviessysteem* which can be translated as 'business advisory system') into 'KRATOS'. During the second programming period of the rural development program (RDP), which covered the period 2007-2013, European financial aid was granted to farmers, wishing to request advice, under the BAS-system, which was at the time also the Flemish instalment of the European requirement of creating a Farm Advisory System (FAS). The BAS-system was popular, however the Flemish officials noticed a great need for advice on many topics among the agricultural community which were absent in BAS. For RDP III (2014-2020), it was therefore decided to create another advisory instrument for farmers, which resulted in the development of KRATOS (measure M02 of RDP III). KRATOS differs greatly from its predecessor BAS. During RDP II, any advisory service that met the preconditions could apply for approval for BAS via a legal framework. However, the new Rural Regulation required that the set-up of a farm advisory system with RDP support must be done through national public procurement legislation. In the case of KRATOS, one or more services may therefore be selected per module and, consequently, the selection of farm advisory services may vary throughout RDPD III as several public tenders are launched during the lifetime of RDP III. Flemish officials claim that this system of selecting advisors through public procurement is not efficient as it brings a large administrative burden that takes up 6 months (during which the farmers also cannot request any advice), for a selection period of 2 years. The selection via public procurement was an obligation of the European Commission at the start of RDP III, however, this obligation was omitted in a later phase. Since the system of working via a public procurement was already put into practice, the Department decided to continue to work in this way. For the next CAP programming period, the Department of Agriculture and Fisheries plans to select the advisory services without the use of public procurement. More information on the content of the

KRATOS modules is provided in section 4. Table 3 illustrates the difference between the BAS-system and the KRATOS-system.

*Table 3: Differences in advisory system provided in RDP II compared to the one provided in RDP III.*

<b>RDP II: BAS</b>	<b>RDP III: KRATOS</b>
Selection of advisory services through an approval procedure described in Flemish legislation	Selection of advisory services through public procurement
1 advice includes 5 mandatory modules	1 advice = 1 module. Each farmer can request advice on 9 different modules
Farmer has to pre-finance advice and receives a grant for part of the consultancy fee it after approval of his file. (max. 80% and max. 1500 euro)	Advice is completely free of charge. Farmers should not pre-finance anything. The Flemish government directly pays the advisory service for the given advice.
5 modules	9 modules (see Annex 3), creating a whole series of new topics covered in comparison with BAS.

## **Wallonia**

The main change in Wallonia which concerned agricultural advisory services was the instalment of the Code wallon de L'Agriculture or the Walloon code of agriculture in 2014. The Code defines a vision on agriculture and its roles in society, guides policies, regulations and aids towards this vision and facilitates the understanding of regulations by grouping them together in a single code.

This Walloon Code of Agriculture gives Walloon farmers the means to improve their income, quality of life and working conditions. It also enables citizens to benefit from agriculture that provides quality products. Finally, it encourages the introduction of agriculture that respects the environment and its biodiversity.

The Walloon Agriculture Code and its legal tools have also made it possible to adopt a set of decrees that make the most of the opportunities offered by the European Union in the latest reform of the CAP. Today, all agricultural initiatives in the Walloon region find their source in the Walloon code of agriculture.

## 4. The agricultural and forestry advisory service(s)

In both regions a wide array of organisations provide advice and other services to farmers and play an important role in knowledge exchange. It is not possible to provide an exhaustive list of organisations as they are too numerous, however in the next section we wish to highlight and provide more in-depth info on several important actors in the Flemish and Walloon agricultural knowledge and innovation systems. Information in this section is in part based on a survey that was sent out to advisory organisations. The survey was opened for 4 weeks, and during that time a total of 32 survey answers was collected (16 for Flanders, 16 for Wallonia). The link to the survey was spread by email to 109 organisations in total, giving a response rate of 29,4%. When it comes to representativeness of the survey results for the advisory landscape in Belgium, we see that a mix of different organisations have completed the survey, covering the whole territory. An overview of the different respondent categories, and their distribution for Flanders and Wallonia is shown in Figure 3. Several organisations indicated as belonging to different categories, which is related to them receiving funding through different channels. We can see that for Flanders we had a higher response rate from private/commercial advisory companies and freelance advisors. However, we do not see this as representative for the difference between the two regions. As described under 4.1, in both regions there is a mix of public, research-based, farmer-based, non-governmental and private organisations.

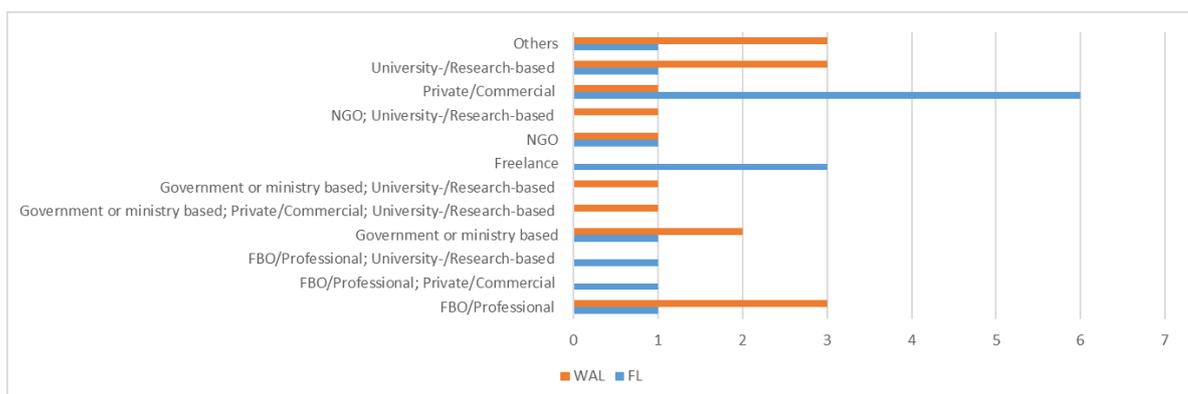


Figure 3: Overview of the survey respondent categories for Flanders and Wallonia. FBO: farmer based organisation; NGO: non-governmental organisation

For Flanders, respondents indicated mostly working on a regional scale, which is not surprising considering the political structure of Belgium. However, 6/13 organisations also indicated operating (inter)nationally. All Walloon advisory

organisations indicated working on a regional scale, except for one organisation operating on a national scale.

## 4.1. Overview of all service suppliers

### Flanders

As a Flemish scientific institution, **ILVO** receives a basic subsidy from the Flemish Government's Agriculture and Fisheries policy area. Further ILVO has its 'Own Capital' fund ('EV-ILVO'), consisting of project and contract research funds, and generated by sales of research-related services and products. ILVO employs over 600 people, some directly through statutory assignments or contracts with the Flemish Government. Others are funded through projects, contracts and ILVO's 'Own Capital' funds. ILVO has approx. 200 ha of experimental fields, 15.000 m<sup>2</sup> of greenhouses and more than 20.000 m<sup>2</sup> of experimental animal housing. It contains various labs for analysis and detection, a diagnostic centre for plants and accredited laboratories for plants, feed, spraying techniques, food and GMO's. Furthermore, ILVO has test benches, an experimental dairy facility, a pilot plant and a seed processing unit. Apart from its research activities, ILVO provides lab analyses (food-related, plant, soil and substrate, animal-related and marine-related analyses) to industry, producers and the government. ILVO<sup>1</sup> also provides governmental advice, advice to organisations and networks and advice to SME's and other companies (ILVO, n.d.).

As mentioned in section 2, the **experimental stations** form a vital element in the Flemish AKIS. The experimental stations for crop production act as a link between applied research and the production sector: they translate existing knowledge in practical applications and disseminate this knowledge in a neutral manner in the agricultural sector. In total there are 12 experimental stations for crop production, an overview is provided in Annex 1. Farmers can be members of an experimental station which makes that the experimental stations mostly have a very good view of the needs of the agricultural sector. Some (private) advisors are also connected to the experimental stations and some experimental stations even provide advisory services (e.g. *Inagro vzw*). The experimental stations for animal

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<sup>1</sup> Further information about the services ILVO provides can be found on their website: <https://www.ilvo.vlaanderen.be/language/en-US/EN/Services-and-Products.aspx>

production can be considered as knowledge networks, rather than physical institutions. Their aim is to be a point of contact for practical knowledge and the implementation of practical research in the animal sector. There are 5 experimental stations for animal production, these are also listed in Annex 1.

Of the five **Farmers's unions** in Flanders, *Boerenbond* can be considered the largest. It has several sub-organisations such as *BB Consult*, which is their advisory department and *Innovatiesteunpunt*. *Innovatiesteunpunt* can also be considered a key player in the Flemish AKIS as they are the only institution in Flanders that acts as an innovation broker. The consultants working at *Innovatiesteunpunt* have experience in supporting business who wish to innovate, whether these are technical innovations, strategic innovations, etc. *Innovatiesteunpunt* is also often involved in EIP operational groups, helps farmers find the right subsidy scheme, etc. Because of the position of *innovatiesteunpunt* in the Flemish AKIS, the Flemish government chose not to fund innovation brokerage through the RDP III programme.

*Boerenbond* also organises farmers' meetings called *bedrijfsleiderkringen*. These can be considered as local networks of farmers that come together on a regular but informal basis, on the farm of one of the participants. Trust is very important in such a network as, during a meeting, the farmers will share their financial and technical records. A technical consultant of *Boerenbond* will also be present to facilitate the meeting. He/she also inputs these numbers in the bookkeeping system of *Boerenbond*, which is later reported online and through hard copy. The results are also discussed in the *bedrijfsleiderkringen*, which allows the farmers to learn from each other. Furthermore, *Boerenbond's* bookkeeping system is used as information for the government as it gives insight in certain statistics (e.g. the amount of milk that is being produced, how many antibiotics are being used, etc.).

Another form of local networks are the *landbouwcomicen*. These networks are groups of farmers working and living in the same area who organise regular meetings to exchange knowledge. The comicen are funded through the provinces.

Furthermore there are numerous other organisations and structures which provide a valuable contribution to the Flemish AKIS such as private research institutions, the agricultural press and several non-profit organisations, all aimed at providing agricultural services. They are however too numerous to address them all in this document.



collaboration with public or private partners at regional, national and international levels.

The **Collège des producteurs** is made up of assemblies of producers, by production sector or by particular theme (aquaculture, organic agriculture, rabbit farming, dairy cattle, beef, potatoes, pork, sheep/goat, field crops, ornamental horticulture, edible horticulture). Its role is to represent all farmers in the region. It is made up of members proposed by agricultural associations, professional associations in the agri-food and distribution sector, consumer associations and environmental protection associations. It provides farmers with forums for dialogue so that they can express their opinions and share their ideas on working conditions, expectations and developments in the sector. These opinions, emanating directly from producers, are intended to guide Walloon research and the policy for the promotion of Walloon agriculture conducted by the Walloon Agency for the Promotion of Quality Agriculture, (*l'agence wallonne pour la promotion d'une agriculture de qualité*, APAQ-W). These opinions will therefore participate in the development of strategic plans for research and the promotion of agriculture. The *support opérationnel au collège des producteurs* (SOCOPRO) is an association approved by the Walloon Government. It supervises the *Collège des producteurs* and draws up an annual activity report (analysis of activities, inventories of farmer participation methods and evaluation of methods) which it sends to the administration.

In Wallonia, the government has approved eleven **pilot centres** (*Centres pilotes*). They are responsible for the development of a production sector or a particular theme. They ensure that the results of research or innovations, developed within them, are passed on to producers. Their field of action covers the whole of Wallonia. To do so, they coordinate the activities of the production sector or the theme being monitored. They carry out practical experiments, implement demonstration projects, assist producers on technical, economic, social and environmental levels. Furthermore, they draw up an annual action programme. Communicating information and transferring knowledge to farmers can be effective, especially when the advisor at the pilot centre is also a farmer. An overview of the different pilot centres in Wallonia is provided in Annex 2.

Similar as in Flanders, Wallonia has several **Comices agricoles**. The *Comice agricole* is a neutral association of active farmers, whose farms are located within a homogeneous agricultural region, and whose mission is to promote the exchange

of knowledge and information between members. The areas of action of these comices agricoles correspond to communal territories.

**Agricultural unions** (*Syndicats agricoles*) are also active in the provision of services. In Wallonia, the main agricultural organisation is the *Fédération Wallonne de l'Agriculture* (FWA). In addition to its function of political representation of farmers, it offers advisory services to farmers, mainly on how to apply or comply with various European, national or regional regulations and standards (on rural development, water management, environmental standards, etc.).

Other unions include the *Fédération Unie de Groupements d'Éleveurs et d'Agriculteurs* (FUGEA), the *Union Nationale des Agrobiologistes Belges* (UNAB), the *Fédération des Jeunes Agriculteurs* (FJA), the *Union des Agricultrices Wallonnes* (UAW) and the *Fédération Horticole Wallonne* (FHW).

Many **non-profit associations** provide advisory services in a wide range of fields. One of them is specifically dedicated to farmers facing financial or other difficulties, called **Agri-call**. In addition, other AKIS actors may include agricultural cooperatives, independent agricultural networks, farmers' organisations, veterinarians, private agricultural consultants, agro-supply companies and agri-food companies.

Similar to *innovatiesteunpunt* in Flanders, the organisation **Agri-innovation** was founded to help farmers and foresters setting up innovation projects and help them finding the right partners to achieve these innovations.

Each year, the Walloon government appoints several producers as **Centre Régional de Référence d'Experimentation** (CRE). They have the task of disseminating research and experimentation in the agricultural sector. These centres, thanks to a subsidy granted by the administration, are a means of enhancing and disseminating the experience of a "recognised" farmer on a new method, a new product and, in general, on any novelty. These centres give the farmers the opportunity to become informed and to see the interest of a proposed technique. The centres are therefore a place for exchange and sharing of experience. They help farmers to find alternative practical solutions to overcome difficulties encountered or to implement new processes or methods.

## 4.2. Public policy, funding schemes, financing mechanisms, advisory service providers

### Flanders

There are two main bodies for **research funding** in Flanders: The *Fonds voor Wetenschappelijk Onderzoek* (FWO) and the *Agency for Innovation and Entrepreneurship* (*Agentschap Innoveren en Ondernemen*, VLAIO), the latter is a part of the Flemish government. FWO provides PhD fellowships, postdoctoral fellowships, and research grants both for fundamental and for strategic research. VLAIO supports projects and PhD fellowships with an economic objective or innovative strategy.

The Flemish government provides a broad range of **support measures for agriculture**. Many of them are part of the Flemish Rural Development Programme (RDP). One of the key support measures is Flanders' **VLIF-support programme**<sup>2</sup>. VLIF stands for *Vlaams Landbouwinvesteringsfonds* which can be translated as Flemish Agricultural Investment Fund. Its aim is to stimulate sustainable investments and to improve the structure of Flemish agricultural- and horticultural businesses. The programme entails different subsidy schemes, many of which form part of the Flemish RDP programme: measures M04, support to investments at the farm, M04 support for innovation projects in agriculture, M04 support for the processing and marketing of agricultural and horticultural products, M04 support to non-productive investments at the farm, M06 take-over support for young farmers and M06 support for the development of small agricultural businesses. Furthermore, the VLIF programme comprises the support subsidy for the experimental stations (*steun aan de omkaderingssector*) (see section 2 for more info). This support subsidy is the only non-RDP measure of the VLIF programme. RDP measure M04 support for innovation projects in agriculture comprises projects which are not on the list of projects eligible for VLIF-support, and can thus be seen as innovations. When an innovation is proven successful, it can be added to the list of eligible projects (M04 support to investments at the farm). The support for M04 is higher (40% of the investment) than support provided by other measures under the VLIF-support programme (only 30% of the investment), since it covers novel techniques. Some examples of innovation

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<sup>2</sup> For more information on the VLIF-programme:

<https://lv.vlaanderen.be/nl/subsidies/vlif-steun-voor-de-land-en-tuinbouw#>

projects are a stable for pigs where they can scrounge around in the dirt, an air washer for an open dairy stable, a cooled stable floor, an electronic feed installation for sows, etc.

Another RDP measure focussed on innovation is the support for the creation and activities of the **EIP operational groups** (RDP measure M16), which goal is to stimulate interaction between research and practice. The knowledge exchange in operational groups has to lead to new insights and ideas by moulding implicit knowledge into practical solutions. The involvement of farmers and horticulturists leads to research questions better suited to the needs of the sector, and shows researchers how their results are put into practice.

Apart from private companies and farmers' associations providing advisory services, the Flemish government implemented the **KRATOS-system** as the output for the European requirement of installing a Farm Advisory System (FAS). This service provides business economic and environmental advice, as well as information about cross-compliance, greening, etc. and is also part of the Flemish RDP (measure M02, advisory services). An overview of the different advice modules is provided in Annex 3. The selection of the advisors providing KRATOS advice is organised through public procurement. The advisors are private companies, independent advisors, research institutions or advisors linked to experimental stations (e.g. Inagro vzw). In 2016, there were 13 advisory services employing 145 advisors in total. The advisory service is completely free for the farmer. However, farmers wishing to request advice from module 1 (business plan) and module 2 (management advice), can only do so when they have already requested an advice from module 5, 6, 7, 8 or 9. This requirement was installed to get farmers more interested in some 'less attractive' themes and provide them with themes they would most likely not request information on by themselves. During the programming period of RDP III, starters (businesses where one of the business managers is younger than 41 and has been active as a farmer for less than 5 years) can request 1 advice from each module only once, except for module 1 and 2, for which they can request advice twice. Non-starters can request advice for each module only once.

Organic farmers cannot request advice on module 1 (business plan) and module 2 (management advice), as they can make use of the **subsidy scheme for organic farming**. The advice system for organic farming is very similar to the KRATOS advice system. However, advice for organic farming is not free for the farmer and

the support covers only a fraction of the advice cost. The system is also not funded through RDP III, but through Flemish means.

Other Flemish RDP measures<sup>3</sup> that have an impact on knowledge exchange in the Flemish AKIS are measures M01.1 **support for training activities on agriculture** (training- and refresher courses) and M01.2 **demonstration projects**. Communication on RDP measures is the responsibility of the Flemish Rural Network. Officials of the Flemish government indicated that it is very difficult for them to assess the impact of these measures because of a lack of guidelines regarding impact indicators coming from the European Commission.

Lastly we want to mention the **Landbouwloket**. This is a service provided by the Flemish provinces to the municipalities it contains. The landbouwloket provides advice and support on topics as greenhouse horticulture, rural development projects, questions related to leasing of agricultural lands, etc.

## Wallonia

Since the instalment of the *Code Wallon de l'Agriculture*, the **Strategic Committee for Agriculture** (*Comité stratégique de l'agriculture*, COSTAGRI) was set up. The committee is made up of the Minister of Agriculture, the Directors-General of the SPW ARNE, the CRA-W and the Apaq-W, their deputy Directors-General and the inspectors of the administration with agricultural responsibilities. The committee draws up and proposes operational plans to the Walloon Government. It also monitors the operational plans, coordinates their implementation and informs the *Collège des producteurs*. Finally, it responds to requests from the *Collège des producteurs* and other agricultural associations. It liaises with the SPW EER on matters falling within its remit and may also consult the *Collège des producteurs* or other bodies for its tasks. In this way, the Walloon government tries to involve farmers in the definition of its agricultural policies and action plans. More info on agricultural policy making in Wallonia is provided in section 2.

The **results of agricultural research** are disseminated to farmers in particular by the SPW ARNE. The central services are directly involved in the monitoring of subsidised support associations and in the development of public policies in terms

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<sup>3</sup> For an overview of all Flemish RDP III measures, see:  
<https://lv.vlaanderen.be/nl/landbouwbeleid/plattelandsontwikkeling/pdpo-iii-maatregelen>  
or  
<https://ruraalnetwerk.be/pdpo-iii/pdpo-iii-maatregelen-departement-landbouw-en-visserij>

of research, knowledge transfer, innovation, etc., while the external services are active in the direct provision of collective activities for farmers (training, open days, various events, conferences, etc.) and the monitoring of demonstration projects and the CRE's including the *Comices Agricoles* network.

The provincial administrations are also active in advisory activities through the **Offices Provinciaux Agricoles** but have limited resources in this respect. They offer coaching and advisory services to farmers and are therefore close to them. Within these provincial offices there are also analysis laboratories at the service of citizens and farmers (e.g. for soil analysis, farm manure analysis, microbiological analysis...). However, the research is rather done in research structures (universities, CRA-W, etc.).

As is the case in Flanders, Wallonia implemented a rural development program. It is managed by SPW ARNE but communication regarding the **RDP measures**<sup>4</sup> is outsourced to the Walloon Rural Network. The Walloon RDP is slightly different than the Flemish one. For the programming period 2014-2020 Wallonia decided not to implement measure M01.1 vocational training. In the previous period SPW EER used to manage this measure as they are responsible for education.

Measure M01.2 **demonstration activities and information actions** was implemented, this measure aims to support information actions and demonstration projects with a view to enabling micro-enterprises and SMEs active in the agricultural, forestry and forest-based sectors to acquire the skills needed to increase their competitiveness, innovate and improve their environmental performance.

Measure M02 **advisory services** had two calls for projects with themes set by the minister in 2016 and 2017, however this measure was not successful as the administrative burden was too high for the beneficiaries. Measure M02 has no link with the Walloon Farm Advisory Service.

For the moment, there is no form of independent (non-commercial) advice coming from or funded by the Walloon government, however it is currently under

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<sup>4</sup> For an overview of all Walloon RDP measures:

<https://www.reseau-pwdr.be/sections/le-programme-wallon-de-d%C3%A9veloppement-rural-%28pwdr%29>

consideration in the framework of the post-2020 CAP reform and the new Walloon Pesticide Reduction Programme.

Within the RDP framework, Wallonia also provides a system of aid for development and settlement in the agricultural sector, known as **ASIDA** (*aides au développement et à installation dans le secteur agricole*). It appears, however that the Walloon agricultural policy is less focused on innovation.

As in Flanders, the Walloon officials also indicated the difficulty of measuring the impact of the RDP measures because of a lack of result indicators.

### Survey results

Based on the survey, the majority of advisors/advisory organisations in both Flanders and Wallonia indicate there is a combination of funding sources for their organisations (Figure 5). In Flanders, most often mentioned sources of funding are through cost-recovery from farmers (fee for service financing)(12/13 responses), national/regional public funding (6/13) and EU CAP projects and funds (5/13). In Wallonia, the most often mentioned source of funding is national/regional public funding (15/16), followed by funding through cost-recovery from farmers (fee for service financing) (8/16) and contributions (membership fees)(5/16 responses). Funding through EU CAP projects and funds was mentioned only once. Differences in this case may also be explained by the different respondent profiles for Flanders and Wallonia (more commercial organisations in Flanders vs. more public organisations in Wallonia; see also Figure 3)

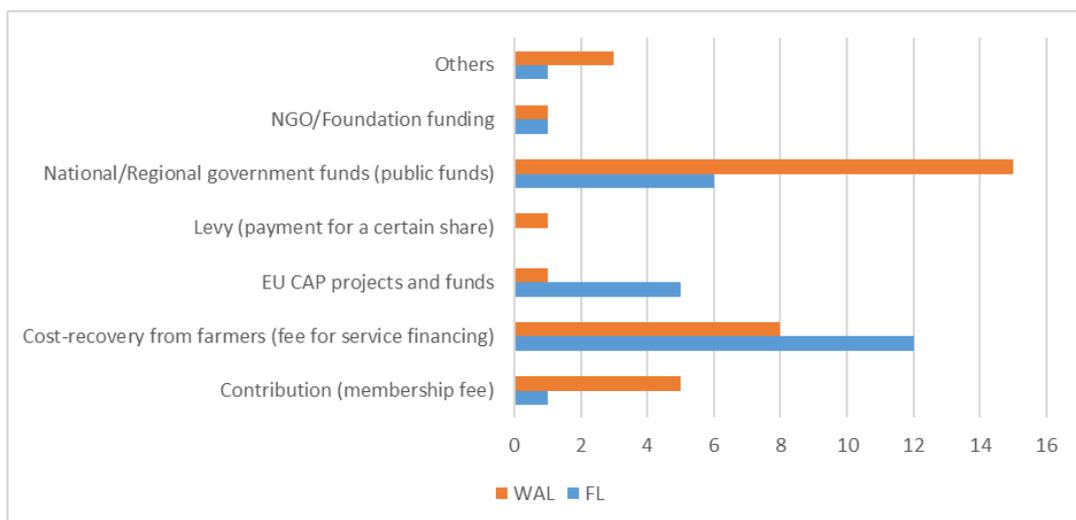


Figure 5: funding sources for advisory providers in Flanders and Wallonia based on survey results (n=29).

About 1 in 3 organisations (3/13 in Flanders, 6/16 in Wallonia) indicated funding had changed more than 10% over the last 3 years. For all but one, this was an increase either due to what was labelled by the organisations as a growth strategy, through an increase in services and project funds, or through an increase in their subsidies received from government. One organisation noted a significant decrease in funding, through a cut in their subsidies.

### 4.3. Human resources and methods of service provision

Survey respondents differed quite significantly in organisation size, ranging from organisations with 2 employees to organisations employing 500 people (6-500 for Flanders, 2-145 in Wallonia). Three advisory organisations indicated having a fully male advisory staff, 34% (10/29) indicated having 25% or less female advisors. A little more than half of the organisations indicated having specific staff dedicated to back-office activities. This appeared to be more common in Flanders (10/13 vs. 6/16 in Wallonia). None of the respondents indicated a decrease in number of advisors in their staff over the past 5 years. For the Flemish organisations about half indicated it stayed the same (7/13), while the other half indicated a significant increase. For Wallonia, only 3/16 organisations indicated a significant increase.

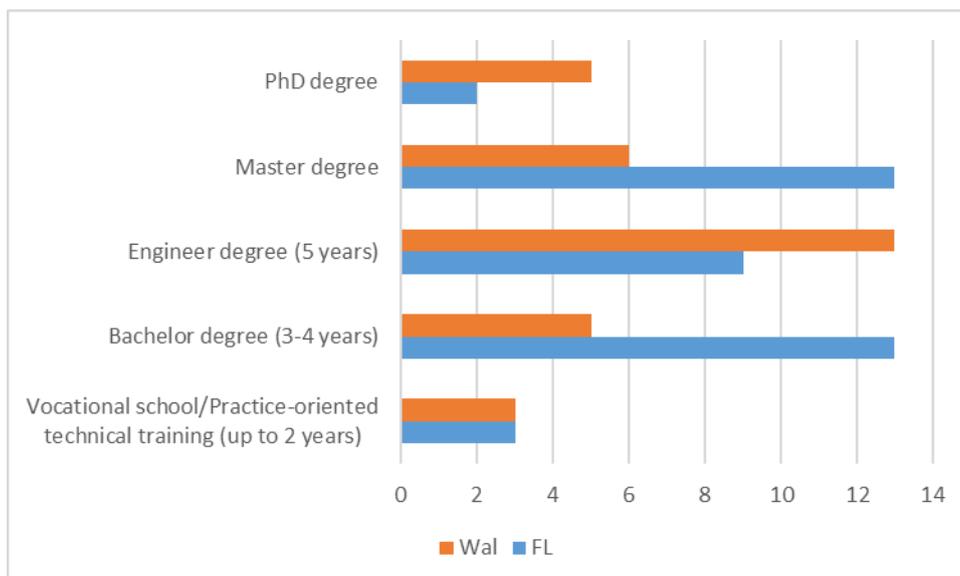


Figure 6: Education level of advisors (n=32; multiple responses possible)

The education level of the advisors within the organisation is most often a mix of different profiles. Most common are Bachelors, Masters or Engineering degrees (Figure 6). Approx. 1/3 of the organisations also indicated having additional advisory certifications linked to offering advice on specific topics (e.g. for offering advice on crop protection, advisors require an additional phytolice certification (P2 or P3), both in Flanders and Wallonia; a specific certificate is required to offer advice to organic farms).

Individual advice on the farm was identified as the main advisory method both in Flanders and Wallonia. Also other forms of individual advice are common, although Flemish organisations seem to opt more frequently for digital apps and mails, while in Wallonia, advice over telephone or face to face outside the farm is still predominant. Group advice seems to be common in both regions, although again here digital tools are more commonly used in Flanders (Figure 7). When looking at the proportions of used advisory methods it becomes apparent that for the vast majority of Flemish advisors/advisory organisations, individual advice is their main occupation (global average of 71%). This is then followed to a lesser extent by group advice (average of 20,5%) and mass media (average of 8,5%). In Wallonia, individual advice is also the main form of advice (average of 55%), but relative importance is lower compared to group (27%) and mass-media advice (18%). With regard to the COVID-19 pandemic the majority of advisors/advisory organisations (85% for Flanders and Wallonia combined) indicated there has been a change in methods used. These changes include less on-farm visits, less group advice and more advice via digital media or telephone (both for individuals and groups).

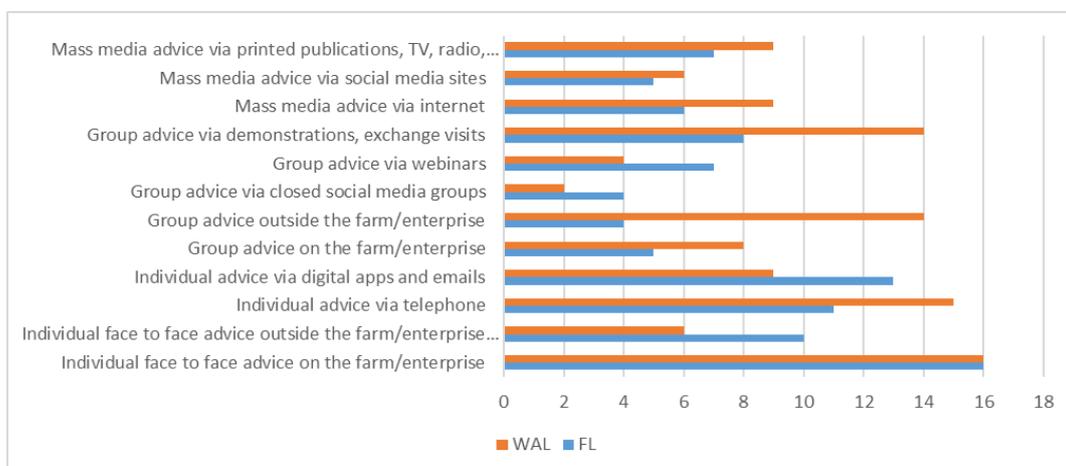


Figure 7: Advisory methods used most frequently from the advisory organisations (n=32, multiple responses possible)

## 4.4. Clients and topics/contents

With regard to advisory activities, almost all advisors/advisory organisations indicated ‘consultancy and backstopping’. Most also indicated ‘creating awareness and facilitating exchange of knowledge’ and half of them indicated ‘training and capacity building’ as one of the main advisory activities. Most organisations indicated that their organisation advises farmers to adapt their farms to the cross-compliance requirements by EU-FAS.

In terms of characterization of the client groups of these organisations, the results of the survey showed a large diversity for most advisors/advisory organisations both in Flanders and Wallonia. As can be expected, farmers (with different profiles) are the main target audience, and only few organisations indicated offering advice to foresters (Figure 8). To the question ‘how many clients or client groups contact you/your organisation for advisory services’, answers ranged from 40 to 6000 in Flanders, and from 40 to 7500 in Wallonia.

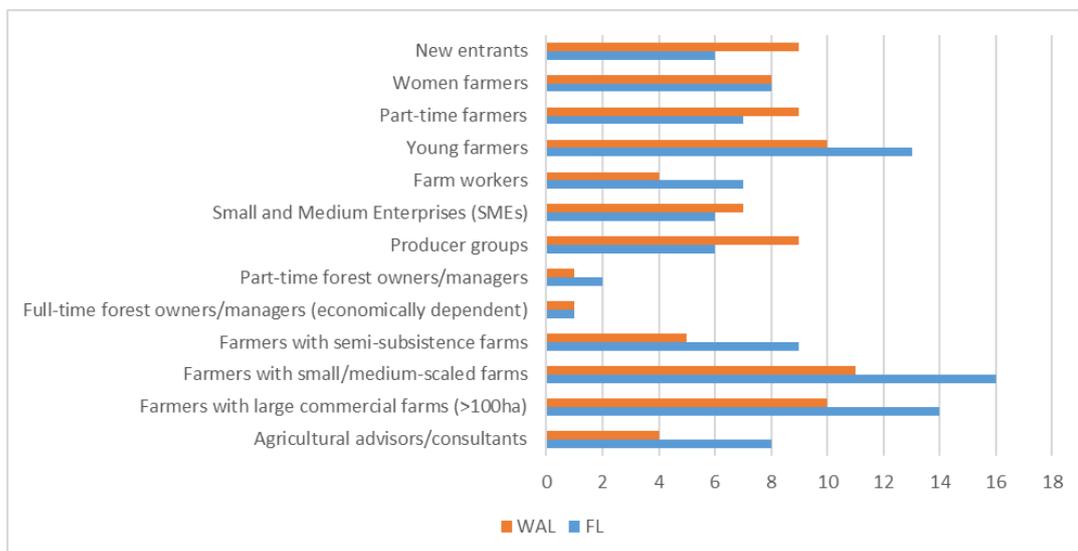


Figure 8: Primary target groups of advisory organisations (n=32; multiple responses possible)

For Flanders, the results of the survey indicated a large interest for the topics ‘entrepreneurship and farm management’, and to a lesser extent for ‘accounting/bookkeeping’ among the clientele of the advisors/advisory organisations. This finding corresponds to the judgement of the Flemish officials who anticipated a larger interest for these themes, than for any other theme,

when establishing the KRATOS system. Notably, the topic with the highest interest is ‘agri-environmental stewardship measures and nature conservation’, followed closely by ‘support with grant application and compliance with regulation and standards’. For Wallonia, a large interest in the topics ‘production technologies’ and ‘entrepreneurship and farm management’ among the clientele of the advisors/advisory organisations appeared from the survey results. Compared to Flanders, much less interest in ‘agri-environmental stewardship measures and nature conservation’ ‘support with grant application and compliance with regulation and standards’ was noted. While there may be different reasons behind this difference, one of the reasons may be the use of the KRATOS system, where advice on farm management is coupled to advice on topics such as greening criteria, biodiversity, climate and water.

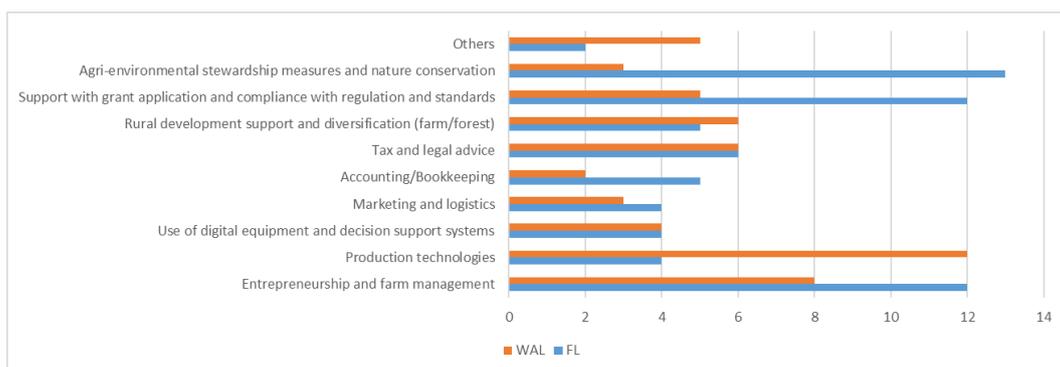


Figure 9: Cross-cutting advisory topics demanded by clients (n=32, multiple responses possible)

With regard to the main advisory activities of the advisors/ advisory organisations, again the results are very similar to those of Flanders, with all participants identifying ‘consultancy and backstopping’ as a main activity, most of them also indicating ‘creating awareness and facilitating exchange of knowledge’ and almost half of them indicating ‘training and capacity building’. A slight difference with the results of Flanders is that most of the Walloon advisors/advisory organisations also marked ‘networking/facilitation/brokerage’ as a main activity. As is the case for Flanders, most Walloon organisations indicated that their organisation advises farmers to adapt their farms to the cross-compliance requirements by EU-FAS.

## 4.5. Linkages with other AKIS actors/knowledge flows

### Flanders

The Flemish AKIS can be considered as a very integrated system. At the core of it are the experimental stations and the farmers' unions who are strongly linked with the farming community. In this context *Innovatiesteunpunt* deserves a special mention as this organisation maintains a close connection to most AKIS actors as they take on the role of knowledge broker in the Flemish AKIS network. In terms of research, the experimental stations and institutions for higher education are more closely connected to the farming community than the universities. The weakest issue seems to be the advisory system which is not integrated enough in the Flemish AKIS. There seems to be a weak link between the (private) advisory services and agricultural research. Furthermore, there is currently no obligation for advisors to engage in training activities in order to get selected as an advisor for the KRATOS system. Of course, this does not apply to all advisors, e.g. there are agricultural advisors who are linked to the experimental stations and are therefore more informed about the latest developments in agricultural research or advisors who are more familiar with research out of their own interest. Knowledge exchange between different advisory services is also not always possible because of competition. Cooperation is possible for themes where different advisory services are complementary.

### Wallonia

As mentioned in section 4.2, there are many actors in the Walloon AKIS. There are no exact figures on the number of research and management structures, but there are more than 100<sup>5</sup>. Wallonia thus has a lot of resources in terms of knowledge and support services for farmers, however, because of the plurality of these services, it is hard to find a proper overview of the specific expertise of each actor. Furthermore, because of competition, it seems many actors do not wish to share their knowledge with other organisations. Sometimes partnerships between different organisations occur in the context of a call for projects but this does not happen on a daily basis. In general there is a lack of coherence and resonance

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<sup>5</sup> Following website provides a tool for farmers to help find organisations, relevant to their situation:  
<https://acteursagriculturewallonie.be>

between the different Walloon AKIS organisations. Officials of the Walloon administration indicated that a reflection about the rationalisation of the actors of the Walloon AKIS is in progress in the context of the post-2020 CAP reform. Regarding agricultural research, it appears the pilot centres are more closely linked to the farming community than other research institutions such as CRA-W and the universities.

**Survey results**

From the survey results it became apparent that most Flemish advisors/advisory organisations indicated a strong degree of cooperation in advisory service delivery with the farmer based organisations and with the public authorities.

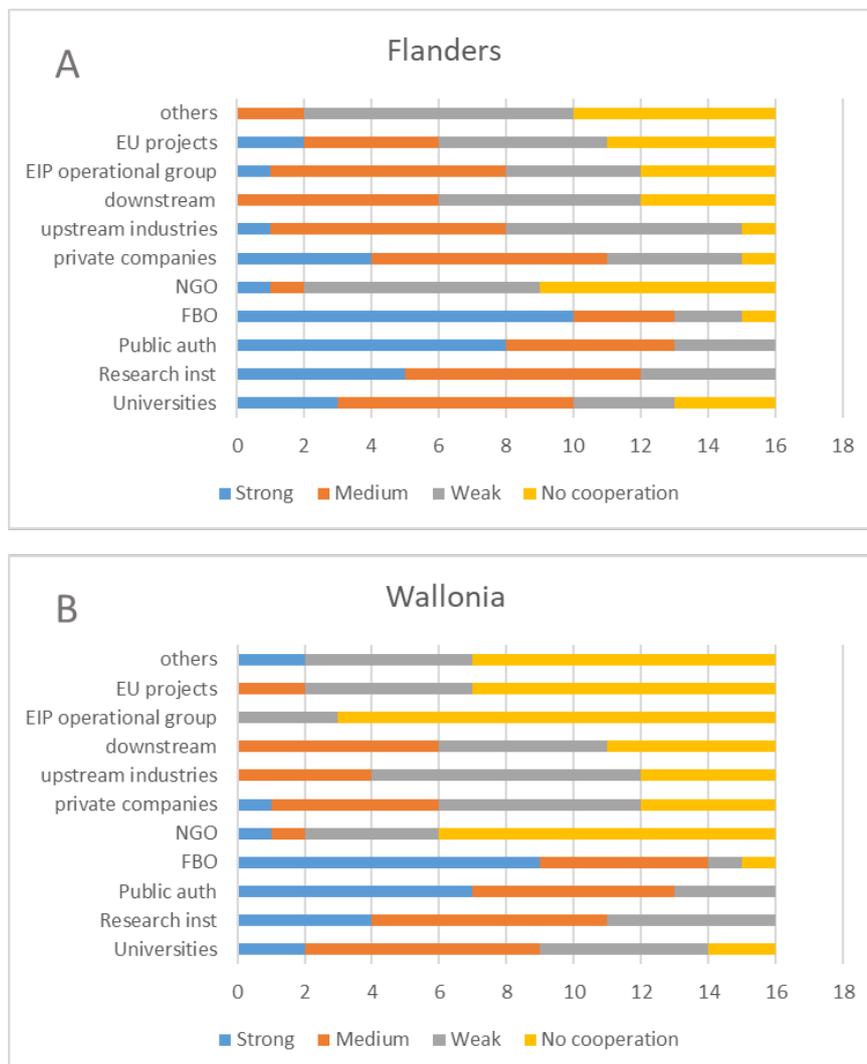


Figure 10: Strength of cooperation between advisors/advisory organisation and other AKIS actors; A: for Flanders (n:16); B: for Wallonia (n=16)

Regarding cooperation with research institutions and universities, no clear pattern could be distinguished, some indicated a strong degree of cooperation whilst others indicated no cooperation at all. Only a few advisors/advisory organisations indicated a strong link with EIP operational groups and EU projects (Figure 10A). Similarly, for Wallonia also a strong degree of cooperation of the advisors/advisory organisations with the farmer based organisations and the public authorities in advisory service delivery was indicated. Regarding cooperation with research institutions and universities, the results for Wallonia also do not show any pattern. No Walloon advisor/advisory organisation indicated a strong link with EIP operational groups and EU projects, in fact almost all participants indicated a weak link or no cooperation at all (Figure 10B).

#### **4.6. Programming and planning of advisory work**

Both in Flanders and Wallonia, a little over half of the organisations indicated having a staff development strategy/plan (58% and 56%, respectively). In Flanders, 50% of the organisations indicated having a trainer/trainer unit responsible for developing staff capacity, while this was only the case for 25% of the Walloon organisations. Organisations without a dedicated trainer/training unit, indicated that staff development mostly occurred through participation in external trainings and seminars. Less frequently also peer-learning or self study were mentioned. About half of the Flemish organisations indicated having a reward system in place for good performance or as incentives for skill developments, usually in the form of (non-recurrent) bonuses, while this was only the case for one Walloon organisation. This however may also be linked to the fact that more of the respondents in Flanders were commercial companies.

From the survey results, it seems information dissemination and target consultation services (business plans, credit/subsidy application, etc) takes up most of the advisors' time, followed by innovation support activities (facilitation, networking, brokerage), both in Flanders and Wallonia. Only a lesser percentage of their time (approx. 8%) is dedicated to participating in training programs. As a minor difference, it appears that in Wallonia less time of the advisor goes to target consultation services (business plans, credit/subsidy application, etc.) and more time goes to teaching and training activities than is the case for the Flemish organisations (Figure 11).

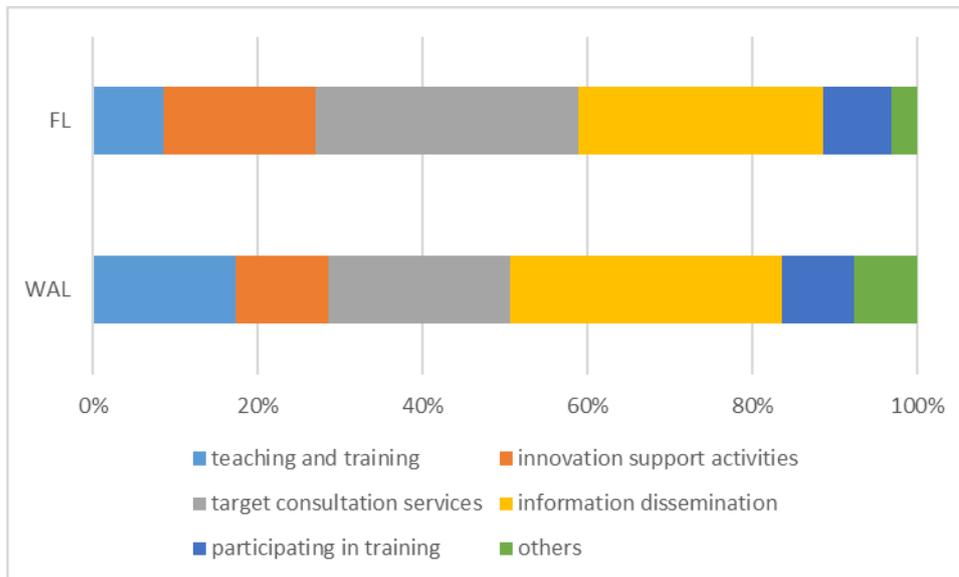


Figure 11: Advisors time allocation for a number of different activities (n=12 for Flanders; n=17 for Wallonia)

## 4.7. Advisory organisations forming the FAS and evaluation of their FAS implementation

### Flanders

In order to comprehend the implementation of the Farm Advisory System in Flanders, an overview of the advice systems implemented under the different RDP programming periods has to be taken into account:

During RDP I, the advice system consisted only of accountancy related advice. The advisory bodies involved were thus all bookkeeping companies.

At the start of RDP II, the FAS obligation was installed and Flanders chose to couple this to the advice system that was already installed in RDP I. When a farmer requested (economic) advice during RDP II, he was also given advice regarding cross-compliance. The advisory bodies were still bookkeeping companies, with a focus on agriculture. This system was called BAS. More info on BAS is provided in section 3.

For RDP III, the advice system was transformed into the KRATOS advice system which, apart from including economic themes (modules 1 and 2), info on cross-compliance (module 3) and info on greening (module 4), also covers advice on environmental themes, which makes the advice service more diverse than it was during RDP II and RDP I.

Because of the history of the advice system, the member state authorities on KRATOS anticipated a higher popularity of the economic modules. Therefore, they installed the obligation of requesting advice on one of the environmental themes or on the occupational safety module (modules 5, 6, 7, 8 and 9) in order to be able to request advice on business plan or management advice (modules 1 and 2). In short, FAS in Flanders was programmed under M02 KRATOS for RDP III. Every reference in this document to FAS, refers to RDP III measure M02 KRATOS. Currently, there is no system in place to assess the impact or quality of an advice.

### **Wallonia**

In Wallonia, the Farm Advisory System was implemented as the *Système de conseil agricole*. Wallonia chose a simple structure, based on the use of existing structures already subsidised by Wallonia for the matters to be covered by the European regulation. Wallonia did not call on the European budget, either for the implementation of the system, nor for the cost of the consultancy service. On the other hand, Wallonia took advantage of the opportunity provided by the drafting of the *Code wallon de l'Agriculture* to include a whole section on the FAS (section 4 of the code). The organisations already subsidised had to reorient their actions and adapt their work programme to possible additional subsidies. The operations of these organisations are evaluated within the monitoring committee by the administration and via half-yearly and annual reports. However, as with the evaluation of the RDP measures, the Walloon officials indicated it is difficult to assess whether the advice is being followed or applied on the farm because of a lack of result indicators. In 2016, there were 23 advisory services employing 129 advisors which provided FAS<sup>6</sup> advice in Wallonia.

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<sup>6</sup> More info on the Walloon FAS:  
<https://agriculture.wallonie.be/systeme-de-conseil-agricole>

## 5. Summary and conclusions

### 5.1. Summary and conclusions on sections 1 – 3

Belgian agriculture has seen a sharp decrease in the number of agricultural holdings in both regions. This is also reflected in the contribution of the sector to the total employment of the country and its decreasing economic interest. Nevertheless, the sector remains economically important, as the agri-food sector still takes second place in Belgium's industry. Also an intensification of the agricultural sector can be perceived as the average farm area has tripled in size over the same time period. Like many other European countries Belgium is faced with many environmental challenges and has to find a balance between these issues and the socio-economic issues at stake, which is why in both regions agricultural policy is mainly focussed on sustainability.

Belgium is characterised by a decentralisation of public policy in general. This becomes very clear when looking at Belgium's agricultural policy where there is almost no contribution of the federal government. For this reason it was opted to construct two different AKIS diagrams for the Flemish and the Walloon region. Both regions chose to implement a public policy characterised by a delegation of services. There is almost no form of independent agricultural advice coming from either government. However, the Flemish and Walloon governments support both AKIS' with institutional support and competitive calls. The main task of both administrations is to fund various AKIS actors and to monitor and follow-up on the activities of these actors. The institutional support in Flanders is focussed towards several large institutes such as the research institute ILVO, the experimental stations and the universities. In Wallonia, a larger range of institutions and organisations receive institutional support of which the research institute CRA-W, the pilot centres, the *Collège des producteurs* and the farmers' unions are the main beneficiaries. The delegation of services in Wallonia goes even one step further as the maintenance of the Walloon Rural Network is outsourced to an external organisation.

Over the past years, the main changes in public policy that had an influence on agricultural advisory services in Belgium were the implementation of the KRATOS system in Flanders and the installation of the Walloon Code of Agriculture. With the KRATOS system, the Flemish government tries to support a broader range of

topics of agricultural advice. In the past, the focus was mostly on economic and business advice. However, currently the KRATOS system is not very well known among the Flemish agricultural community. With the Walloon Code of Agriculture, the Walloon government tries to define a vision for agriculture as well as establish more coherence in agricultural regulations by grouping them in a single code.

## 5.2. Summary and conclusions on section 4

Both Flanders and Wallonia are characterised by an AKIS that is made up of a large multitude of actors, each having their own area of expertise. In Flanders, the AKIS is centred around the experimental stations who provide a link between applied research and the production sector and the farmers' unions. Both types of organisations maintain a close connection with the agricultural community in Flanders. Another important actor in the Flemish AKIS is *Innovatiesteunpunt*, an organisation focussed on knowledge brokerage and innovation support. *Innovatiesteunpunt* maintains strong links with many actors in the Flemish AKIS and is often involved in EIP operational groups. There are many other organisations and institutions that all are interlinked to some degree, which is why the Flemish AKIS can be considered as strong and integrated. The weakest issue of the Flemish AKIS appears to be the advisory system which still has a weak link to agricultural research. There is also no obligation for advisors to engage in training activities in order to get selected as an advisor for the KRATOS-system. This is a generalisation and of course does not apply to all (private) advisors/advisory institutions. Advisory services in Flanders mostly operate on a regional scale. With regard to topics for advice, economic and business advice (entrepreneurship, farm management, accounting/bookkeeping) still appear to be the most popular ones among the Flemish agricultural community. However, a growing interest for agri-environmental stewardship measures and nature conservation can be perceived. The Flemish government provides a wide array of support measures, primarily through the RDP program, but also through Flemish means. Looking at these measures it becomes apparent that innovation is a key aspect of the Flemish agricultural policy and support measures. The best examples are the RDP measure M04 support for innovation projects in agriculture and support for the creation and activities of the EIP operational groups (RDP measure M16). Furthermore, The Flemish agency for Innovation and Entrepreneurship also

supports projects related to agriculture with an economic objective or innovative strategy.

In Wallonia, the pilot centres, the *Collège des producteurs* and a large range of other organisations and institutions form the backbone of the AKIS. Wallonia has a lot of resources in terms of knowledge exchange and support services for farmers but because of the plurality of these service providers it is hard to find an overview of the specific expertise of each actor. It also appears many actors do not wish to share their knowledge with other actors because of competition. Because of the lack of coherence and resonance between the different Walloon AKIS organisations, the Walloon AKIS can be considered as strong but rather fragmented. Advisory services in Wallonia also appear to operate on a regional scale and seem to spend slightly more time on teaching and training activities and participating in training programs than their Flemish counterparts. In Wallonia, the topics ‘production technologies’ and ‘entrepreneurship and farm management’ appear to be the most popular ones among the Walloon agricultural community. Compared to Flanders, much less interest in ‘accounting/bookkeeping’ and ‘agri-environmental stewardship measures and nature conservation’ can be perceived. The Walloon government also supports agriculture through an array of support measures, however, they seem less focused on innovation than is the case in Flanders. The FAS in Flanders is incorporated in the KRATOS system. In Wallonia it is implemented as the *Système de conseil agricole*. For both regions it appears to be difficult to measure the impact of the FAS as well as of other agricultural support measures. This could be due to a lack of guidelines regarding impact indicators coming from the European Commission.

## **6. Acknowledgement of partners**

The Authors would like to thank the Department of Agriculture and Fisheries of the Flemish government, Innovatiesteunpunt, the SPW ARNE of the Walloon government and Agri-Innovation for their contribution to this document. Furthermore the authors would like to thank the advisors and advisory organisations who participated in the online survey.

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## Appendices

### Annex 1: Overview of experimental stations

Experimental station crop production

Koninklijk Belgisch Instituut tot Verbetering van de Biet vzw (KBIVB)
Interprovinciaal Proefcentrum voor de aardappelteelt (PCA)
Landbouwcentrum Granen vzw (LCG)
Proefcentrum voor Sierteelt (PCS),
Proefcentrum fruitteelt vzw (pcfruit),
Inagro vzw
Provinciaal Proefcentrum voor de Groenteteelt Oost-Vlaanderen vzw (PCG)
Proefstation voor de Groenteteelt (PSKW)
Proefcentrum Hoogstraten (PCH)
Landbouwcentrum voor Voedergewassen vzw (LCV)
Praktijkpunt Landbouw Vlaams-Brabant vzw (NPW)
Vlaams Centrum voor Bewaring van Tuinbouwproducten (VCBT)

Experimental station animal production

Experimental station cattle/beef
Experimental station pork
Experimental station poultry
Experimental station small ruminants
Experimental station bees

### Annex 2: Overview of pilot centres

CEHW	Floriculture and plant nurseries
CePiCOP	Cereals, oilseeds and protein crops
CEPIFRUIT	Fruit cultivation
CIM	Vegetables for the fresh market
CPLV	Vegetables for processing
CPM	Corn
FIWAP	Potatoes
FOURRAGEMIEUX	Fodder
GFW	Strawberries and woody berries
IRBAB	Beets and chicory
UAP	Christmas trees

## Annex 3: Overview of KRATOS modules

- Module 1: Business plan
- Module 2: Management advice
- Module 3: Eligibility criteria for direct support
- Module 4: Greening criteria for direct support
- Module 5: Biodiversity
  - Module 5A: Agri-environment action regarding biodiversity
  - Module 5B: Conservation targets (IHD, 'instandhoudingsdoelstellingen') and the integrated approach to nitrogen (PAS, 'programmatische aanpak stikstof')
- Module 6: Climate
  - Module 6A: Energy
- Module 7: Water
  - Module 7A: Integrated Pest Management (IPM)
  - Module 7B: Water Framework Directive (KRW, 'kaderrichtlijn water')
- Module 8: Soil
- Module 9: Safety at work
- Module 10: Processing of primary agricultural products

# **AKIS and advisory services in *Bulgaria***

## **Report for the AKIS inventory (Task 1.2) of the i2connect project**

***Date: January, 2021***

**Authors:**

Ivanka Todorova

National Agricultural Advisory Service

Contact: itodorova@naas.government.bg

Project funded under the Horizon 2020 Research and Innovation Programme under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION 'HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

The main aim of the report is to provide a comprehensive description of the Agricultural Knowledge and Information System (AKIS) in the Republic of Bulgaria, with a particular focus on agricultural advisory services. The description includes history, policy, funding, advisory methods and a section on how the Farm Advisory System (FAS) was implemented.

This report represents an output of the i2connect project (Connecting advisers to boost interactive innovation in agriculture and forestry, Project funded under the Horizon 2020 Research and Innovation Programme, Grant Agreement number 863039).

The different actors in the AKIS contribute in different ways to the management and financing, to the initiation, creation, dissemination and implementation of knowledge and innovation in the agricultural industry. In modern conditions, the traditional "linear" model (from science to farm advisory and training) increasingly requires the application of a new model in which interested agents form different types (sectoral, regional, national, transnational) systems for "joint" creating and sharing knowledge and innovation to address the diverse needs of farmers, rural communities and food chain actors. Along with this, various hybrid structures are developing between academic, business, non-governmental, public, and international and others organizations and agents for creation, dissemination, implementation and wide commercialization of knowledge and innovations in branch, interbranch, territorial and transnational scale (MAFF 2020).

The AKIS in Bulgaria is constituted by the following actors in public sector, private advisory sector, research and education, farmer based organizations and NGOs, etc. In the last 5 years the farmers' organizations have started to play an active role.

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## Abbreviations

<b>Acronym</b>	<b>Explanation</b>
AA	Agricultural Academy
AICs	Agro-Industrial Complexes
AKIS	Agricultural Knowledge and Information Systems
AMS	Agricultural Municipal Services
CAP	Common Agricultural Policy
ESU	European size units
EFA	Executive Forest Agency
FAS	Farm Advisory System
FBO	Farmer-Based Organization
LSU	Livestock unit
MAFF	Ministry of Agriculture, Food and Forestry
NAAS	National Agricultural Advisory Services
NGOs	Non-government organizations
POs/PGs	Producer Organizations / Producer Organizations
RAAS	Regional Agricultural Advisory Services
RDP	Rural Development Programme
UAA	Utilised Agricultural Area

## 1. Main structural characteristics of the agricultural and forestry sector

Bulgaria is located in South-East Europe. The country is divided into 6 planning regions (NUTS 2), 28 administrative regions (NUTS 3) and 264 municipalities (LAU 1). The population of the country, in 2019, was 6 951 482 (NSI, 2019). The percentage of rural areas in Bulgaria is 81% of the whole territory or 88% of the total number of Bulgarian municipalities (RDP, 2014). In 2012, agricultural land in the rural area was 54% of land area (RDR, 2014). The share of the population in rural areas is 37% of the population of Bulgaria (RDR 2014). 73% of the total arable land is privately owned, 22% is owned by municipalities and 5% is state property (RDP, 2014).

Agriculture's contribution to employment in Bulgaria is 6.26% for 2017 (MAFF, 2017 and 2018). GDP per capita for Bulgaria is EUR 7 876.15 per inhabitant (Eurostat, 2019), as the contribution of the Agrarian sector is (agriculture, forestry and fisheries) - 3.9%.

In Bulgaria, land for agriculture purpose is 5 021 412 ha, or around 45.2% of the territory of the country (MAF 2018). The Utilized Agricultural Area (UAA) is composed of arable land, perennial crops, permanent grassland, family gardens and greenhouse area. Arable land is 3 480 991 ha or 69.3% of the UAA, permanent grassland - 140 966 ha or 5.6%, vineyards - 52 517 ha or 3.1%.

The total number of agricultural holdings is 201 014, which cultivates 3 795 534 ha with an average UAA per holding of around 20.58 ha.

Distribution of the holdings (MAFF, 2016) is as follows: agricultural holdings under 2 000 limits in EUR are 104 898; between 2000- 8000 are 57 911; between 8 000 and 50 000 are 28 669; between 50,000 and 1,000,000 limits are 3 967 and over 100,000 are 5 569 numbers. Specialized farms a relative share of the total number of holdings 73.5%, mixed holdings- 26.2%, non-classified holdings 0.3%

Distribution of the holdings in ha is as follows: agricultural holdings under 2 ha are 129 912; between 2 ha and 10 ha are 29 741; between 10 and 50 ha are 15 343; and over 50 ha are 9 452. Farms and the animals kept in them - 54 376, 584 177 animals.

Therefore, in Bulgaria there is a strong polarization: there are many small-scale farmers with under 2 ha, 64.62% of the total agricultural holdings, who cultivate

only around 1.8% of total UAA and a small number of large-scale farmers with over 50 ha, 4.7% who cultivate 85.22% of UAA.

The number of holdings by age (MAFF, 2013) of manager is as follows: there are 14 307 under 35 years old; 144 514 between 35 and 64 years; and 93 331 over 65 years. 22.40% of the total numbers are women.

Labor force (persons and Labor in annual working units (AWU) in 2013 are 557 408 number person, what produce 298 382 AWU, divide by legal status of the holding: Natural persons 504 541 as number/ 250 180; companies and sole traders 52 867/48202 (MAFF, 2013)

Persons working on the holding by family relationship with the holder in 2013 – 557 408, family farms - 89.64% in family farms.

The total area of the forest territories at the end of 2018 amounts to 4 257 200 ha, or 38.35% of the land area of the whole country, of which 3,893,396 ha are forested areas (including dwarf 23 882 ha) (MAFF).

The distribution by type of ownership is as follows: 72.6% - state forest territories; 13.1% - municipal forest territories, 10.0% - property of private individuals, 1.1% - property of legal entities.

The total afforested area in 2018 is 3 893,396 ha, as the afforested areas with coniferous forests cover territories of 1 122 113 ha, and those with deciduous forests - 2,771,283 ha.

## 2. Characteristics of AKIS

### 2.1. AKIS description

The Agricultural Knowledge and Information System (AKIS) of the country consists of diverse and numerous organizations involved in the process of generating, sharing, disseminating and implementing knowledge and innovation in the industry. In addition to the different types of farmers and agricultural holdings, this complex system includes research institutes, universities and schools, agricultural advisory services, private consultants, specialized consulting, training and innovation companies, professional farmers' organizations, NGOs, suppliers of machinery, chemicals and innovations, food chains, processors and exporters of agricultural products, government agencies, local authorities, non-governmental organizations and interest groups, media of various kinds, international organizations, individuals, etc., and so on also various formal and informal organizations (partnerships, networks, associations, etc.) between them (MAFF, 2020).

#### 2.1.1. AKIS actors and knowledge flows

The different participants in the AKIS contribute in different ways to the management and financing, to the initiation, creation, dissemination and implementation of knowledge and innovation in the industry. In modern conditions, the traditional "linear" model (from science to farm advisory and training) increasingly requires the application of a new model in which interested agents form different types (sectoral, regional, national, transnational) systems for "joint" creating and sharing knowledge and innovation to address the diverse needs of farmers, rural communities and food chain actors. Along with this, various hybrid structures are developing between academic, business, non-governmental, public, international and others. organizations and agents for creation, dissemination, implementation and wide commercialization of knowledge and innovations in branch, interbranch, territorial and transnational scale(MAFF, 2020).

The AKIS in Bulgaria is constituted by the following actors in public sector, private advisory sector, research and education, farmer based organizations and NGOs, etc.

**PUBLIC SECTOR** includes following institutions responsible for capacity development in the agricultural sector:

**Ministry of Agriculture, Food and Forestry (MAFF)** is the main state organization that mainly works for implementing national agricultural and forestry policy, and Common Agricultural Policy (CAP). The MAFF has strong linkages with its secondary state organizations as Regional Directorates "Agriculture", National Agricultural Advisory Services, Executive Forest Agency and Agricultural Academy, and also with farm organizations and NGOs and weaker linkage with the universities and private sectors.

**Regional Directorates of Agriculture and their units at the municipal level** (28 Regional Directorate at the district level and 234 Agricultural Municipal Services at municipal level) are specialized territorial administration units and secondary administrators at the MAF. Their aims are to implement state policy in the field of agriculture, to provide information to the farmers, to provide statistical data and annual reports of the agriculture in the regional levels, to create system for registered farms for direct payments, to register farmers, etc. The employees of the Regional Directorates of Agriculture also take part in the seminars, events, trainings and demonstrations in order to acquire knowledge about the interventions in the Strategic Plan and increase their capacity for more efficient service to farmers and dissemination of knowledge and information. They have strong, direct contacts with farmers as well as with other regional units of MAFF.

**Executive Forest Agency (EAF)** implements the state policy and control of the national legislation in the field of management and protection of forests and forest resources in Bulgaria. The Agency supports the development, elaboration and coordinates the implementation of the main strategic documents for the development of the forest sector - the National Strategy and the Strategic Plan. The activities that are carried out are for sustainable management and use of forests and game in Bulgaria, proper planning and implementation of the planned activities. The Agency coordinates and controls the protection and preservation of forests, carries out state control over the hunting activities in the country, the implementation of forestry and hunting legislation. The EAF has 16 regional forest directorates, which perform the functions of the Agency in their designated areas of activity. 11 are the directorates of nature parks, which develop annual plans for the activities for protection and restoration of the biological diversity, maintenance and development of the tourist infrastructure, educational programs

and others in accordance with the plans for management of the natural parks. Specialized territorial units at the EFA are also 3 forest protection stations and 2 forest seed control stations. The policy implemented by the Agency, its structures and specialized territorial units, goals, activities and tasks are aimed at preserving, improving the condition, increasing forest resources, for the sustainable implementation of social, economic and environmental functions of forests. 6 state-owned enterprises have also been established, which carry out economic activity in the forests. The state forest enterprises are managed by a management board and are under the control of the MAFF.

**National Agricultural Advisory Services (NAAS)** is the secondary administrator at the MAFF. The main office is legal entities funded with headquarters in Sofia and 27 regional offices in the country. The NAAS has provided advisory services, laboratory chemical service and technical assistance to farmers for implementing efficient and competitive agricultural practices in Bulgaria since 2000. The main mission of the NAAS is supporting the implementation of the state policy in the agricultural sector and achieving the MAFF priorities and objectives for implementation of efficient and competitive agriculture in Bulgaria. In 2007, Centre for Vocational Education at NAAS was established. Its aim was to provide a wide range of long and short term training activities in agriculture (in-depth theoretical and practical knowledge) to farmers and to make them acquainted with the latest development in agriculture. Regional offices support the transfer and application of scientific and practical achievements in the field of agriculture; providing specialised consulting in the field of agriculture; organising and conducting training for farmers; assisting by providing information; and providing a set of advisory services to individuals under the conditions and requirements of the RDP Measures. The regional offices, often, cooperate with government and non-government organizations in the field of agriculture for information, knowledge and organization of the common events science. The budget of NAAS includes: subsidy; own revenues; donations; grants; revenue of training and information activities; consulting services and funds received by international projects and programs. NAAS is and will continue to be a major provider of advisory and consulting services at the district and municipal level with strong and lasting ties with the MAFF, as well as with scientific and academic organizations and farmers. NAAS is the only participant in AKIS that has expertise for knowledge transfer, maintaining the quality and capacity of its experts.

**AGRICULTURAL RESEARCH AND EDUCATION** includes the Agricultural Academy with their Regional Research Institutes and Experimental Stations, Agricultural Universities/ higher education institutions and vocational high schools.

**Agricultural Academy (AA)** is an autonomous budget organization in the frame of MAFF for research, service and support activities in the field of agriculture, animal husbandry and food industry. 25 Regional Scientific Institutes Scientific institutes carry out basic research, applied research, innovation and consulting in the field of agriculture and food. 4 State Enterprise "Research and Production Center" carries out scientific-applied, applied, experimental-production and other activities supporting the activities of the Academy. 1 State Enterprise "Research and Production Center", unites 3 experimental stations, carries out scientific-applied, applied, experimental-production and other activities supporting the activities of the Academy. There is also 1 training center established to the AA. The AA, through the established network of institutes, centers and pilot stations, actively participates in information and discussion events organized by the NAAS and the CAP network, within which it offers solutions through scientific methods to problems identified in practice. The AA structures are a potential main player in the operational groups within the EPI participating in the search for technological solutions to address the identified needs of farmers. Strong links with MAFWE and NAAS, as well as direct contacts with farmers' associations and farmers. Strong links with MAFO and NAAS, as well as direct contacts with farmers' associations and farmers. The budget of research institutes includes state subsidy; revenue from research projects; revenue from advisory services; revenue from intellectual products; and others.

**The universities** mainly provide education and training to students at Bachelor, Master and Doctoral levels. There are 5 main agricultural universities in Bulgaria: Agricultural University, Trakia University, University of Forestry, Ruse University; and University of Food Technology. They offer agricultural knowledge and education in the field of crop and animal production, plant protection, farm machinery, agro-ecology, agricultural economics, food technologies, etc. Their functions in AKIS are aimed at developing and creating and implementing innovations, providing training and consultations for farmers and foresters. Universities are a major incubator of new knowledge through their units and specialists engaged in research and development in the field of agriculture and food. At this stage they have established links with MAFF, NAAS, as well as direct communication with farmers' associations and farmers.

**Vocational high schools** in the field of agriculture and forestry are participants in AKIS, whose functions are aimed at providing training for farmers and foresters.

**FARMER BASED ORGANIZATIONS** includes farmers' branch organizations, farmers' cooperative, farmers' organizations/ groups.

**Branch organizations** (non-profit legal entities in the field of agriculture and digital technologies) amount to 32 and their names and websites, officially, are posted in the MAFF's website. These organisations represent different sectors (e.g. milk, meat, fruits, vegetables, crop productions, etc.). Their aims are to protect the members' interests, to provide assistance to their activities and to resolve the actual problems of their members in the field of the agriculture. They have effective partnership with all institutions and organizations related to the agricultural sector. The associations work closely with the MAFF. In recent years, they have established themselves as a specific channel for information exchange in two main areas: disseminating information to their members about the opportunities and requirements for applying for support schemes and measures; feedback to the MAFF on the basic needs and problems that farmers face in the process of development of their farms, as well as when applying for support schemes and measures. Many of the branch organizations hold annual seminars for their members, to which they invite both representatives of the administration and other participants in AKIS. These seminars have established themselves as a natural channel for the dissemination of knowledge and information that can be supported and upgraded. Branch associations in the field of information technology should also join this group. They help to disseminate information about the possibilities and advantages of information technology. With the help of these branch associations, the establishment of new connections between information technology providers and agricultural producers is encouraged, as well as the finding of new opportunities for application of information technologies in the agricultural sector.

**Production cooperatives** are common structures in the country. Officially, 225 are entered in the register of cooperatives. They work the land of their members. Often, their annual income does allow them to re-invest in machinery and equipment, to use new seeds, varieties, to restore livestock stables, etc. ***The National Union of Agricultural Cooperatives*** in Bulgaria is a national voluntary organization uniting regional, regional, branch and cooperative unions and organizations. The member agricultural cooperatives are united on a territorial

basis in 19 regional and regional unions of agricultural cooperatives. The goal of the national union is to build and develop modern agricultural cooperatives, to protect and effectively use the agricultural resources of Bulgaria. The national union and its regional structures periodically hold courses and seminars on current issues in order to raise awareness and qualification of staff in agricultural cooperatives. This activity is carried out by attracting highly qualified lecturers from the MAFF, agricultural institutes and universities.

**Farmers' organizations/ groups (FOs/FGs)** are still not common in Bulgaria. So far, in the country, there are 77 producer organization/ groups (MAFF, 2019). Some of them received financial support by RDR. The maximum aid intensity is 100% and the aid is decreasing. Financial assistance shall take the form of a fixed annual payment granted for no more than five consecutive years from the date on which the producer group or organization is recognized. The amount of aid for each producer group or organization shall not exceed EUR 100 000 for each year. Each group has minimum four members - both small and large agricultural producers. Their main activities are (1) Adaptation to the market requirements of the production and production of the members of such groups or organizations; (2) Joint marketing of goods, including preparation for sales, centralization of sales and deliveries to wholesale buyers; (3) Establishing general rules for production information, in particular for harvesting and stocks; (4) Other activities that can be carried out by producer groups and organizations, such as building skills for business and trade and organizing and facilitating innovation processes. FO/Gs work intensively with public sector (MAFF, NAAS), private advisory services and private companies providing inputs.

**OTHER NON-GOVERNMENT ORGANISATIONS (NGOs)** are also not common in Bulgarian agriculture but where they do exist they are well-known among agricultural producers as organizations working professionally with them. They, usually, keep their employers up to date with the new innovations, methods and knowledge related to the agricultural production and all state and EU programs running in the country. They organize practical training courses for partners (e.g. NAAS) and interested farmers, agronomists, etc. NGOs.

**The foundations** in agricultural sector in Bulgaria are non-profit organizations too. There are not so many in the country. Mostly, they work for supporting and helping small scale farmers, landless and poor Roma families (e.g. Land-source of income) and specific sectors such as organic farming (e.g. Agrolink, Bioselena).

They focus their activities on consulting their target groups, creation and realization projects that support small-scale farmers. They educate and technical consult agricultural best practice in areas with a mixed ethnic groups, and also, organize workshops and seminars - bringing together policy makers and practitioners at the local, national and international levels

**PRIVATE ADVISORY SECTOR** includes private advisory companies, independent consultants, international trade organizations and regional suppliers. There are no exact information for their number and topic.

**Private advisory companies** in Bulgaria have started their extension services in agriculture during the PHARE and SAPARD programs. They mainly provide information and prepare applications to their clients for different measures of the RDP and the operational programs.

**The independent consultants** are mostly people, who are former experts from MAAF' structure or educated persons, who work mainly with small scale farmers and prepare applications mostly for the measures of RDP. Mostly, their clients are famers, who they know personally and are recommended by people who have already used their services.

**International trade organizations** are important providers of information regarding new technologies and marketing of the agricultural sector. These organizations are mainly seed companies, plant protection companies, machinery dealers, etc. Their extension services to farmers mainly relate to plant protection, machinery use and agricultural production.

**Regional suppliers (trade organizations)** are mostly input suppliers with well-established networks with farmers. They usually provide advice on plant protection, sanitary and soil fertility measures at each particular situation in the farm. Such local trade organizations are agri-chemical shops and distributors, who work mostly with farmers on regional level. They benefit from well-developed chemicals industry in the country.

At least but no last **National Rural Network (NRN)** / NRN Management Unit exchanges experience, knowledge and good practices for rural development from Bulgaria and other EU member states. The unit performs functions of creating and strengthening the links between farmers, industry associations, administration, NAAS, universities, vocational schools, organizations, researchers and other

participants in innovation in agriculture and rural development at the national level. The unit encourages interaction between all stakeholders in the knowledge building process and will support the implementation of innovations. These functions are performed through a developed regional structure at the district or municipal level, which aims to cover the majority of farmers through the established links at the local level and knowledge of specific channels for dissemination of information among local communities. The exchange of information and knowledge is also based on a bottom-up approach by organizing information events to share good practices on request from CAP network participants.

**Private training organizations**, performing functions for raising the professional qualification of entrepreneurs and employees in agriculture to deal with new challenges, such as dealing with climate change, new environmentally friendly production methods, digital technologies and innovations.

**Municipal Forests Association.** Municipalities - owners of forest territories, are aware of the need and benefit of creating management potential and structures for forest management, in accordance with the requirements of the Forest Act and the Municipal Property Act. The association has 59 member municipalities.

### 2.1.2. Policy framework at national level

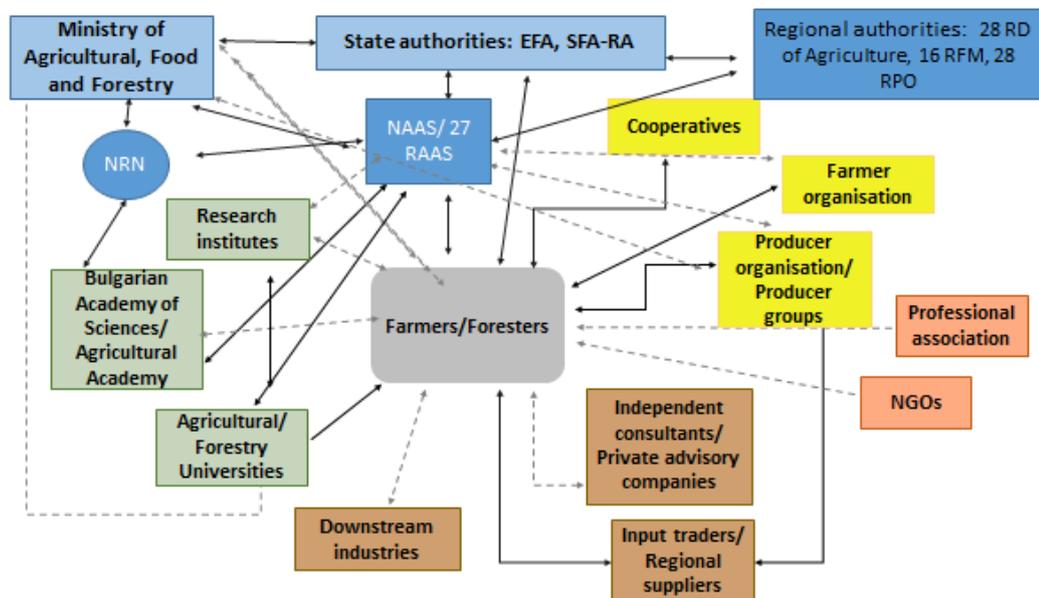
The **Minister of Agriculture, Food and Forestry** is a central sole body of the executive power that manages, coordinates and controls the implementation of the state policy in the field of agriculture, rural areas, forestry and hunting, fisheries and aquaculture and implements the state food safety policy compliance with applicable law. As a sole body of the executive power, the Minister determines the strategic goals and priorities of the policy in the agricultural sector, organizes and coordinates the development of strategies, plans and programs for their achievement and controls the implementation of the measures set in them, incl. conducts the policy of the state for development of the research, scientific-applied, experimental and production activity in the field of agriculture and food. The Minister organizes, coordinates and controls the activities related to the implementation of the Common Agricultural Policy (CAP), the Food Safety Policy and the Common Fisheries Policy (CFP) of the European Union (EU). The MAFF is an administration that assists the Minister of Agriculture, Food and Forestry in exercising his powers (MAFF, 2020).

An article 10 of the Law on Support for Agricultural Producers (Promoted in State Gazette №58/ 1998, last amendment State Gazette № 77 / 2018) provides the legal provisions and setting up of FAS system in Bulgaria. By establishing NAAS, Bulgarian government fulfills the obligations for existing, functioning and having access to farm advisory system in the country, in accordance with Art. 12 - Art. 15 of the of the Council No 1306/2013. The legal framework for advisory system and the implementation of the EU-FAS in Bulgaria includes several national regulations.

### 2.1.3. Coordination Structures

So far, there is no coordination structure for the functioning of AKIS. It is expected that with the adoption of the Strategic Plan for the next programming period a similar structure will be legitimized, similar to the National Rural Network - a coordination unit within the structure of the MAFF.

## 2.2. AKIS diagram



### 3. History of the advisory system

Before 1989, the Bulgarian agricultural knowledge system had a clear top-down structure. The agricultural sector was a part of the state-planned economy. It was large scale, modernised and organised into huge agricultural collective organisations, called Agro-Industrial Complexes - AICs (established in the 1968). Therefore, the agricultural consultancy activity was mostly informally organised and oriented to the technical aspects of production. Agricultural research was mainly carried out by universities and research institutes. Most of the research institutes dealing with agricultural issues were (and still are) part of the Agricultural Academy funded by MAFF.

After November 1989 until 2000 the objective of the agrarian policy was concentrated on land restitution under Bulgarian land law and privatization of the collective farm assets. After the privatisation, Bulgarian farms were structured by three groups: small scale farmers operated by people close to retirement, cooperatives, most of them with bad financial situations and large commercial farms. At this time, there were a number of cooperatives that were used as demonstration farms, with an objective of establishing private extension services. Since the experiment was not successful, the government decided to establish a National System of Agricultural Extension with external financial assistance (FAO, 2005). In 1995, the National System of Agricultural Extension was created by agreement between the National Centre for Agricultural Sciences (former name of the Agricultural Academy) and Ministry of Agriculture and Food. It was built with the technical and financial support of the PHARE Programme - Agriculture (in the framework of two projects) for the period 1995-1999.

Since 2000, the NAAS participated in several international projects, where some of them are designed to strengthen the capacity of the staff mainly in various aspects of the CAP: sustainable land management, rural development, development of organic farming, environmental protection and climate, developing strategies and management of agricultural organizations, etc. After the RDP 2007-2013 began to operate, NAAS started to provide services in the context of Measure 143 "Provision of farms advisory and extension services in Bulgaria and Romania. NAAS assists farmers with their applications for four measures (the setting up of young farmers, semi-subsistence farming, setting up producer groups and agro-environmental payments). During the RDR 2014-2020 NAAS continues assists farmers with their applications for several measures as well as supporting

the farmers to understand the EU rules for environment, public and animal health, animal welfare and the good agricultural and environmental condition (Measure 2 "Consultancy services, farm management services and farm replacement services"). Knowledge transfer activities continue and the NAAS provides the link between farmers and science. In addition to continuing to train farmers, NAAS emphasizes demonstration training, popularizes and promotes the involvement of farmers in thematic networks, and disseminates information on innovative technologies and practices for their implementation.

At the same time, many private advisory companies and professional farm associations were established. Private advisory companies mainly provided extension services to farmers regarding RDP measures and covered all other measures that have not been covered by NAAS. Professional farm associations mostly provided consultations to farmers regarding the legal framework in the sector, created links between their members and helped to find market for products produced by their members.

In conclusion, the AKIS in Bulgaria are represented mainly by the NAAS and research centres (public advisory provider), consultant organizations and farm associations (private advisory providers). NAAS mainly provided information and advisory services about "cross-compliance", measures related to climate and the environment and maintenance of the agricultural area, measures at farm level provided from the RDP, knowledge about water protection, water use and use of plant protection plants. The NAAS experts and scientific researchers (from the Agricultural Academy and Universities) provide mainly advices to small and middle scale farmers, while private advisory providers frequently work and provide consultations to large scale farms and to members to the farm associations.

However, at this stage, the above mention organisations do not have the capacity to cover the enormous amount of knowledge dissemination work and to meet the needs of access to information from numerous farmers. In this connection, it becomes obvious the need to coordinate and join the capacities and efforts of the regional and municipal services, universities and research institutes, as well as and the non-governmental sector, in the process of knowledge transfer and innovation in agricultural practice. The development of information and communication technologies may open new opportunities for dissemination of knowledge and good practices to the farmers.

## 4. The agricultural and forestry advisory service(s)

The information below describes the variations of the consultancy service providers in the country, indicating their approaches to service delivery, methods and management based on the results of a specific study conducted within the project. 25 consulting service providers were interviewed – 11 advisory organizations, 8 organisations with an advisory component and 6 freelance advisors.

In addition to the survey data, secondary data sources and results from expert interviews were used to enrich the results.

### 4.1. Overview of all service suppliers

The providers of consulting services in the country are mainly public and private, and in the last 5 years the farmers' organizations have started to play an active role.

Taking into account the predominant percentage of small farms and the need for young farmers to enter agriculture, the MAFF in 2020 established a public consulting organization – NAAS, covering the whole county through its 27 regional offices. To date, NAAS continues has been a major player in the provision of advisory services, strengthening its role and importance in the consulting services market. NAAS offers various consultations according to its program, including a comprehensive "package of consulting services" (from the establishment of the farm to its full service in agronomic, animal husbandry and agro-economic aspects), organizes and conducts trainings for farmers, disseminates useful information and good practices and supports the application for RDP projects. The NAAS supports the transfer of scientific and practical achievements in the field of agriculture and thus supports the links "research - agricultural business". All consultations provided by NAAS are free of charge for farmers, which help to effectively share knowledge and innovation in the industry. The target groups targeted by activities in recent years are mainly small and medium-sized farms, start-up and young farmers, new productions (organic production, organic, etc.), producer organizations, etc.

Other public providers of advisory services are the AA and agricultural universities in the role of research organization. Their main activity is related to the development and application of scientific and applied products/ technologies,

assessments and recommendations for the development of farms. Agricultural universities have an essential role in the education of farmers, incl. and upgrading training. Medium and large farms benefit from their services and in most cases the services are paid for unless they have used funds under national/ international projects and programs. Scientific institutes and universities provide knowledge mainly through training courses and seminars to farmers.

Although public advisory services exist, private advisory services also emerged due to increasing need of the farms to gain support from them through rural development measures. Their activities vary from writing applications for financial support to technical assistance. These private services are used mainly by large scale farmers. Non-government organizations (farmer associations and foundations) at the national and regional levels advise their members on farming and participating in different development measures. Repeatedly, they provide information for private advisory companies that can support farmers to prepare their applications within RDP measures. International trade organizations and regional suppliers, mainly, provide extension advices to farmers and farm organizations on issues related to agricultural production, plant protection and new machinery. They are important providers of new technologies and innovations for agricultural sectors.

## **4.2. Public policy, funding schemes, financing mechanisms, advisory service providers**

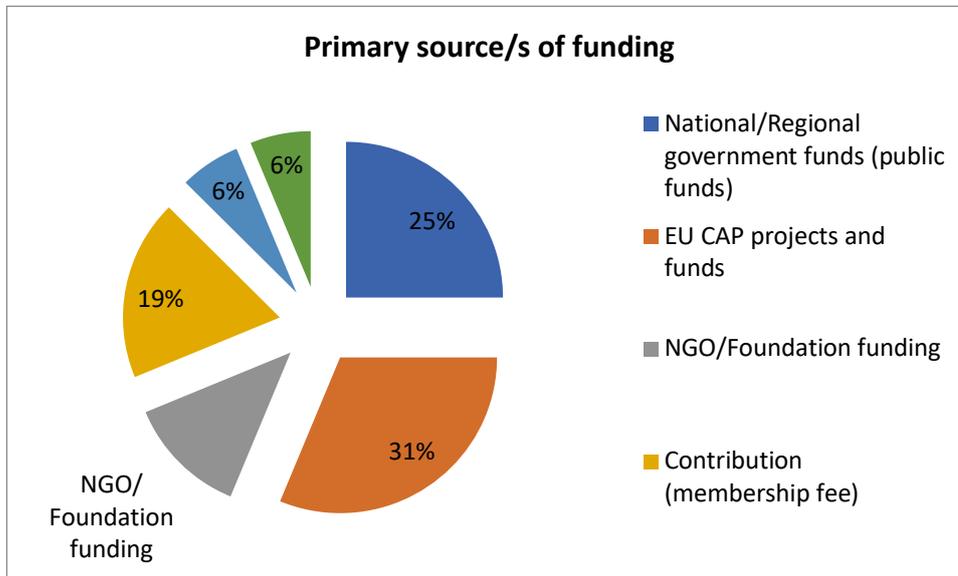
The sources of funding for advisory organizations depend on their type. For public organizations, the national budget is a significant part and is supplemented by funds for programs and projects, incl. and RDP.

For private advisory organizations the budget is formed by payment for the services provided, as well as by programs and projects, incl. and RDP.

The survey data show that the main share of funding for advisory services is from EU CAP projects and funds. Only 1/4 of the participants in the survey note that their budget has increased by more than 10% over the last 3 years, and the source is from implemented activities under programs and projects.

The main EU funding schemes for Bulgaria for the period 2007-2013/ 2014-2020 are: (1) the direct payments which are complimented by national payments, and (2), measures under the RDP. All these programs actively work for support farm

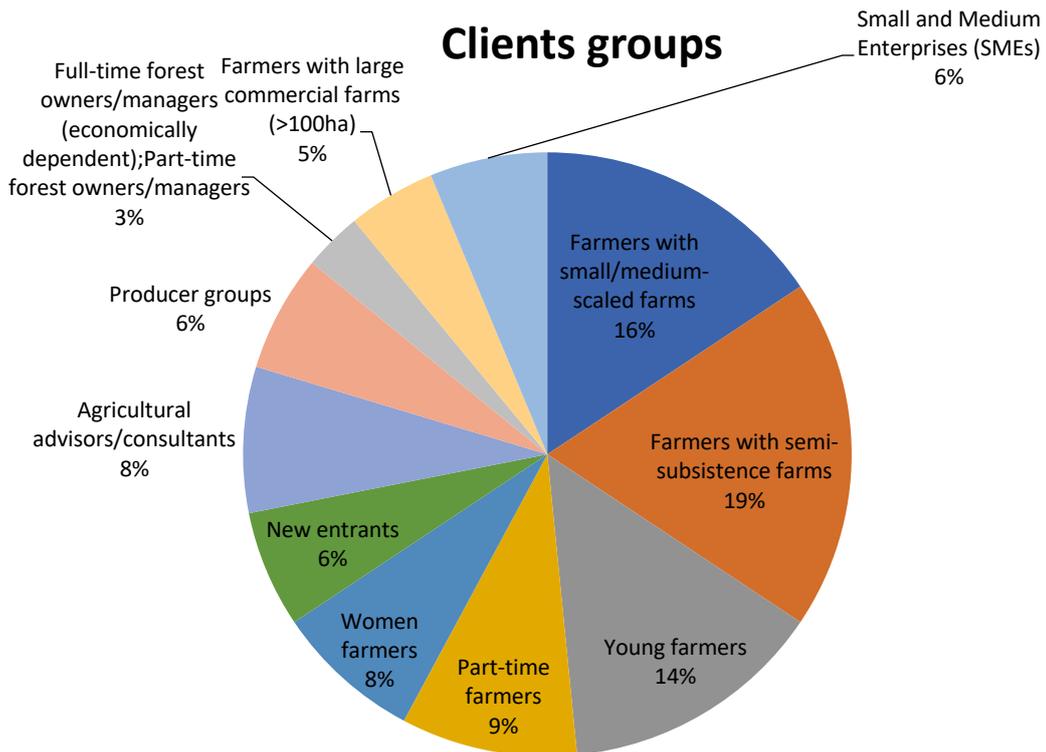
productions and their activities. The RDP has several components oriented towards advisory services - provision of consulting services and trainings.



### 4.3. Clients and topics and methods

Client target groups depend on the type of advisory organization. As repeatedly described above, the main public provider - NAAS, as well as some NGOs and freelance consultants provide advisory services mainly to small and medium-sized farms / enterprises, young farmers and start-up farms. The part that provides advisory services to large farms is insignificant, which does not mean that they do not need / do not use such services. The figure illustrates this condition clearly. The positive finding is that more and more actors state that they also participate in the training of consultants. These are AA, agricultural universities and institutes, incl. and private organizations (Institute for Agricultural Strategies and Innovations). At this stage, NAAS trains and upgrades the capacity of its consultants, and through its public activities (conferences, seminars, thematic networks, publications) it also contributes to increasing the capacity of others involved in this business. Confirmation that NAAS remains the main provider of advisory services is the number of farmers it serves annually - 18,000. The other actors do not have a permanent customer network. Main cross-cutting advisory topics which are most demanded by clients are: Entrepreneurship and farm management; Production technologies; Accounting/Bookkeeping; Tax and legal advice; Rural development support and diversification (farm/forest); Support with

grant application and compliance with regulation and standards; Agri-environmental stewardship measures and nature conservation. Only 4% of survey participants answered that advising farmers to adapt their farms to the cross-compliance requirements by EU-FAS.



Almost all indicate the basic methods most frequently used by their advisors are: Individual face to face advice on the farm/enterprise; Individual face to face advice outside the farm/enterprise (e.g. advisory office); Individual advice via telephone; Individual advice via digital apps (e.g. skype call, WhatsApp chat, telegram) and emails); Group advice via webinars; Group advice via demonstrations, exchange visits; Mass media advice via internet (information from websites, blogs, forums); Mass media advice via social media sites (e.g. twitter, facebook); Mass media advice via printed publications, TV, radio, newsletters. Over 90% of the

participants indicate that the most preferred and used methods are related to the provision of face-to-face / face-to-face advisory services on the farm (in person or on a demonstration basis). 5% indicate that the preferred services are through Individual advice via digital apps (e.g. skype call, WhatsApp chat, telegram) and emails) or via telephone or Mass media advice via the internet (information from websites, blogs, forums). Group advice via demonstrations, exchange visits or Group advice on the farm / enterprise also have a share of about 4%. Accurate statistics cannot be given, as only the NAAS keeps registers, and the survey lists and prioritizes mainly the above methods.

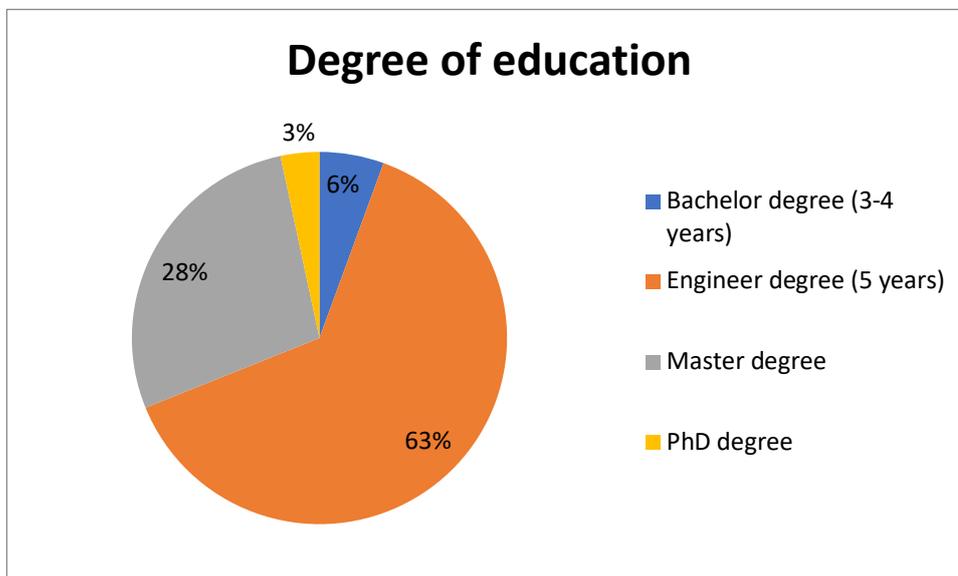
1/4 report that their organization outsources to external consultants certain advisory topics.

50% have changed their methods of consulting due to the COVID-19 pandemic, reducing face-to-face consultations and switching to remote methods - internet, telephone, platforms.

#### **4.4. Human resources and methods of service provision**

Most organizations report that there has been no change in their numbers in recent years, with the exception of 1 participant (AA), where there has been a sharp decline in staff numbers. Organizations that deal only with advisory activities, the percentage of advisors is over 80%. In organizations that also perform advisory activities, e.g. agricultural universities and institutes, the number of advisers is less than 20%. In the private sector, extension staff numbers are small (often not more than 5 full-time employees) and when they need special advisory consultations they employ a person or persons part-time to provide such special services. The predominant counselors are women. Only 4 participants in the survey indicated that they have human resources dedicated to the back-office activities.

The educational level of those employed in advisory activities is mainly engineer degree (5 years) or master degree, incl. and the freelancers. 2/3 of the advisors in NAAS have over 10 years and almost 1/3 with over 5 years of professional experience. Advisory organizations do not require special certificates for their consultants, only NAAS trains and issues advisory certification for its consultants for CC-compliance.

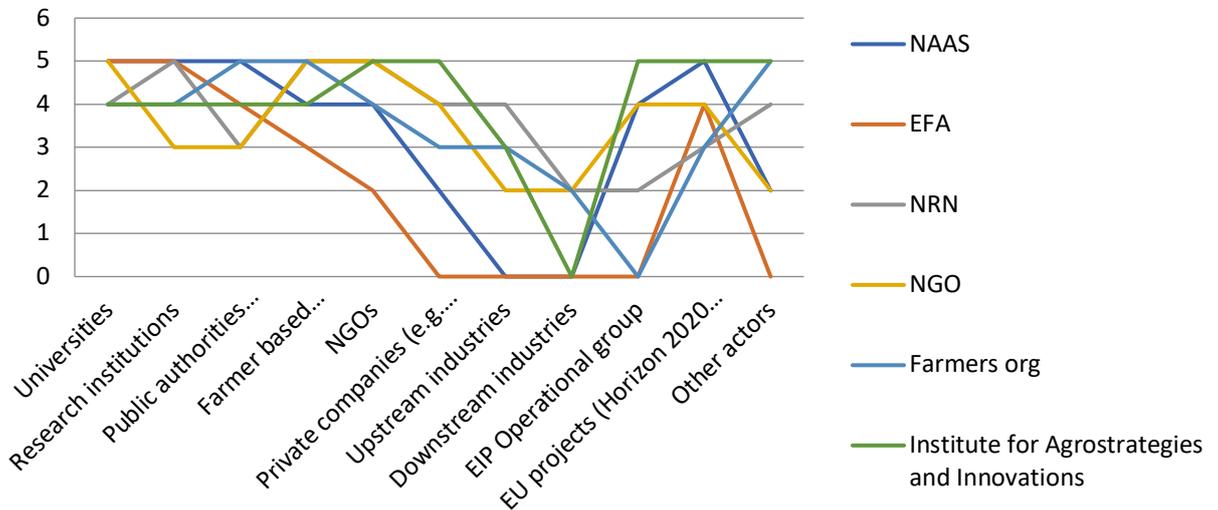


#### 4.5. Linkages with other AKIS actors/knowledge flows

AKIS actors cooperate and exchange knowledge / information to varying degrees. While public organizations, incl. and NAAS, have established lasting and strong links with universities and institutes, then in NGOs these links are not so visible. Freelance consultants rely primarily on connections established during their educational period or established during conferences and other events.

In connection with the ongoing knowledge transfer activities, NAAS has written framework agreements for cooperation with agricultural universities, institutes, associations and other participants in the process.

### Degree of cooperation with various actors (1-5, 5-strong)



In recent years, the MAFF has tried to initiate a process of regulating the relations between the individual actors, but there are still no visible results. In the coming years, this will be the task of the MAFF as a coordinate unit for AKIS.

#### 4.6. Programming and planning of advisory work

Only NAAS has a staff development strategy/plan. The NAAS keeps a record of advisors work of their staff through timesheets, financial indicators and farm performance evaluation. Since 2011 NAAS has started to operate an information system that connects all 27 RAAS with the central office under strict access rules, data sharing and security. There are three system modules - extension, training and administration.

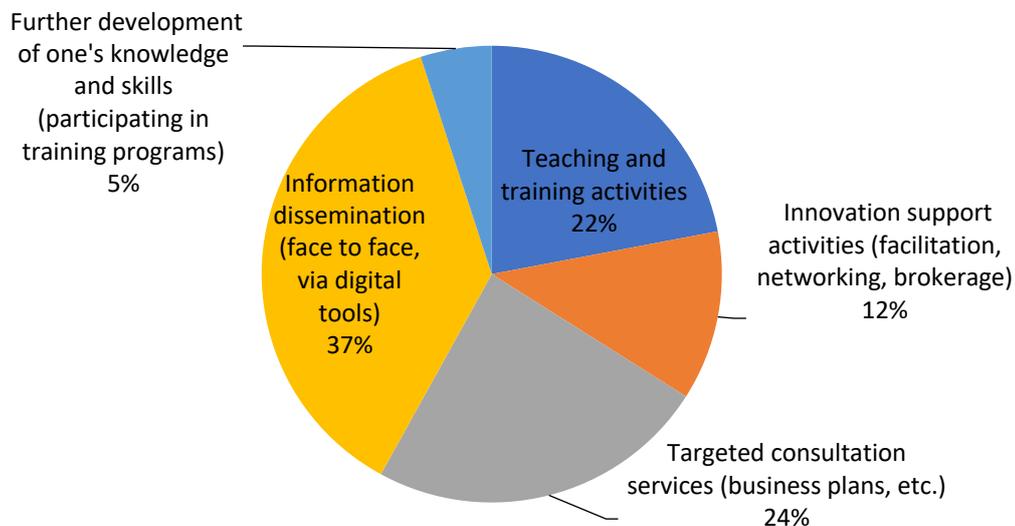
The NAAS is planning its work on the basis of an annual plan and programme for each RAAS. However, often the monthly schedule of RAAS is changed because of e.g. a new campaign for assisting applications to certain development measures, for visiting seminars or training courses, etc. Changes in the regulatory framework, specialized training in plant and animal husbandry, agroecology and climate are subject to upgrading training programs. NAAS has a licensed training center, which is used not only for training farmers, but also for training its consultants. On average, each NAAS consultant spends 8 days a year on upgrading training. Mechanisms to reward good performance and incentivize skill developments for

advisors also function in the NAAS, which is related to additional incentives / remuneration according to the achieved results.

Within the private extension providers, there is not so much information about the planning of their advisory work. So far, non-government organisations rely on external funding (international donors), and for that reason, do not have a sustainable strategy.

The graph below shows the average time that consultants spend in the work process. Of course, there are differences between different groups of advisory organizations, e.g. In universities, almost 80% of the activity is related to training, while at the NAAS 80% the activity is related to providing consultations and preparing business plans for farmers. Freelance consultants mainly prepare business plans for farmers and do not conduct trainings.

### Aggregate time spent on activities



## 4.7. Advisory organizations forming the FAS and evaluation of their FAS implementation

The European Union-Farm Advisory System (EU-FAS) must ensure that farmers have access to advisory services and understand the European Union rules for implementing good agricultural and environmental practices. In Bulgaria, advisory services are provided by public body –NAAS and private advisory providers. The

major role of the NAAS is to provide advisory services to farmers (especially for small agricultural holdings). Therefore, the NAAS as a public body fulfils the obligations of Bulgaria to exist and to access a system for farm consultations, according with Art 12 and Art 15 of Council regulation 1306/2013. The NAAS is a main representative of the advisory system in Bulgaria and takes the biggest share in advisory system in Bulgaria compare with private advisory providers and scientific organizations in the country.

The EU-FAS in Bulgaria is widely understood as an agricultural advisory system mainly carried out by the NAAS at the national level and their regional agricultural advisory offices in Bulgaria, which provide advisory services according the general EU requirements. This is a fact because the NAAS has already participated in many activities including those formulated in the EU-FAS objectives. At the regional level (NUTS3), the EU-FAS, in Bulgaria, is represented by 27 regional agricultural advisory offices (RAAS). Those regional offices are part of the NAAS structure. The system is certificated, coordinated and controlled by the MAFF. The region advisory offices offer horizontal services to all farmers. The advisory services from RAAS are available to all farmers in the over the country eligible for support the CAP.

The EU-FAS in Bulgaria need to guaranty those farmers has access to advisory services and receive information and support on the base of their specific needs. In addition, the EU-FAS in Bulgaria have obligations to provide information about the statutory management requirements and the standards for good agricultural and environmental conditions (“cross-compliance”) and agricultural practices for the climate and the environment and maintenance of the agricultural land (“greening”). The EU-FAS in the country follows the measures from both the RDP such as farm modernization, competitiveness building, sectorial integration, innovation and market orientation, promotion of entrepreneurship and, also, measures related to water protection, efficient and sustainable water use of plant protection products, integrated pest management, etc.

An article 10 of the Law on Support for Agricultural Producers (Promoted in State Gazette №58/ 1998, last amendment State Gazette № 77 / 2018) provides the legal provisions and setting up of FAS system in Bulgaria. By establishing NAAS, Bulgarian government fulfills the obligations for existing, functioning and having access to farm advisory system in the country, in accordance with Art. 12 - Art. 15 of the Council No 1306/2013. The legal framework for advisory system and the

implementation of the EU-FAS in Bulgaria includes several national regulations. These regulations are: Law on the Agricultural Academy, and in particular Article 1, defining, establishing and functioning of the National Agricultural Advisory Services; Bulgarian Law for supporting agricultural producers (Article 10 in Farm Support Act); Law on Agricultural Academy and several Regulation for RDP implementation.

## 5. Summary and conclusions

### 5.1. Summary and conclusions on sections 1 – 3

The AKIS in Bulgaria brings together a wide range of stakeholders, actively interacting with each other in order to increase the level of education and awareness of farmers and foresters and unlock and develop the potential for innovation in practice.

The main goal of AKIS in Bulgaria is to overcome the big difference between science and practice and to make science even more beneficial for agriculture by facilitating the transfer of scientific knowledge in practice.

The development of the AKIS in Bulgaria is aimed at:

- 1) Dissemination of knowledge and innovation, which play a crucial role in helping farmers and rural communities to meet the challenges now and in the future;
- 2) Institutions responsible for agricultural policy, farmers, researchers, advisers, agricultural and industry associations and the media to join forces to support the development of new knowledge and innovative solutions in the field of agriculture;
- 3) Creating an enabling environment for the more effective dissemination and implementation of innovations and for the better use of existing knowledge to achieve the objectives of the Common Agricultural Policy;
- 4) Close cooperation with the European Innovation Partnership for Agricultural Productivity and Sustainability (EMI-AGRI) to support interactive innovative projects at local and transnational level;
- 5) Stimulation, development and development of innovative projects and dissemination, use and widest possible application of their results.

The main actors in the AKIS: Ministry of Agriculture, Food and Forestry; Regional Directorates of Agriculture and their units at the municipal level; National Agricultural Advisory Service; Agricultural Academy; Higher education institutions; Vocational high schools in the field of agriculture and forestry; Private training organizations; Branch organizations, incl. in the field of digitalization; Farmers,

incl. producer groups/ organizations; Processing enterprises in the field of food; Forest managers; National Rural Network/ CAP Network Management Unit; Task Forces within the European Innovation Partnership; Others.

## 5.2. Summary and conclusions on sections 4

Successful actions to develop and strengthen the AKIS include the following main groups:

*Facilitating the development and creation of innovations, incl. improving interactive innovation; and strengthening the links between research and practice.*

It is essential for the development and creation of innovations to stimulate and support this process, as well as the free sharing of pre-existing knowledge in an accessible way for all participants in the AKIS at national and regional level. Existing knowledge can be used as a basis for innovation. The stimulation of interactive (systemic) innovations is very important, because in them the process is "bottom-up" and accordingly they arise from the practice and the needs of agricultural and forestry and processing enterprises. They are generated on the basis of good relations and cooperation between scientific organizations on the one hand and farmers and foresters, processing companies and their organizations on the other. Advisory organizations also play an important role in facilitating this cooperation. Innovations created with an interactive approach often provide more targeted solutions that are easier to implement, as the process is conducive to accelerating the introduction and adoption of new ideas. The process can be stimulated through the intervention to support the creation of operational groups within the European Innovation Partnership (Article 71 (a)).

*Supporting the transfer of knowledge and innovation, strengthening all advisory services in agriculture and promoting their interconnection within the AKIS.*

It is essential for the transfer of knowledge and innovation from science in practice that the easy and free sharing of knowledge in an accessible way is accessible to all participants in the AKIS at national and regional level, all of whom must be involved in this process create a well-structured and functioning innovation system. Promoting collaborative action, building sharing skills and increasing effective cooperation is a key element of success in putting innovation into practice. Formal cooperation will grow effectively when each participant,

depending on skills and expertise, will be indispensable in the development and implementation of innovations. The experience gained so far through the implementation of the RDP 2007-2013 and 2014-2020 and by EPI-AGRI show that success depends mostly on active cooperation between scientific organizations (AA and agricultural universities) organizations providing advice in the field of agriculture. and rural areas (NAAS and others) and branch and other non-governmental organizations in the field of agriculture.

The NAAS and other agricultural advisory organizations under the FAS are one of the main sources of information for farmers' decision-making. The efficiency and effectiveness of advisory services can best be enhanced by improving their links within the AKIS and by sharing knowledge and innovative applications more widely. Counselors need to have access to the latest knowledge by constantly upgrading their interactive and digital skills. Their role is important for disseminating the knowledge and results of projects to their clients and beyond.

*Supporting the transition to digitalization in agriculture.*

Agriculture and rural areas change significantly by increasing the use of modern technologies, accompanied by intelligent devices with autonomous behavior and connectivity. Many farmers may not be able to keep up with new technologies, so having an impartial consulting service with sufficient digital knowledge and access to data is very important in order to minimize the digital divide and make better use of digital technologies. The future role of agricultural advisory services should include facilitating innovative projects in the field of digital technologies, as well as supporting farmers to navigate the digital world.

*Support and assistance for the successful implementation of projects under the Horizon 2020 program and the Horizon Europe program.*

## **6. Acknowledgement of partners, information sources and gaps**

This national report builds on the prepared “AKIS and advisory services in Bulgaria Report for the AKIS inventory” of the PRO AKIS project. The national report is based on several semi-structured interviews with experts from different key organizations and a survey conducted with different extension providers.

The main sources of information used for its preparation are Report “Analysis of the state of agriculture and food taste industry”, prepared by the Institute for Agrarian Research on behalf of the MAFF in connection with the development of the Strategic Plan.

I would like to say a special gratitude to my colleagues of NAAS, MAFF, RFA, who have done wonderful work sending and collecting information. Also, I am grateful to all experts who participate in the semi-structured interviews and those who took part in survey.

The epidemiological emergency and the covid measures introduced did not allow for extensive and face-to-face interviews, which probably affected the final quality of the report.

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FAS: [http://ec.europa.eu/agriculture/direct-support/cross-compliance/farm-advisory-system/index\\_en.htm](http://ec.europa.eu/agriculture/direct-support/cross-compliance/farm-advisory-system/index_en.htm)

MAFF: <http://www.mzh.government.bg/mzh/Home.aspx>

SFA: [http://www.dfz.bg/en/certificates\\_en/](http://www.dfz.bg/en/certificates_en/)

NAAS: <http://www.naas.government.bg/en>

NSI: <http://www.nsi.bg/>

## Appendices

Table 1. List of AKIS institutions (names, address, website)

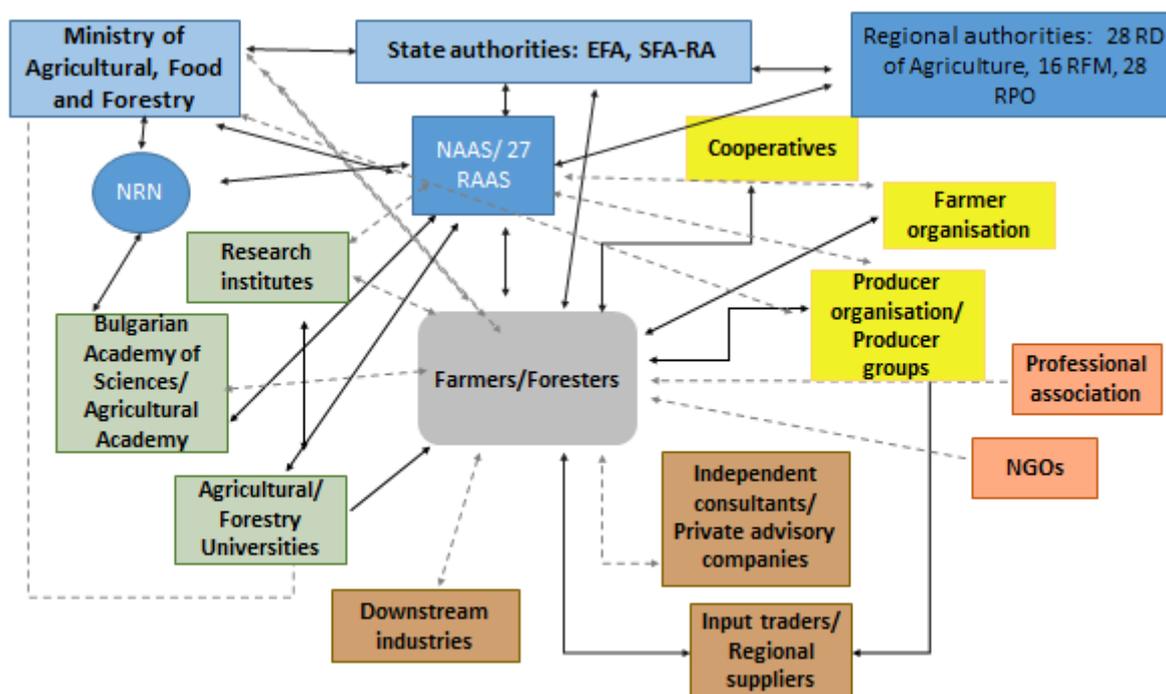
Name of institutions	Address	Website	Status (public/R&E/private/FBO/NGO)*
<b>Ministry of Agriculture and Food</b> with 28 Regional Directorates and 234 Agricultural Municipal Services	55, Hristo Botev Blvd., Sofia	<a href="http://www.mzh.government.bg/MZH/en/Home.aspx">http://www.mzh.government.bg/MZH/en/Home.aspx</a>	Public
<b>Executive Forest Agency</b>	55, Hristo Botev Blvd., Sofia	<a href="http://www.iag.bg/">http://www.iag.bg/</a>	Public
<b>National Agricultural Advisory Services</b> with 27 regional offices	7, Shosse Bankya Sofia	<a href="http://www.naas.government.bg/en">http://www.naas.government.bg/en</a>	Public
<b>State Fund Agriculture-</b> Paying Agency 28 regional offices	136, "Tsar Boris III, Sofia	<a href="http://www.dfv.bg/en">http://www.dfv.bg/en</a>	Public
<b>Agricultural Academy</b> - including 25 scientific institutes	30 Suhodolska str, Sofia	<a href="http://www.agriacad.bg/">http://www.agriacad.bg/</a>	R&E
<b>Agricultural University of</b>	12, Mendeleev str., Plovdiv	<a href="http://www.au-plovdiv.bg/">http://www.au-plovdiv.bg/</a>	R&E
<b>Trakia University,</b> (Advisory Service for animal breeding in Trakia University)	Student's campus, Stara Zagora	<a href="http://www.uni-sz.bg/index.php?q=eng">http://www.uni-sz.bg/index.php?q=eng</a> <a href="http://virtru2.uni-sz.bg/extension/">http://virtru2.uni-sz.bg/extension/</a>	R&E
<b>University of Forestry</b>	10 Kliment Ohridsky blvd., Sofia	<a href="http://www.ltu.bg/a">http://www.ltu.bg/a</a>	R&E
<b>Ruse University,</b> Agrarian and Industrial Faculty	8, "Studentska" Str Ruse, Bulgaria	<a href="http://www.uni-ruse.bg/en/ru.php">http://www.uni-ruse.bg/en/ru.php</a>	R&E

<b>Forest Research Institute, BAS</b>	132, "St. Kliment Ohridski"	<a href="https://fri.bas.bg/">https://fri.bas.bg/</a>	R&E
<b>National Rural Network, management unit</b>	29 Vladaiska str, Sofia	<a href="https://ruralnet.bg/novini/">https://ruralnet.bg/novini/</a>	
<b>Private advisory sector</b>	Many private companies, individual consultants, etc		Private
<b>Agroinnovation Institute</b>	1 Damyan Gruev, Sofia	<a href="http://agroinnovations.bg/">http://agroinnovations.bg/</a>	NGO
<b>Farmers' organizations/ groups</b>	many	Visit web page of MAFF <a href="https://www.mzh.government.bg/bg/kontakti/polezni-vrzki/">https://www.mzh.government.bg/bg/kontakti/polezni-vrzki/</a>	NGO
<b>Professional organisation</b>	many	Visit web page of MAFF <a href="https://www.mzh.government.bg/bg/kontakti/polezni-vrzki/">https://www.mzh.government.bg/bg/kontakti/polezni-vrzki/</a>	Private
<b>National Agricultural Register of all producers in Bulgaria</b>	many	<a href="https://zemedeliето.bg/">https://zemedeliето.bg/</a>	Private
<a href="https://registarnakooperatsiite.com/">https://registarnakooperatsiite.com/</a>	many	<a href="https://registarnakooperatsiite.com/">https://registarnakooperatsiite.com/</a>	

Table 2. List of semi-structured interview partners

No	Name of interview partners	Organization
1	Elena Ivanova, Milen Krastev	Ministry of Agriculture, Food and Forestry
2	Dimitar Vannev, Ivanka Todorova	National Agricultural Advisory Service
3	Dolores Belorechka, Lubcho Trichkov	Executive Forest Agency
4	Prof Violeta Bojanova	Agricultural Academy
5	Prof Hristina Yancheva, Violeta	Agrarian University of Plovdiv
6	Prof Ivanka Gelyazkova	Trakia University
7	Tanya Georgieva	National Rural Network
8	Vyara Stefanova	MBB Consult
6	Cveta Dimitrova	ABERON LTD.
7	Genoveva Hristova	freelancer

Figure 1. Agricultural Knowledge and Information System (AKIS) in Bulgaria



## Legend

- Public authorities
- Research and education organisations
- Private sector (for profit)
- Third sector farmer/farmer-based organisations
- Third sector NGO (non-profit)
- Strong Linkage\*
- Weak linkage

**Note:** All AFKIS actors identified shall fall into one of the five categories of knowledge and advisory actors. If two categories might apply (e.g. a farmer cooperative), use the dominant one (e.g. farmer-based instead of private body).

### \*Strong linkage means:

- either there are influential actors or organisations at national level that support (parts of) the knowledge system or
- there are dedicated resources allocated to the AKIS, for example public investment is available to enhance advisory services, knowledge production and exchange or
- farmers are being reached by and benefit from advisory services.

# AKIS and advisory services in *Croatia*

## Report for the AKIS inventory (Task 1.2) of the i2connect project

*Date: January, 2021*

**Authors:**

Kristijan Jelaković

Contact: [Kristijan.jelakovic@mps.hr](mailto:Kristijan.jelakovic@mps.hr)

Project funded under the Horizon 2020 Research and Innovation Programme under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION 'HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME'  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

Agriculture Knowledge and Innovation System (AKIS) stands for the exchange of knowledge and supporting services between diverse actors in rural areas. AKIS should provide farmers with relevant knowledge and networks around innovations in agriculture.

AKIS system is an organization and interaction of persons, organizations and institutions that use, produce and need knowledge and innovation from agriculture and interconnected areas. The AKIS system consists of farmers, advisors, consultants, researchers, farmers' organizations, NGOs, networks, retailers, the media, services, public institutions, ministries that transfer knowledge and strengthen the links between research and practice.

To establish a functional AKIS system, it is necessary to assume at least that scientific research has been conducted and applied, innovations presented, digital solutions developed and available, advisory services available, established and functional EIP operational groups, and especially that farmers are involved in the system of counseling, training, exchange knowledge and work of operational groups.

Modernization as the next cross-cutting objective of the CAP is aimed at developing a smart and resilient agricultural sector. The emphasis is on innovation as a fundamental element of the knowledge transfer process. Although innovation occurs at a certain level, the distribution and exchange of knowledge and information is still fragmented and not fully functional. New technologies are being adopted very slowly. Cooperation and exchange between different actors of the AKIS system can be significantly accelerated and improved. A functional AKIS system is one of the main prerequisites for the successful development of Croatian agri-food sector.

Even though, agricultural advisory service is available for farmers and other beneficiaries on land and farm management, covering economic and environmental dimension, it needs further alignment and development to become an integral part of the CAP Strategic Plan by strengthening social dimension and provision of up-to-date technological and scientific information based on research and innovation.

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## 1. Main structural characteristics of the agricultural and forestry sector

The agricultural sector in Croatia is characterized by a numerous challenge that comes from more than 20 years of transition, from controlled, state economy to free trade environment. It is also defined by great climatic variety with specific combination of large flat areas with predominant crop production, hilly part with moderate climate, mountain climate with pastures and Adriatic part with blend of Mediterranean agriculture and fisheries.

Croatian agricultural sector is also characterized by the existence of a large number of small family holdings, where 70% manage less than 5 hectares and only 5% utilize more than 20 ha. The average size of the agricultural holding is around 7 hectares. 30% of the agricultural holdings are managed by people older than 65 years, and only 11% younger than 40 years of age. In Croatian farm register, the total number of holdings is around 170.000, and 98% are family farms characterized by relatively low land and labor productivity, low investment levels, limited performance in the knowledge and innovation sector, and low level of education. 21% of the holders have elementary education, and 6% faculty education.

By type of production, near one third of the holdings are specialized in crop production, one third in grazing livestock, and the others are specialized in horticulture or predominantly mix type of farming. Additionally, only 0,23% of registered producers (in 2016) were organized into cooperatives, that leads to weak negotiating position of small producers in value chain, and fragmentation of production. Croatia is currently competitive in low-value primary agricultural products, and the production structure is dominated by low-value crops and about two-thirds of the country's arable land produces low-value cereals. The average farm income is lower by half than the EU-28 average. During the last two decades, privatization and integration of domestic markets into the EU and global economies have been the dominant forces driving change in Croatia's agricultural sector.

In 2017, the agricultural sector in Croatia employed an estimated 7.5% of the workforce, compared to 4.25% in the EU-28. 43% of the Croatian population lived

in rural areas compared to 19.2% in the EU-28. Participation labor force in rural areas of Croatia was 51% compared to 56.7% in the EU-28.

Total expenditure on research and development in Croatia is low, 0.81% of GDP, compared to 2% in the EU. It is important to emphasize that Croatia also lags behind its main regional and global competitors in the region agricultural research and development. In the current programming period, only 2% of the total envelope is for rural development of Croatia programmed for knowledge transfer and advisory services, just over half of the EU average (which is 3.6%).

## 2. Characteristics of AKIS

### 2.1. AKIS description

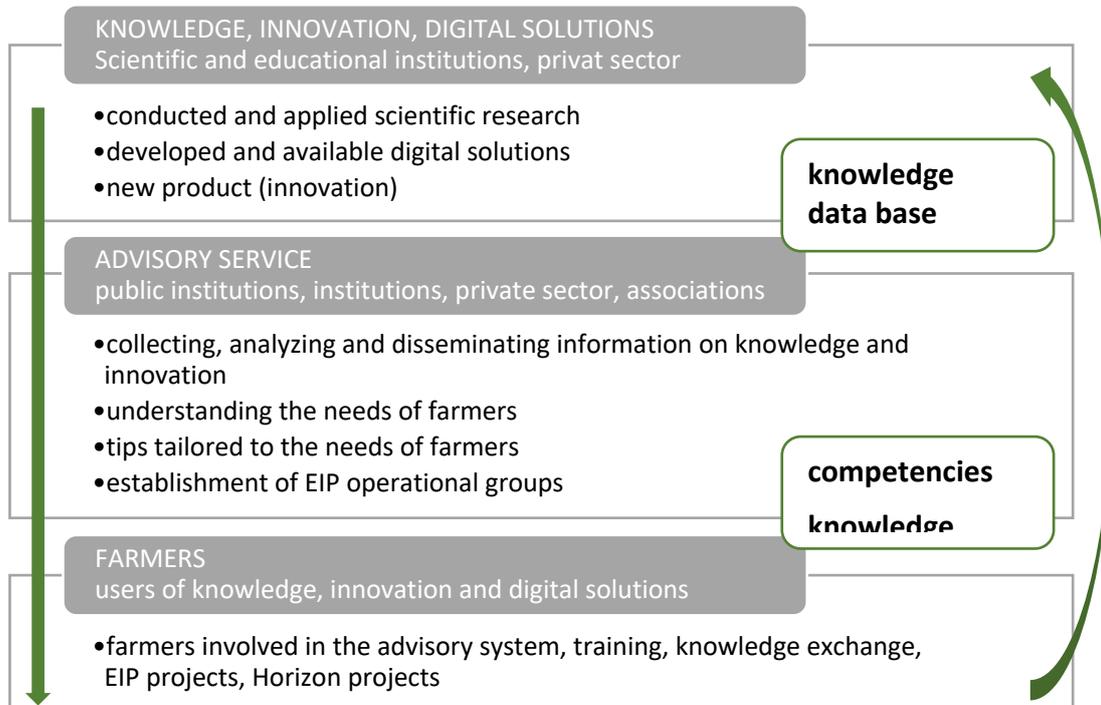
The Croatian Agricultural Knowledge and Innovation System (AKIS) is characterized by numerous public and private entities well experienced in education, research or advisory activities, but their connections are weak and there is no systematic and effective exchange of results, knowledge, data or innovation, which limits their impact to the economy. Research and applied research is happening to some extent but there is no system of transforming of acquired knowledge to the farmers or other stakeholders in the system. Although it was envisaged during establishment of Research Council for Agriculture (VIP) in late 90', the system of transfer of the project results, in form of the technical packages to the farm advisors, was never established. Also, except occasional involvement of some educational entities in short trainings, there was no systematic transfer of knowledge towards advisors.

Many of food processor and input providers are engaged in trials or research projects, mainly oriented to their production needs or marketing purposes. Public Advisory Service were engaged in organization of the trials or demonstration plots but collecting of acquired information and new knowledge was never systematically organized and presented through some knowledge reservoirs or other systems of exchange of information, including e-learning.

Croatian AKIS is moderately diverse with strong influence of public funded entities and, till recently, strong emphasis on public advisory service. Other significant contributions come from the food industry and input providers, who more and more invest in research and innovation and often include highly specialized advice to their cooperants or customers. Least developed part of the AKIS is the one related to the NGOs and farmers association, which is historically conditioned and typical for Croatia and neighboring countries.

The necessity to support producers and businesses entities in agriculture through training, expert advice and important information related to management systems production and compliance should be in future focus of increase investment from public and private sources to agricultural knowledge and innovation.

### 2.1.1. AKIS actors and knowledge flows



### 2.1.2. Policy framework at national level

The implementation of activities concerning establishing the operational and functional AKIS system is aligned with the preparation for the programming period after 2020 and contribution to the objectives of the CAP, which relate to stable income of farmers, increasing the competitiveness of farmers, inclusion of farmers in short supply chains, the impact of agriculture on climate change, sustainable use natural resources, protection of natural habitats, generational renewal, rural development and employment, and health and food safety.

To promote the modernization of the agricultural sector, the Croatian Strategic Plan will provide the answers on how activities and measures can contribute to the objectives: fostering and exchanging knowledge, innovation and digitalization, having in focus:

- establishing the AKIS system and strengthening research links
- accessibility and availability of advisory services to farmers
- recording and monitoring of scientific achievements and digital solutions in agriculture
- establishment and operation of European Innovation Partnership (EIP) operational groups

By defining roles, stronger links between actors and a results-oriented approach, the AKIS system will contribute to the strategic goals, and to the development of a structured and organized environment for knowledge development. In order to transfer valuable information to farmers more efficiently, it is necessary to determine the organizational structure, to define the forms of cooperation and determine the contribution of all actors, and to support the application of innovations and digital technologies in agriculture and rural areas.

The importance and role of agricultural advisors is changing and applied research projects are gradually being replaced by European Innovation Partnership (EIP) projects. This is a significant shift from the previous structure in the context of the underdeveloped AKIS system. With the support of rapid digital transformation in the agri-food sector, this could lead to the discovery of a new, optimal model that will ensure that general and specific information and advice are effectively transferred to farmers.

The AKIS system can play an important role both in meeting national priorities and in linking the objectives set in the new programming period. In order to achieve the expected results, it is necessary to decide on specific activities related to research through the EIP projects or national programs, demonstrations, data exchange, training, advice, pilot projects, etc.

The main current challenge is to better address the knowledge flows along the whole AKIS system, and to create specific incentives for researchers, so they can improve their impact on agricultural practice and share their results in an easy and understandable way using the main dissemination channels used by farmers and advisors.

The new obligation to develop an AKIS plan with defined roles of stakeholders, expected outcomes and enabling elements, will contribute to further improvements, stronger linkages between actors and result oriented approach. This will contribute to both national and EU objectives, development of structured and more organized knowledge developing environment, with more contributing actors. The goal is to produce valuable information faster and translate it to farmers more efficiently than before.

### **2.1.3. Coordination Structures**

The main bearer and coordinator of all activities on the (re)establishment of the AKIS system in Croatia is the Directorate for Professional Support to the Development of Agriculture and Fisheries within the Ministry of Agriculture, responsible for planning, managing and implementing advisory activities in agriculture, and providing expert advice on new technologies, innovations, knowledge and skills needed to develop and preserve the value of rural areas and the sustainable development of agriculture. In addition to the competent body, other actors are included in the AKIS system:

#### **I. Scientific and educational institutions**

- Faculty of Agriculture, University of Zagreb
- Faculty of Agrobiotechnical Sciences, University of Osijek
- Faculty of Veterinary Medicine, University of Zagreb
- Agricultural College, Križevci

## II. Public institutions and institutions

- Croatian Agency for Agriculture and Food
- Institute of Agriculture and Tourism, Poreč
- Agricultural Institute Osijek

## III. Associations,

- Croatian Chamber of Agriculture
- Rural Development Network
- cooperatives, producer associations
- NGOs

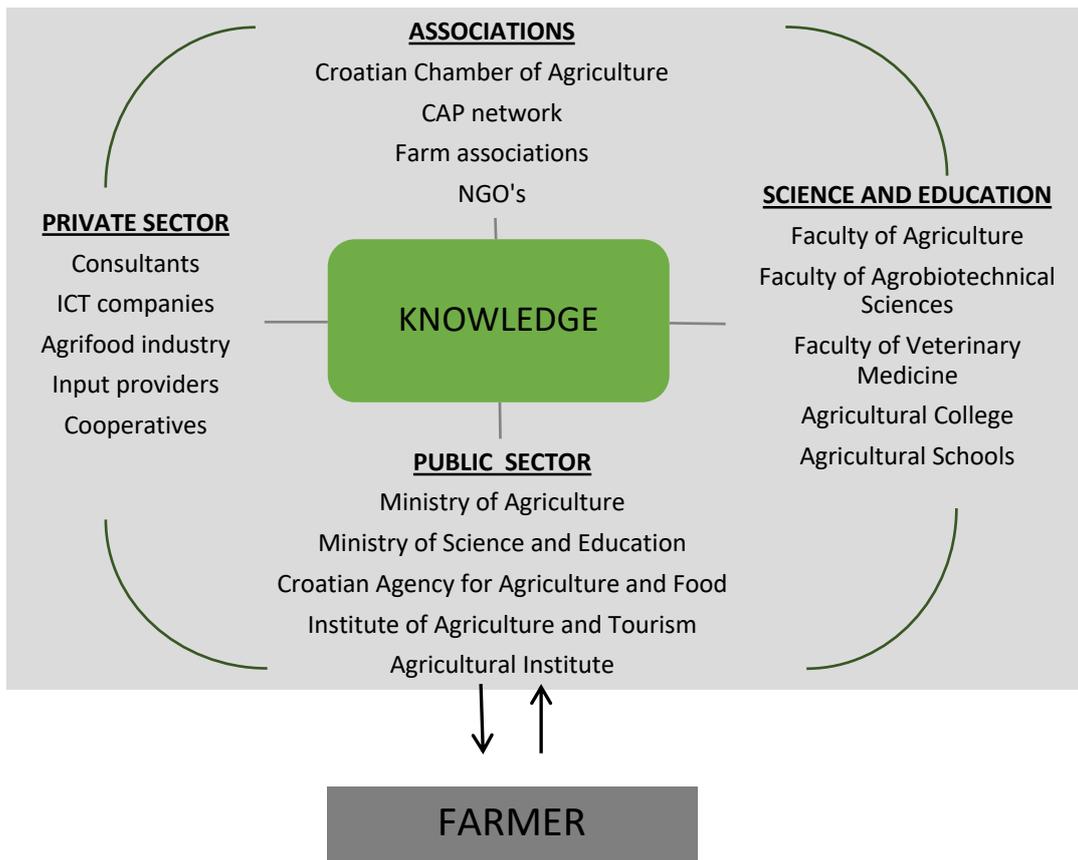
## IV. Private sector

- ICT companies, suppliers, distributors, traders, farmers

AKIS system clearly indicates the importance of advisory services in establishing and implementing the AKIS system and connecting the various actors, their role relates to:

- knowing and understanding (and gathering) the needs of farmers
- willingness and ability to give advice in the field: economy, environment, social relations
- availability of information on the latest scientific achievements and knowledge
- readiness to acquire new knowledge and skills
- ability to transfer knowledge to farmers (application of innovations)
- supporting the establishment and operation of EIP operational groups.

## 2.2. AKIS diagram



### 3. History of the advisory system

Advisory activities in Croatia started in more organized form after the WWII, in the mid of the 20th century. At that time the former state decided to build two principal branches of assistance to farmers, veterinary stations and agricultural stations. Besides having general supportive role, as main spots for public information related to agriculture, intention was to also have educational role and to help with improvement of production.

At first mentioned veterinary and agricultural stations were financed 100% through the state budget. Later, at the beginning of 1960', new concept was introduced where those entities should become partially autonomous and be self-financed by the farmers. Veterinary stations survived that process and, from that period till today, it is common for Croatian farmers to pay for veterinary services. However, number of agricultural stations dropped and merged with state agricultural entities (agro-combinates) whose purpose was to organize production, processing and sales and to serve as a hub for cooperation with private farmers.

During 70' and 80' veterinary services developed enormously while specialized agriculture knowledge remained closed in agro-combinats, with limited influence on family farms.

In the beginning of 90' agriculture advisory service was established as a service within Agriculture Center of Croatia, with 51 regional branches and central office in Zagreb and 120 advisors, financed mostly from the state and rest from local community. This service has two principal layers of activities: regional branches organized to provide coordination of local municipality offices and to provide specialized information for farmers, and local municipality offices established to provide experts advice on production, plant protection, agro-environment issues, legal questions, financial issues etc. During that time, and even 20 years before the term AKIS was introduced, there was clear understanding of necessity to form capable, autonomous advisory services that communicate, learn and work with other stakeholders using all available means as phone, radio, TV, newspapers etc.

Starting in 1996, with financing from the World Bank, the agricultural advisory service implemented a project for strengthening agricultural services and building a comprehensive knowledge system in Croatian agriculture. During five years of the project implementation, basic framework of the Croatian agricultural

knowledge and innovation system was established, with the leading role of Advisory Service as autonomous public institution.

An important step during that period was the establishment of a system of research and knowledge exchange, led by the Agriculture Research Council (VIP), a research-driven body that manages the funds for applied research. The researches were expected to respond directly to problems of agricultural producers, to create new production technologies and to apply technologies adapted to different production conditions, especially the conditions of family farms. The VIP Council was established to serve as the main cohesion factor between different AKIS entities and to provide current knowledge and information for the farm advisors. A system for transfer of knowledge to farm advisors was established in the form of regular workshops and development of specific technical packages for advisors, upon completion of research.

During the 2002 – 2012 period, the main role of the VIP Council to serve as a knowledge hub and generate current knowledge for advisors, was practically forgotten and abandoned. Research continued, but the methodology for decision making on the research topics did not ensure strong farmers participation. The Advisory Service continued its function to serve the Ministry of Agriculture needs to deliver basic information to farmers, to help with statistics and application for subsidies. Specialized advice was also stated as a part of daily work of advisors, but this kind of advice was given only occasionally, within other administrative activities. In 2010 the Advisory Service was, by government decision, moved to be a part of newly formed Agriculture Chamber. In 2012, after numerous issues and challenges that occurred, it was again settled as a public institution.

In 2012, according to the new law of Advisory service, independent entity was again established, entering in its most dynamic period from its founding. During that time Advisory Service joined international associations of advisory services and started to cooperate in international projects. Also, co-financing of advisory services from diverse sources was pursued. Diversification of financing came from using the measure for advisory services in the rural development program (Measure 1 and 2), and from project activities (H2020 projects). The main goal was to achieve greater financial stability, independence and sustainability of operations, while upgrading the quality of services to farmers. Examples from other EU countries were followed and the whole process was closely aligned with ongoing EU AKIS development and recommendations for advisory services.

Throughout the last two decades, Advisory Service had an influential position in Croatian AKIS. It was a specialized public institution, responsible for advisory activities in agriculture, rural development and fisheries, including dissemination of general information to farmers, organization of vocational training, technical advising on farms, pest management forecasting and training, advising of forest owners, education and control in forestry, advising in fisheries and rural development program.

In 2018, Advisory Service was abolished as a specialized public institution and its employees and assets were merged with the Ministry of Agriculture. Also, applied research (VIP) projects will be substituted by European Innovation Partnership (EIP) projects.

Today, Directorate for Professional Support to the Development of Agriculture and Fisheries within the Ministry of agriculture, as legal successor of the former Advisory Service is responsible for planning, managing and implementing advisory activities in agriculture, and providing expert advice on new technologies, innovations, knowledge and skills needed to develop and preserve the value of rural areas and the sustainable development of agriculture.

1991 – 1997	Department within the Ministry of agriculture (MA)
1997 – 2010	Croatian Agriculture Extension Institute (CAEI)
2010 – 2012	Croatian Chamber of Agriculture – Public Advisory Service (CCA)
2012 - 2018	Advisory Service Croatia (ASC)
2018 - 2019	Croatian Agricultural and Forestry Advisory Service (CAFAS)
2019 -	Directorate for Professional Support to the Development of Agriculture and Fisheries (MofA)

Recent structural and organizational changes in agricultural advisory system represent a significant shift from the previous setting, which, in still undeveloped AKIS, can contribute to uncertainty and unpredicted outcomes. However, with support of rapid digital transformation in the agriculture, it is possible to find new,



optimal model that will ensure both general and specific information and advice to farmers.

## 4. The agricultural advisory service

### 4.1. Overview of service supplier

The Directorate for Professional Support to the Development of Agriculture and Fisheries within the Ministry of Agriculture, is administrative body responsible for planning, managing and implementing advisory activities in agriculture, and providing expert advice on new technologies, innovations, knowledge and skills needed to develop and preserve the value of rural areas and the sustainable development of agriculture.

Currently, Directorate is responsible for requirements, conditions and management commitments applying to the beneficiaries set in the CAP Strategic Plan, including requirements and standards under conditionality and conditions for support schemes as well as information on financial instruments and business plans, water protection policy, protection of natural habitats and of wild fauna and flora, ambient air quality, plant protection products and sustainable use of pesticides, transmissible animal diseases, farm practices preventing the development of antimicrobial resistance, risk management, innovation support for preparing and for implementing Operational Group projects of the EIP for agricultural productivity and sustainability.

On the other side, a process of strengthening the development of independent private sector is in place for the advisors in agriculture and rural areas. It is hard to envisage how the majority of small and medium size family farmers will accept private advisors. Also, some of them will probably have to work closely with existing input providers or agro-processors. However, private advisors are welcome change to the sector. Announced process of certification and obtaining of a permit should be as simple as possible to enable greater involvement of interested experts and bigger choice for the farmers, especially the advanced ones. Also, certification process should be oriented towards examination of advisory skills, not only on actual technical knowledge. Recommended certification option for advisory skills is already established on EU level under CECRA initiative (<https://www.cecra.net>) and should be used as a model.

## **4.2. Public policy, funding schemes, financing mechanisms, advisory service providers**

According to the policy proposal on Strategic Plans, the Member States should set agriculture advisory services for improving the sustainable management and overall performance of agricultural holdings and rural businesses, covering economic, environmental and social dimensions, and to identify the necessary improvements regarding all measures at farm level in the CAP Strategic Plans.

To enhance the quality and effectiveness of the advice, Member States should integrate farm and rural advisors within the AKIS, to deliver up-to-date technological and scientific information, developed by research and innovation. The agricultural advisory system of synergistic three elements: general, public advisory service, specialized semi-commercial advisory service and private advisory service should preserve security of fulfilling public needs and minimum quality, with additional freedom of choice for beneficiaries and openness through private actors.

Formation of Central Agriculture Information System which connects all existing databases from agri-food sector (land, farm register, subsidies, register of animals, organic production, beekeeper registry etc) will be merged into one comprehensive IT system which should externally be presented as user friendly web site and mobile app. All related administrative data should be searchable and open for further analysis, and presented at state, county or municipality level. Individual data should be displayed through the system.

## **4.3. Human resources and methods of service provision**

Directorate for Professional Support to the Development of Agriculture and Fisheries within the Ministry of Agriculture has more than 300 employees, operating in 21 counties in more than 100 local offices. County headquarters and local offices comprise expert advisors from various fields of agriculture – crop and animal production, plant protection, rural development – depending on local needs. Central office is based in Zagreb where most of the management and supporting staff operates.

## 1 HEAD OFFICE IN ZAGREB

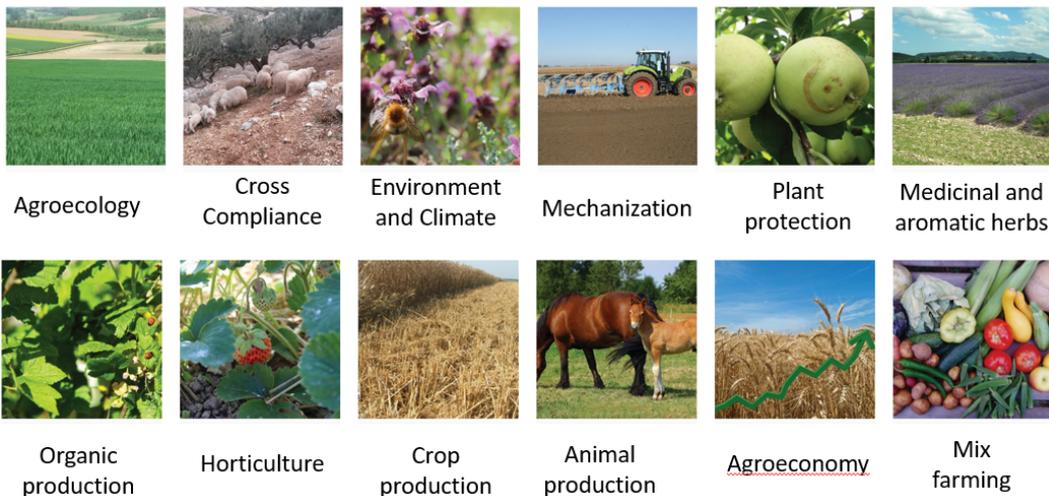
Advisory service in agriculture and fishery	Rural development measures
Expert support in development	Fishery policy measures
Plant protection	Business development of young farmers and fishermen
Innovative technologies	Income support and market measures
Education and training	Information, promotion and publication
Organisation and coordination of advisory work	



As from 2015, the advisory service started to diversify its funding and to finance itself from several new sources. Till today, some basic advisory activities are:

- helping farmers to understand all aspects and key elements of Direct payments scheme
- helping farmers in applications for subsidies for direct payments,
- providing support, information and advises about policy measures (RDP, CMO) and opportunities for benefits
- organisation and conduction of vocational education, trainings and demonstration activities (Measure 01) for all mandatory beneficiaries of Measure 10 "Agriculture, environment and climate change", Measure 11 "Organic agriculture, young farmers as well as Measure 14" Animal welfare" which are regularly covered
- provision of advisory work „one to one” (Measure 02: Advisory Service, Agricultural Management Services and Agricultural Farm Assistance) as a set of activities aimed at the users in order to better define the scope

Existing vocational training program for farmers covers topics: cross compliance, environment and climate change, organic farming, sustainable use of pesticides, young farmers (compulsory modules) and courses the field of crop production, animal husbandry, diversification, irrigation, farm management, digitalization, bioeconomy (optional modules). Each of the total of fifty (50) vocational training courses for farmers is harmonized in terms of content and time with a specific topic and the obligations and requirements of the participants



Advisory package help farmers to know exactly what to expect from the advisory service, depending on the type of production and the goals that they want to achieve in production. Advisory packages covers key areas of production and enable them to meet the priorities, focus areas and topics set by the RDP.

Although the number of advisers is limited and regularly below average, the advisory service and vocational training includes advice on cross compliance, a package of environmental measures, climate change and organic farming, advice on modernizing and increasing the competitiveness of farms, advice to young farmers, and vocational training of farmers (including topics related to the business of young farmers, farm management, etc.). Advisory service activities through the are carried out by providing advisory packages by the farmers and the method of individual advises, ie by implementing a vocational training program.

#### 4.4. Clients and topics

Main topics and clients related to advisory activities are:

- technological and technical improvement of farms and the provision of expert support to farmers and fisheries
- implementation of RDP Measures - Knowledge transfer and Advisory Service
- promotion of knowledge and innovation in agriculture and fisheries
- advices, instructions and practical demonstrations in the field of agriculture and fisheries
- organization of demonstration activities
- dissemination of information and publishing

Focus of advisory activities is on Intensity and quality of individual advisory work with the farmers, vocational education and training for farmers (environmental measures, organic production, animal welfare), business development of young farmers, education and trainings of employees (specialization of advisors), information and support to RDP beneficiaries, international projects (Horizon 2020 on knowledge, innovation, digitalization), and new areas of cooperation with partner institutions.

## 4.5. Programming and planning of advisory work

The activities aim to clearly define the organizational structure of the AKIS system, the distribution of roles and tasks, and the definition of those types of advisory services that are aimed at knowledge transfer, and the application and adoption of innovations, and relate to:

- collecting data on the competencies and preferences of advisors
- revision and supplement of the professional development program of advisors
- formation of teams of specialist advisors in the field: economy, environment, and social relations
- organization of education of advisors in the field of social relations (communication, relations, etc.)
- creation a database on the needs and requirements of farmers
- collection of data on available scientific achievements, new technologies and techniques, digital solutions, etc.
- contracting cooperation with scientific and educational institutions, private companies and non-governmental organizations on the exchange of information on relevant technological achievements, knowledge and innovations

- creating a database of new knowledge and innovations
- support for the establishment and operation of EIP operational groups
- implementation of H2020 projects
- participation in the preparation of CAP strategic documents after 2020

#### **4.6. Advisory organisations forming the FAS and evaluation of their FAS implementation**

According to annual working plans, aligned with the policy proposal on Strategic Plans, the role of advisory service (Directorate within the MofA) is to improve the sustainable management and overall performance of agricultural holdings and rural businesses, covering economic, environmental and social dimensions, and to identify the necessary improvements regarding all measures at farm level in the CAP Strategic Plans. To enhance the quality and effectiveness of the advice, Member States should integrate farm and rural advisors within the AKIS, to deliver up-to-date technological and scientific information, developed by research and innovation.

## 5. Summary and conclusions

### 5.1. Summary and conclusions on sections 1 – 3

The AKIS in Croatia is still highly fragmented and strongly influenced by publicly funded bodies where available. The history of the organization of the advisory service in Croatia is exclusively related to the functioning of the Public Agricultural Advisory Service, which was established in the late 90's, and through various forms of organization was the only institution in charge of providing advisory services. Scientific-educational and research institutions operating in the agricultural sector are for the most part state-owned.

The "new" role of advisors related to more active involvement in the establishment and functioning of the AKIS system will certainly require adaptation of existing and development of new advisory processes and systems, where the possibility of participation of private advisors of appropriate competencies is not excluded. Currently, activities are underway to establish a Committee for the establishment of the AKIS system in the Republic of Croatia and the process of drafting the AKIS plan with defined forms of cooperation and roles of all actors involved in knowledge transfer, application and adoption of innovations and digital solutions.

More general conclusion are as follows:

- No substantial research and innovation in agri-food sector
- Lack of cooperation and exchange between AKIS actors
- No permanent education of the public farm advisors
- Collected agriculture data is not easily visible and accessible
- Most of the farmers are not in line with modern developments in agriculture
- No support for research and innovation
- Weak perception of agriculture among the young

### 5.2. Summary and conclusions on sections 4

The basis of the AKIS system is the conversion of research results and projects into information packages that can be used in the education of advisors and / or

farmers. The AKIS system is a mandatory part of the CAP's strategic plan and a mechanism for achieving specific objectives in the agri-food sector.

Transforming research results and projects into information packages for advisors and farmers requires the development of a central information system in agriculture, a central data base for knowledge, innovation and new technologies. Although information on all relevant research and innovation at the national and international level is available, their connection and use is not possible, especially by end users. Therefore, it is necessary to consolidate all information, convert information into understandable language and determine how to transfer information to end users (application solutions).

Monitoring the needs of farmers and identifying possible solutions based on knowledge, innovation and technological achievements must be an integral part of the central information system in agriculture, and be used as a basis for the establishment and operation of EIP operational groups.

The post 2020 CAP cross-cutting objective on modernisation, knowledge sharing, innovation and digitalisation can be reached only when all relevant actors are involved in the AKIS Strategic plan together: when they cooperate and share responsibilities. The involvement of researchers is essential, and the possibility to share their work with practice can improve both the research organisation and its impact. The organisational structure of AKIS systems should enhance knowledge flows and strengthen links between research and practice. All approaches, for which research needs to bridge the gap with practice so that farmer practices become in line with the policies and societal challenges, are to be examined within the AKIS systems. Be aware that AKISs do not only relate to the narrow "agri"culture, but also incentivise the related food as well as non-food value chains to become more functional up until the consumer, and tackle biodiversity, environmental and climate change issues, rural challenges and much more.

A well-organized and functional AKIS system is the basis for efficient and competitive agriculture in Europe. Investing in knowledge and innovation will be as important as strengthening advisory services in agriculture and rural areas.

## **6. Acknowledgement of partners, information sources and gaps**

*To be added*

## References

*To be added*

# AKIS and advisory services in *Cyprus*

## Report for the AKIS inventory (Task 1.2) of the i2connect project

***Date: December 2020***

**Authors:**

Alex, Koutsouris  
Eleni Zarokosta  
Vassiliki Kanaki

Contact: [koutsouris@aua.gr](mailto:koutsouris@aua.gr)

Project funded under the Horizon 2020 Research and Innovation Programme under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION' HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

The main aim of the report is to provide a comprehensive description of the Agricultural Knowledge and Information System (AKIS) in Cyprus, with a particular focus on agricultural advisory services. This report is one of the AUA outputs<sup>1</sup> in the framework of Task 1.2 of the i2connect project (Connecting advisers to boost interactive innovation in agriculture and forestry) aiming “... to update the existing AKIS descriptions for the 27 EU member states (cf. <http://proakis.webarchive.hutton.ac.uk/>) and to expand the inventory through elaboration of reports for Croatia, Switzerland, Montenegro and Serbia.” (i2connect Grant Agreement). Thus, it is one of the country reports that were produced in 2020 by project partners and subcontractors for compiling an inventory of Agricultural Knowledge and Information Systems. In this report, AKIS description is based on the infrastructural concept. The report at hand thus includes AKIS characteristics (actors, policy, governance and coordination), a short history of the advisory system, and an overview of the current advice providers and their key characteristics (such as funding, human resources, advisory methods, clients and topics, etc.).

The agricultural sector in Cyprus is characterised<sup>2</sup> by the second smallest average farm size (3.2 ha. vs. 15.2 ha. in EU-27), the second highest proportion of small scale family farms (75.7% less than 2 ha.) and a rather small percentage of employment in agriculture (2.1% vs. 4% in EU-27). The average age of farmers is higher than in most European countries (44.6% over 65 years old vs. 32.8% in EU-27); the number of young managers less than 40 years old by 100 elderly managers (65 years old and over) is the lowest in the EU-27 (7.3 vs. 32.5 in EU-27) while, at the same time, 72.5% of the farm managers have practical experience only (vs. 68.3% in EU-27).

Labour productivity in agriculture (EUR/AWU<sup>3</sup>) is below (82.6%) the EU-27 average. Animal production is more important than livestock production (61:39 in terms of gross output, 2018). Farms with livestock account for 29% of all farms.

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<sup>1</sup> The second one concerns the Greek AKIS report.

<sup>2</sup> The data cited here were drawn for the CAP context indicators.

<sup>3</sup> Euro per Annual Work Unit.

Almost two thirds of the agricultural output value come from milk, pigs, poultry, fruits and fresh vegetables.

Main crops<sup>4</sup> are fodder crops, cereals, olive plantations, vineyards, potatoes, citrus, nuts and fruit trees and vegetables. Out of the total agricultural land almost 19% is irrigated (2010). The breeding of pigs is important in Cyprus (almost 39% of all LSU<sup>5</sup>) followed by small ruminants (27%) and dairy cows (14%).

Cyprus has a substantial component of its AKIS within a single organisation (MANRE, the Ministry of Agriculture, Natural Resources and Environment). The Agriculture Division of MANRE undertakes activities in research through ARI (the Agricultural Research Institute) as well as in extension and farmers' education/training (Agricultural Extension Section of the Department of Agriculture). The Agricultural Extension Section comprises the headquarters (in Nicosia) and six District Agricultural Offices further divided into smaller target-areas called "agricultural beats". The Agricultural Extension Service aims at informing MANRE and ARI on farmers' problems, and to plan, promote and evaluate extension programs (information and training activities on innovations) as well as to carry out a wide variety of agricultural projects. Its activities are complemented by private (input) shops (run by agronomists) and private consultants as well as farmers' unions and producers groups. LAGs and other stakeholders play an important role in terms of rural development projects.

Cyprus has retained a strong, largely publicly funded advisory service, free of charge for farmers. There is recognition that given the very small farm size of holdings in the country the government should support farmers through a public advisory service.

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<sup>4</sup> In terms of cultivated area.

<sup>5</sup> LSU = Livestock Units

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## Abbreviations

ARI: Agricultural Research Institute

CAP: Common Agricultural Policy

DA: Development Agency

DoA: Department of Agriculture, MANRE

KEGE: Agricultural training center

MANRE: Ministry of Agriculture, Natural Resources and Environment

NRN: National Rural Network

OGs: Operational Groups of European Innovation Partnership – Agriculture

## 1. Main structural characteristics of the agricultural and forestry sector

### ***General country information<sup>6</sup>***

Following some key-data about Cyprus are provided. The total area of land covered by the Cypriot state is 9,213 km<sup>2</sup> (AFF) with the share of farmland being 12.1 % (2016, AFF). The country's population is 0.9 million (2018, AFF). The GDP<sup>7</sup> is 21.1 billion EUR and the GDP per capita 24,017 EUR (2018, ASF). Unemployment is as high as 8.2% of the labour force (2018, ASF). The exports of agricultural products are 382million EUR while the imports are 1,113 million EUR (2018, ASF).

### ***Information on the agricultural sector***

Following an overview of the agricultural sector is given, using topical data that underline the agricultural features of the country. Agriculture contributes to employment by 2.1% (2017, ASF) while it contributes 1.6% to the GDP (2018, AFF).

The farmland (Utilised Agricultural Area - UAA) is estimated to 112 thousand hectares (2016, AFF) with 34,940 (2016, AFF) farms (agricultural holdings). The average farm size (UAA per holding) is 32 ha. (2016, ASF) with the majority of the farms being characterized as very small, either in terms of either standard output (81.2% with standard output less than 8,000 EUR; 2016, AFF<sup>8</sup>) or size (89.6% have UAA below 5 ha.; 2016, ASF). The great majority (97.6%) of all farms are family farms, i.e. more than 50 % of regular labour comes from family members (2016, AFF).

With regard to organic farming, the area under organic farming is as high as 4.55% of UAA (2018, Eurostat)<sup>9</sup> with the organic crop area (fully converted area) being 3,768 ha (2018, Eurostat)<sup>10</sup>.

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<sup>6</sup> Sources: AFF: Agriculture, Forestry and Fishery Statistics 2019 and ASF: Agristatistical Factsheet 2019

<https://ec.europa.eu/eurostat/documents/3217494/10317767/KS-FK-19-001-EN-N.pdf/742d3fd2-961e-68c1-47d0-11cf30b11489>

<sup>7</sup> Gross Domestic Product

<sup>8</sup> Economic size < 4,000 € (2016): 70.4% (ASF)

<sup>9</sup>

[https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=sdg\\_02\\_40&language=en](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=sdg_02_40&language=en)

<sup>10</sup> <https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=tag00098&language=en>

Furthermore, according to ASF (2016) the farm holders less than 35 years old account for the 1.3% of all holders while the ones over 64 for 44.6%. The total labour force input in agriculture is 21 thousand annual work units<sup>11</sup> (2018, AFF). Young farmers (under 40 years old) (2016) account for 3.3 % of all farm managers with female farmers being 22.6% of all farm managers (2016, AFF). Farmers with full agricultural training account for only 0.6 % of all farm managers (2016, AFF).

Table 1.1: Structure of farm labour force (2016, ASF)

<b>Family labour force</b>	68,370 persons 13,250 AWUs	<b>Non family labour force</b>	Persons (not available) 3,950 AWUs
<b>Holders</b>	<b>Family members</b>	<b>Regular non-family labour force</b>	<b>Non regular non-family labour force</b>
34,370 persons 7,440 AWUs	34,000 persons 5,810 AWUs	3,950 AWUs	1,530 AWUs
<b>Total farm labour force: 18,730 AWUs</b>			

The value of agricultural output (production value at basic prices) (2018) is 732 million EUR with the Gross value added (at basic prices) being 341 million EUR<sup>12</sup>. The value of crop output is 279 millions EUR while the value of animal output is 430 millions EUR (2018, AFF). The main branches of agricultural production are illustrated in Table 1.2.

Table 1.2: Crop and Animal Production (in thousand tones)<sup>13</sup>

Cereals	2018	25
Root crops	2018	102
Fresh vegetables	2018	84
Permanent crops	2018	146
Raw milk	2018	295
Bovine meat	2018	5
Pig meat	2018	42
Poultry meat	2018	25

<sup>11</sup> AWUs = Annual work units. An AWU is equivalent to a worker employed on a full time basis for one year.

<sup>12</sup> Gross value added from Agriculture, forestry and fishing (2018): 2.0% of total GVA (ASF)

<sup>13</sup> Source: Agriculture, Forestry and Fishery Statistics 2019 (AFF); for sheep and goat meat: <https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=tag00045&language=en>

Sheep and goat meat	2018	5.58
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Specifically as far as animal production is concerned, all livestock categories account for 172,080 LSU<sup>14</sup>, with the livestock density index (2016) being 1.54 LSU/ha UAA<sup>15</sup>. A more detailed account of Heads and LSUs is provided in Table 1.3.

Table 1.3: Livestock in Cyprus

Livestock <sup>16</sup>	Year	Heads	Livestock Units (LSU)
Bovine	2016	53,710	39,900
Pigs	2016	265,042	60,770
Sheep	2016	264,803	26,480
Goats	2016	169,980	17,000
Poultry	2016	2,600 thousand heads	24,240

**Information on the forestry sector.**

The forest and other wooded land is 386 thousand hectares (2015, AFF) while the farms with wooded area Greece are 1,080 holdings<sup>17</sup>. An overview on the forestry sector is provided in Table 1.4.

Table 1.4: Forestry in Cyprus

Forestry	Year		
Forest and other wooded land	2015	386	thousand hectares (AFF)
Persons employed in forestry and logging	2016	390	Working units
Gross value added (at basic prices)	2016	2	EUR million
Roundwood (in the rough)	2017	16	Thousand cubic metres

Source: Agriculture, Forestry and Fishery Statistics, 2019

The output of forestry and connected secondary activities is 3.90 millions EUR (2015, Eurostat)<sup>18</sup> and the Gross Value Added (at basic prices) is 2 millions EUR (2016, AFF).

<sup>14</sup> The livestock species aggregated in the LSU total, for the purpose of this indicator, are: equidae, bovine, sheep, goats, swine, poultry and rabbits.

<sup>15</sup> Source:

<https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tai09&plugin=1>

<sup>16</sup> Source: Cypriot Statistical Authority (2018); for poultry and LSU see Eurostat (Main livestock indicators by NUTS2 regions)

<sup>17</sup> Source: [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ef\\_lus\\_main&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ef_lus_main&lang=en)

<sup>18</sup> [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for\\_eoutput&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for_eoutput&lang=en)

Finally, while the persons employed in forestry and logging amount to 390 working units (2016, AFF), a more recent account is illustrated in Table 1.5.

Table 1.5: Employment in forestry related activities (2019)<sup>19</sup>

Type of employment		Number of employed persons (in thousands)
Forestry and logging	2017	0.6 <sup>(u)</sup>
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	2017	2.5
Manufacture of paper and paper products	2017	0.5 <sup>(u)</sup>
Manufacture of furniture	2017	1.2 <sup>(u)</sup>
Total (for manufacture)	2017	4.2

(u) = low reliability

<sup>19</sup> [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for\\_emp\\_lfs&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for_emp_lfs&lang=en)

## 2. Characteristics of AKIS

### 2.1. AKIS description

In Cyprus the main AKIS actors can be depicted as follows:

In the first place, the Ministry of Agriculture, Rural Development and Environment in Cyprus consists of ten Departments within three divisions, namely the Agriculture and Rural Development Division, the Natural Resources and Environment Division and the Strategic Planning and Human Resources Division. The Department of Agriculture as well as ARI (the Agricultural Research Institute) are included in the Agricultural and Rural Development Division of the Ministry. The Dept. of Agriculture comprises 14 Sections, one of which is the Agricultural Extension Section.

Extension work is coordinated by the Extension Section at the headquarters in Nicosia in association with the six Agricultural District Offices of the Dept. (together making up the Agricultural Extension Service). The Extension Section comprises of the following sectors: Extension Program Planning and Implementation, Program Evaluation, Publicity, and National Rural Network (including the Cyprus European Innovation Partnership). Therefore, the Extension Section coordinates all extension activities in close cooperation with the District offices (including three local agricultural (farmers') training centres – KEGE) and the other specialist sections of the Dept. of Agriculture. Furthermore, wherever and whenever needed, the Extension service communicates with other Depts. within the Ministry to provide a comprehensive solution, i.e. to resolve a certain farming problem.

In terms of Higher Education Institutes (HEIs), the Cyprus University of Technology is a rather newly established institution (2004; operational since 2007), including the Faculty of Geotechnical Sciences & Environmental Management.

Furthermore, around 40 private advisory/consultants' companies, and quite a number of private (input) shops/companies (run by agronomists), cooperatives<sup>20</sup>

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<sup>20</sup> In Cyprus there are 5 Farmer Unions affiliated to the main political parties. Nevertheless, they cooperate to promote the Cypriot farmers' interests in the EU through COPA-COGECA and CEJA (European Council of Young Farmers)

(dealing with the processing and marketing of produces) and producers groups are active in agriculture. The role of Development Agencies (LEADER/CDLL Local Action Groups) has to be underlined in terms of rural development.

In Cyprus the main actor generating Agricultural knowledge is ARI. Due to its recent establishment, it is only nowadays that the University becomes an important player in this respect. New Agricultural knowledge and technology is also imported or generated (experimental plots) by private agronomists' companies (input shops).

The major linking actor between research and farmers is the Extension Section of the Dept. of Agriculture. The fact that ARI is an integral part of the Ministry of Agriculture makes two-way communication between research (ARI) and extension easier; however, in general, researchers are mostly concerned with publishing their research results in scientific journals (as is elsewhere too) rather than with solving farmers' problems. Links between the University and the Dept. of Agriculture are developing, although mostly informally.

Therefore, ARI and, lately, the Cyprus University of Technology, along with private (input) companies are the major generators of agricultural knowledge or transfer knowledge and innovations from abroad.

Furthermore, it is, more or less, commonly accepted among all actors that the Extension Section plays an all important role, esp. in the dissemination of knowledge and technology. Private companies' and input shops' agronomists<sup>21</sup> as well as producer groups' and cooperatives' agronomists (esp. of the ones applying quality systems) also contribute to the transfer of knowledge and technology to farmers. Finally, farmer-to-farmer dissemination plays an important role in a small country such as Cyprus.

In a sense, there is not any specific policy framework or formal agreements between the AKIS actors<sup>22</sup>. However, the functioning of the Extension Service covers as a coordination mechanism, one way or another, the Cypriot agriculture needs. More or less, beyond dealing with strictly legal matters (re: the EU Regulations), there is contact with the farming/rural population, esp. producer

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<sup>21</sup> For some, private agronomists (working for input companies or input shops' owners) are the main actors providing advice to farmers; advice accompanies the purchase of inputs by the farmer and is not charged (is "free") as such.

<sup>22</sup> The Cypriot Agricultural Research Council, est. 2015, is thus far inactive.

groups and farmers' unions (as for example meetings with the Boards of such groups) as well, indirectly, through the Development Agencies and other rural development actors with whom extension is closely cooperating. District Offices and beats extension officers are in contact with farmers and act as two-way communication mechanisms between the Extension Section and farmers. The Extension Section with some input from ARI puts together the annual extension programmes which the Section monitors and evaluates (although not always formally – in the strict sense). On the other hand, ARI staff participates in several of the service's educational activities and tries (although without a relevant section/staff or funds) grasp with farmers' problems.

Missing links may be identified between private (input) companies and the extension service as well as between consultancy/advisory companies and the service (i.e. beyond legal matters or trainings). Such companies however may cooperate with District Offices in case production problems arise.

Nevertheless, some points of criticism or concern are also put forward mainly concerning the increasingly bureaucratic tasks undertaken by the Extension Service as a result of both the country's accession into the EU (2004) and the obligations imposed by the Troika (2013) due to the economic crisis (resulting in decreasing contacts with farmers - a fact acknowledged by all actors in Cyprus). Concerns are also expressed about the adequate staffing of the Section, and more generally of the Dept., which along with the pressure for the restructuring (downsizing) of the public sector by the Troika, may result in the downgrading of extension/advisory work. The updating of extension officers knowledge (including extension methodology) has also been put forward (although not as forcefully).

To this, the decreasing interaction of ARI, in the last years, with farmers has to be added. Under the current circumstances both ARI and the Cyprus University of Technology are largely dependent on participation in EU-funded projects which nevertheless do not, more or less, correspond to the needs of the Cypriot agriculture. The two institutions do not have own mechanisms to disseminate the knowledge they generate; furthermore, they are largely oriented towards publications in scientific journals and less in publications in popular magazines or the (farming) press. An important fact (confirmed by both ARI and the University)

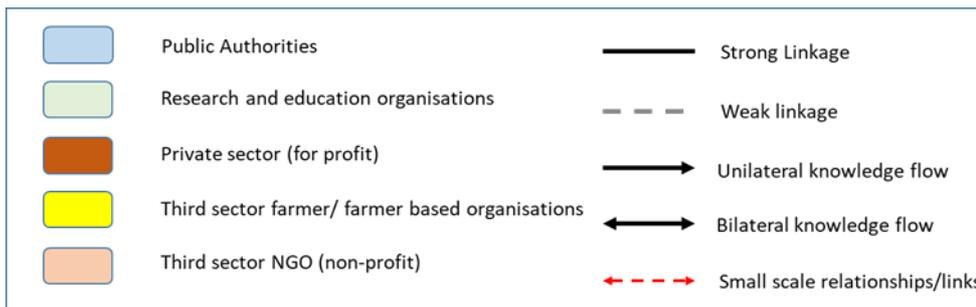
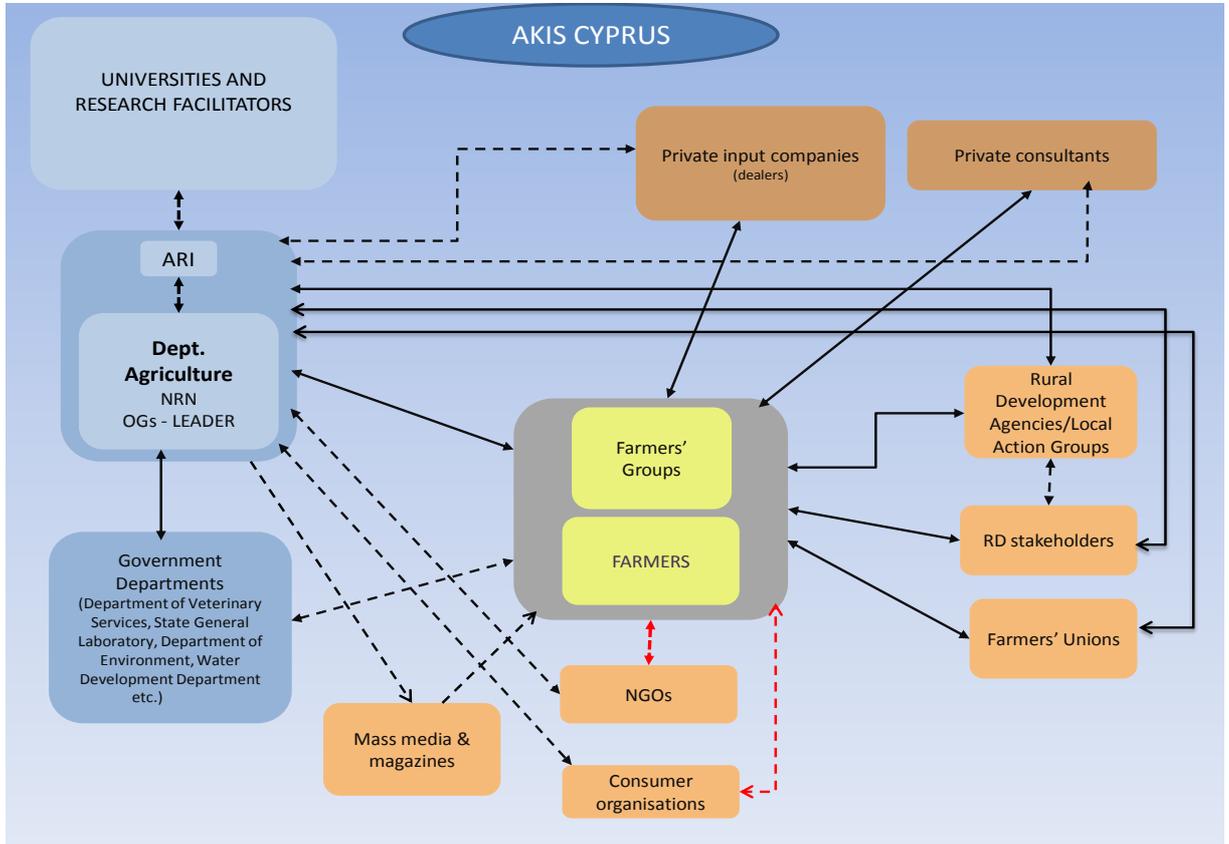
is that (very few) farmers have started to ask for specific information related to small-scale projects (mainly analyses) which they fund<sup>23</sup>.

As a result, quite a few of the actors in Cypriot agriculture suggest a more intensive cooperation between all the actors concerned (with the lead of the Dept. of Agriculture/ Extension Section). The employment of a network of experimental plots (collaborative experiments) for the generation-testing-adaptation-introduction of innovations is also put forward. For such a collaborative network, the need to focus more on farmers' needs as well as on (the enhancement of) farmers' occupational training and experiential learning is underlined. Farmers, on their part, have to become more open and willing to share their know-how with their colleagues and thus allow for/facilitate farmer-to-farmer transfer of innovations. A further obstacle stems from farmers' unwillingness to pay for advice (since currently they do not, in general, have to pay) as far as private services are concerned. Additionally, farmers are presented as unwilling to undertake risks while, on the other hand, introduce new cultivations without waiting for the results of experimental plots run by ARI and/or the Extension Section.

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<sup>23</sup> The lack of courses on extension in the university should be also underlined. The university cooperates with other relevant actors (progressive farmers, companies, private advisors, development agencies, etc.) largely due to funding opportunities such as projects, thus, usually, without establishing permanent links with them.

## 2.2. AKIS diagram



### MEMO:

Research facilitators: National Research Council

ARI: Agricultural Research Institute

NRN: National Rural Network

OGs: Operational Groups of the European Innovation Partnership (EIP-AGRI)

RD stakeholders: various groups involved in rural development<sup>24</sup>

<sup>24</sup> Mainly emigrants' associations involved with LEADER LAGs.

### 3. History of the advisory system

It is worth mentioning that the Extension Section of the Dept. of Agriculture has changed little since its establishment in the 1960s.

As aforementioned, the Sections' headquarters are located in Nicosia. The Extension section coordinates all of the Extension activities with the close cooperation of the District offices and the other specialist sections of the Dept. of Agriculture and/or other Depts. within the Ministry.

Furthermore, for practical purposes and for facilitation of extension activities, the District offices are subdivided further into smaller target-areas called "agricultural beats"<sup>25</sup>. The number of villages within each beat differs depending on population density and production intensity. Each beat is served by an extension agricultural officer, who is a university graduate (agronomist). Agricultural officers are assisted by agricultural or animal husbandry technicians. Currently, the extension service employs 50 people of whom 70% university graduates.

In general, the objectives of the Agricultural Extension Service is to inform the Ministry of Agriculture, Rural Development and Environment as well as the Agricultural Research Institute (ARI) on problems farmers encounter, to train farmers on innovations regarding agriculture, and to plan, promote and evaluate extension programs as well as a wide variety of agricultural projects. Extension employees use a variety of extension communication methods (individual, group and mass) to attain such objectives.

Currently, the Extension Section is responsible for the dissemination of cross-compliance rules/prerequisites to farmers and coordinates the National Rural Network (including the Cyprus European Innovation Partnership), FAS (see below) and farmers' training through seminars in the three District training centres (KEGE) as well as at the Head offices in Nicosia, with emphasis on the Young Farmers programme (seminars in which trainers are mostly Depts' employees with no additional fee, apprenticeship schemes and short courses).

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<sup>25</sup> District Offices: Larnaca (4 Beats); Limassol (6 Beats); Nicosia (8 Beats); Paphos (8 Beats); Famagusta (1 Beat); and, Pistilia (4 Beats).

The District Offices (esp. 'beats') comprise the first-line extension workers (officers). Officers operate on the basis of 'traditional agricultural extension' in the sense that they are in, more or less, close contact with farmers. Therefore,

farmers make requests and the extension staff either responds to the query - provides a solution to the problem, or addresses the Dept's (or Ministry's) specialists and laboratories (if, for example, further analyses are required); following, the results are fed back to farmers along with certain recommendations (relating, for example, to the results of an soil and/or leaf analysis

extension officers make all kinds of public announcements (posters at office, SMS to farmers and telephone calls to producer groups, distribution of print materials produced by the Section, etc.) and organize meetings (individual or group, using various audiovisual aids) in the framework of their extension programmes (if necessary in the evenings as well, i.e. beyond official working times) which relate to local needs and the National Rural Development Plan. They also monitor the implementation of various measures/projects relating to the NRDP/CAP and make relevant controls, run the KEGE as well as experimental/demonstration plots, assist in the establishment of farmer groups, are responsible for the certification of seed production and so on.

The most important knowledge sources for the Section are the university, public research, public authorities and the internet. The service cooperates with all kinds of actors.

Records of advisory work are kept in District Office and they are uploaded to a computer software programme which is monitored by the Extension section at Head Offices; no rewards are foreseen beyond the officers' salaries (even their engagement in the training courses held in KEGE does not result in any kind of extra remuneration).

The Section prepares a strategic plan, known as "Annual Extension Programme", including objectives to be pursued and targets to be accomplished based on the identification of local needs and the solutions identified. The programme/plan is designed by representatives of the Sections of the Dept. of Agriculture, District Offices. The progress achieved is checked and evaluated at local and district levels, as well as at the Section's headquarters through personnel follow-up, regular

district meetings and detailed reports. Revision/adaptation of the programme is undertaken whenever needed.

The service employs all known 'traditional extension' methods, i.e. individual (personal and telephone contacts, including SMS), group (demonstrations, public talks, educational excursions, short training courses) and mass (radio programmes, press articles/releases, leaflets and bulletins, posters, circular letters, etc.; a quarterly agricultural magazine of the Ministry known as Countryman is also published and circulated). Additionally, training courses for farmers are offered at the local training centres (KEGE).

The service's needs focus on the enhancement of cooperation and networking with knowledge and innovation sources (such as Universities and research centres) with the establishment of frequent exchanges of information between such organisations. In this respect, the safeguarding of funding in order for advisors to continuously update their knowledge and skills is a further major concern. Recently, the Department of Agriculture, acknowledging the need for further developing the skills and techniques of its Extension workforce, has encouraged their participation in the competence development programme CECRA.

Finally, digitization (along with a functional AKIS) is seen as an opportunity in terms of enhancing the impact of Extension on the Cypriot farming.

## 4. The agricultural and forestry advisory service(s)

### Introduction:

The survey was based on the instrument (questionnaire) developed by the University of Hohenheim in consultation with project partners; the questionnaire was then translated into Greek by the AUA team. Following, based on the country's AKIS diagram 'representatives' of the main providers of advice to farmers (private advisory/consultancy companies; freelance advisors/consultants; input shops; cooperatives<sup>26</sup>; Development Agencies; and, Extension Section of the Dept of Agriculture (DoA), Ministry of Agriculture, Rural Development & Environment) were conducted (through the Extension Section, DoA) and asked to contribute to the survey (i.e. to visit the questionnaire at <https://ec.europa.eu/eusurvey/runner/i2connectAKISsurvey?surveylanguage=EN#page0> and respond to the questions). Both the Extension Section, DoA and the AUA team provided assistance whenever needed. Overall 17 questionnaires were completed covering, more or less, all areas of the country<sup>27</sup>.

### 4.1. Overview of all service suppliers

As seen in the previous sections, the Cypriot AFKIS is rather strong and integrated. Therefore one can find the Extension Section, DoA playing a dominant role with other entities providing farmers with all kinds of advice as well.

In this respect for the present study representatives from all kinds of providers were sought. The providers who participated in the survey are depicted in Figure 1<sup>28</sup>.

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<sup>26</sup> In Cyprus farmers Unions are affiliated to the political parties.

<sup>27</sup> To secure that at least 3 providers from each category would respond to the on-line questionnaire we got in contact with 19 providers across the country.

<sup>28</sup> The numbers of different categories of providers in the Figure are not representative of the presence of these categories across the country.

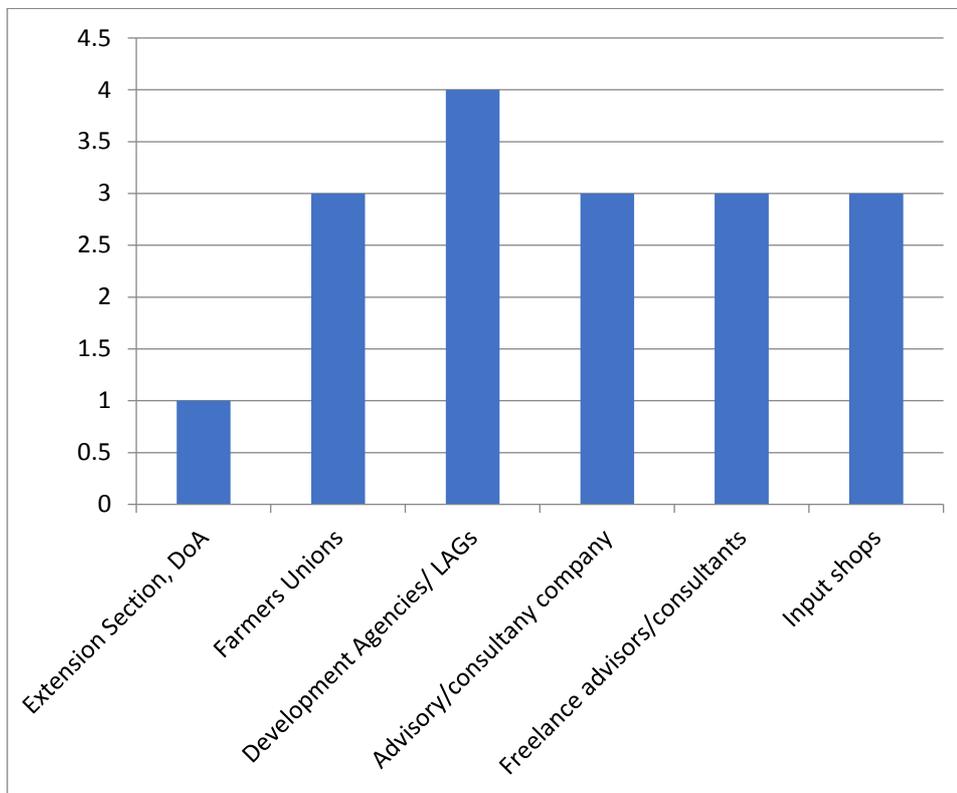


Figure 1: No of participants in the survey per category of advice provider

All providers work at national level with the exception of Development Agencies/LAGs, one of the freelances and one of the input shops

## 4.2. Public policy, funding schemes, financing mechanisms, advisory service providers

In Cyprus, the Extension Section of the Dept of Agriculture is a long-lasting, strong mechanism supporting farmers and farming. The support provided to farmers is free.

Cost-recovery from farmers (fee for service financing) is the common source of funding for advisory/consultancy companies and freelance advisors/consultants. Development Agencies/LAGs are funded mainly through EU and national/regional projects while in the case of Farmers Unions (cooperatives) the cost is mainly covered by membership fee/levy. Some among the providers may also be involved in (and funded by) EU and national projects. Finally, farmers have access/buy 'free' advice through/along with the purchase of inputs one buys from input shops which play an important role in the Cypriot agriculture.

Among advisory providers, half of the Development Agencies, the majority (2 out of 3) of the farmers unions and advisory/consultancy companies and one (out of 3) of the freelance advisors claim that their budget has increased or decreased more than 10% in the last 3 years. Increase is mentioned by the Development Agencies and Farmers Unions due to the increased demands for their services<sup>29</sup>. On the contrary, both the abovementioned companies and freelancers providing advisory/consultancy services notice decreases in their budgets due to the economic crisis (in the beginning of the 2010s) and the steadily decreasing employment in agriculture.

### 4.3. Human resources and methods of service provision

#### *Human resources*

The number of employees in advisory/consultancy companies range between 2 and 5 (average: ca. 4) out of whom around 3 are advisors (ranging between 2 and 4); on average 1 woman work as advisor. Farmers Unions<sup>30</sup> employ on average 7 persons (ranging between 5 and 8 persons) out of whom 4 are advisors (ranging between 2 and 10); on average 1 woman works as advisor. Development Agencies employ on average 6 persons (ranging between 5 and 7 persons) out of whom around 5 work (range: from 4 to 7) as advisors; on average almost 2 women work as advisors. The DoA is by far the largest provided employing 420 persons out of whom 24 are advisors; 10 advisors are women.

Among the 3 interviewed freelancers there is no woman.

Half of the Development Agencies along with one input shop/company declare increases in their personnel in the past 5 years owing to the increase of their clients; one Farmers Union also stated increase but this owes to the bureaucracy of the CAP. On the contrary, the Extension Section, DoA, personnel decreased since the retired personnel was not replaced (a consequence of the recent economic crisis in Cyprus).

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<sup>29</sup> The covid-19 pandemic is mentioned by 1 Farmers Union as a trigger to the increase of farmers' demand for services.

<sup>30</sup> In the categories of organizations that follow advisors may well be confused with agronomists working in the organization.

As far as back-offices are concerned the DoA (32 persons), the Development Agencies (average 2 persons each), two of the Farmers Unions (average 5 persons each) as well as 1 of the advisory/consultancy companies (2 persons) and 1 input shop/company (1 person) claim to occupy personnel in such a task.

### ***Education level of advisors***

In all cases advisors have a bachelor (3-4 years of studies) or an agronomist/engineer degree (5 years of studies). Some (i.e. 1 advisory/consultancy company and 1 input shop/company) also employ 'Vocational school/Practice-oriented technical training' graduates.

Higher qualifications are mainly found in the extension Section, DoA, (1 PhD and 23 MSc) and input shops/companies (average: 5 MSc<sup>31</sup>), followed by Development Agencies (average: 2 MSc<sup>32</sup>) and advisory companies and Farmers Unions (average: 1.5 MSc in their personnel).

The 3 freelancers interviewed hold the agronomist/engineer degree.

In only 2 cases (1 advisory/consultancy company and 1 Farmers Union) it was said that in order to hire someone organizations relevant experience is required while 1 input shop/company said that candidates are trained by the company.

### ***Professional experience in years***

In all the input shops/companies most advisors have experience ranging between 3 and 10 years (on average: 12, which is double the numbers of the more experienced advisors (average 6) who, in turn, are double the numbers of inexperienced – experience up to 3 years – advisors who are, on average, 3 in each company). The same holds true, more or less, also for Development Agencies (2.5 vs. 2 vs. 1.75, respectively) and Farmers Unions (3 vs. 1.5 vs. 0.5 respectively).

On the contrary, all advisors in the Extension Section and all but one in advisory/consultancy companies are experienced (i.e. more than 10 years work as advisors). This is especially problematic for the Extension Section, DoA, due to the abovementioned restriction in hiring new personnel.

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<sup>31</sup> Data from 2 out of 3 input shops/companies.

<sup>32</sup> Data from 3 out of 4 Das.

Finally, all freelancers are experienced (> 10 years).

### ***Advisory certification***

None of the providers claimed to have (as an organization or its employees/advisors) any Advisory Certification. The mentioned companies/organizations' certifications mainly imply the entitlement for running/participating in Measures of the National Rural Development Programme.

The only other staff certifications mentioned concern cross-compliance (3 cases).

## **4.4. Clients and topics**

### ***Clients***

All advisory providers serve quite a number, each, of client groups; only in the case of two of the Development Agencies the clientele is up to three categories, i.e. somewhat clearly defined. Almost all (15 out of 17) providers support 'farmers with small/medium-scaled farms'; 'young farmers' and/or 'new entrants' (14 and 13, respectively); and, 'farmers with large commercial farms' (12). More than half of the providers support 'producer groups', 'SMEs', 'part-time farmers' (12 each), women farmers (11) as well as 'semi-subsistence farms' and 'advisors/consultants' (10 each). On the other hand, very few providers support 'farm workers' and 'forest owners/mangers' (4 and 2, respectively).

All Development Agencies support both 'advisors/consultants' and 'SMEs'. There is no obvious relationship between client group and advisory activities/topic since, as abovementioned, client groups do not differ radically between advisory providers.

### ***Topics***

As seen in Figure 2 (below) the advisory topics are most demanded by clients are: 'rural development support and diversification' (14); 'support with grant application and compliance with regulation and standards' (12); 'entrepreneurship and farm management' (10); 'agri-environmental stewardship measures and nature conservation' (12); and, 'production technologies' (6).

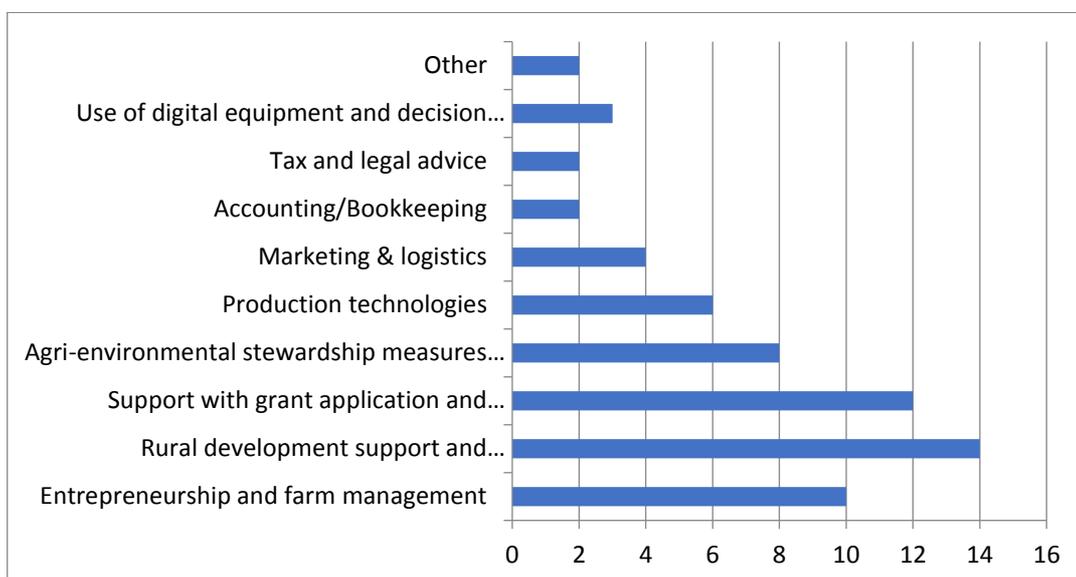


Figure 2: Most demanded, by clients, advisory topics

It is clear that ‘production technologies’ is not a topic for which farmers would ask Development Agencies which are mainly consulted for ‘rural development support and diversification’ (all DAs) and to a lesser degree for ‘entrepreneurship and farm management’ (3 out of 4). ‘Rural development support and diversification’, ‘support with grant application and compliance with regulation and standards’ and ‘agri-environmental stewardship measures and nature conservation’ is the common topics for which farmers ask all Farmers Unions. ‘Rural development support and diversification’, ‘support with grant application and compliance with regulation and standards’ is an important topic for which all but one advisors/consultants (either companies or freelancers) are asked followed by ‘entrepreneurship and farm management’ (4 out of 6). ‘Production technologies’<sup>33</sup> is thus a topic largely addressed to input shops/companies and the Extension Section, DoA, followed by Farmers Unions (2 out of 3).

The number of clients ranges between 20 and 4,300 farmers. The Extension Section, DoA, claims 4,300 farmers/clients followed by freelancers who claim 100 clients each and advisory/consultancy companies with an average of around 50 clients (ranging from 40 to 60<sup>34</sup>). The data for Development Agencies are not consistent as they address different clientele (municipalities, etc.)<sup>35</sup>.

<sup>33</sup> Including guidelines on the use of inputs farmers buy from input shops.

<sup>34</sup> Data are available only for 2 out of 3 providers.

<sup>35</sup> Farmers Unions (claiming that they serve all those who ask for advice) and input shops/companies have not provided relevant data.

Advisory activities revolve mainly around ‘enhancing access to resources (inputs, financing)’ (13 out of 17 providers) and ‘consultancy and backstopping’ (12 providers), followed by ‘training and capacity building’ (11 providers), ‘creating awareness and facilitating exchange of knowledge’, ‘networking/facilitation/brokerage’ and ‘providing support for the design and enforcement of laws and regulations for agricultural innovation’ (10 providers each).

‘Creating awareness and facilitating exchange of knowledge’ and ‘enhancing access to resources’ are common activities for all Development Agencies, followed by ‘networking/facilitation/brokerage’ and ‘providing support for the design and enforcement of laws and regulations for agricultural innovation’ (3 out of 4 each).

‘Creating awareness and facilitating exchange of knowledge’, ‘networking/facilitation/brokerage’, ‘enhancing access to resources’, ‘training and capacity building; and ‘providing support for the design and enforcement of laws and regulations for agricultural innovation’ are common activities for all Farmers Unions.

‘Creating awareness and facilitating exchange of knowledge’, ‘consultancy and backstopping’, ‘networking/facilitation/brokerage’ and ‘enhancing access to resources’ are common activities for all advisory/consultancy companies while ‘consultancy and backstopping’ is the main activity of all freelance advisors/consultants.

Outsourcing is mentioned in seven cases. Three of the Development Agencies and an input shop/company use external experts for spatial and building plans, while in another three cases (a private advisory company, a Farmers Union and the Extension Section, DoA) use external experts for business plans and feasibility studies.

### *Advisory methods*

Face-to-face advice on the farm was mentioned by all the interviewees (17 out of 17) followed by face-to-face advice outside the farm and advice via telephone (13 and 12 providers, respectively). When Individual advice via digital apps is added (5 cases), all individual methods account for almost half of the methods mentioned by all providers. Group methods and mass media account for 41% and 12%, respectively, of the advisory methods mentioned. The use of digital tools is rather

restricted (less than 25% of the methods mentioned by providers). It is characteristic that traditional mass media (printed, RTV and the like) were more often mentioned than digital ones; digital tools also account for less than 1/3 of the group methods mentioned by providers. All freelancers along with the majority of input shops/companies and advisory/consultancy companies do not use any digital tools. The Extension Section, DoA, uses the widest range of advisory methods.

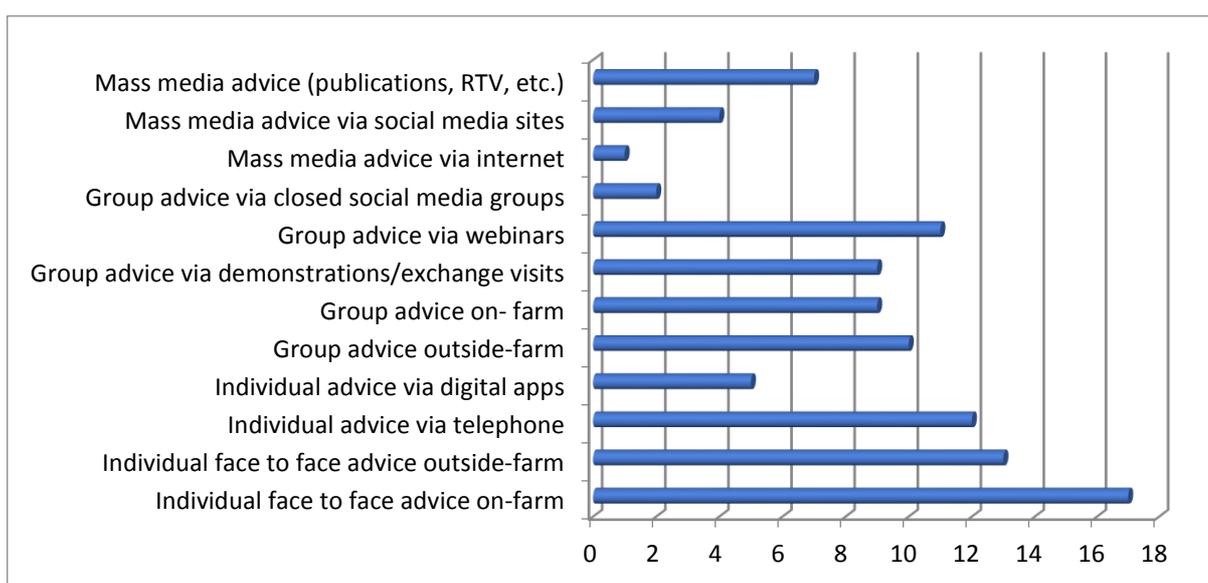


Figure 3: Most frequently used advisory methods

Individual methods, while are the most used ones among all providers (>55%), predominate among freelancers and input shops/companies (>80%). Group methods are used by advisory/consultancy companies much more than by freelancers (33% vs. 12%, respectively); Farmers unions also use group methods quite extensively (22%) as compared to other providers (>11%). Mass media are mostly used by the Development Agencies and the Extension Section, DoA (>20%) and Farmers Unions (18%) use mass media the most while other providers make minimal use (<10%) of them.

Almost one in three, i.e. 6 advisory providers (2 advisory/consultancy companies, 2 Farmers Unions, 1 Development Agency, and the Extension Section, DoA) state that the way to provide advice has changed due to the covid-19 pandemic. In most cases (4 out of 6) increased telephone contacts and digital technologies are reported as the means to provide advice replacing face-to-face contacts. In the

rest of the cases the suspension of face-to-face meetings (either individual or group) is mentioned.

## 4.5. Linkages with other AKIS actors/knowledge flows

As seen in Figure 4 (below) advisory/consultancy companies have very strong links with public administration (3<sup>36</sup>) and medium links with other similar companies (2.0); furthermore, they have weak-to-medium links with research and FBOs – professional organizations (1.67).

Freelancers, have rather strong links with public administration (2.67), medium-to-strong links with FBOs – professional organizations (2.33) and weak-to-medium links with advisory/consultancy companies (1.67).

Farmers Unions have strong links with public administration and other FBOs – professional organizations (3), medium links with advisory/consultancy companies (2) and weak-to-medium links with research (1.67).

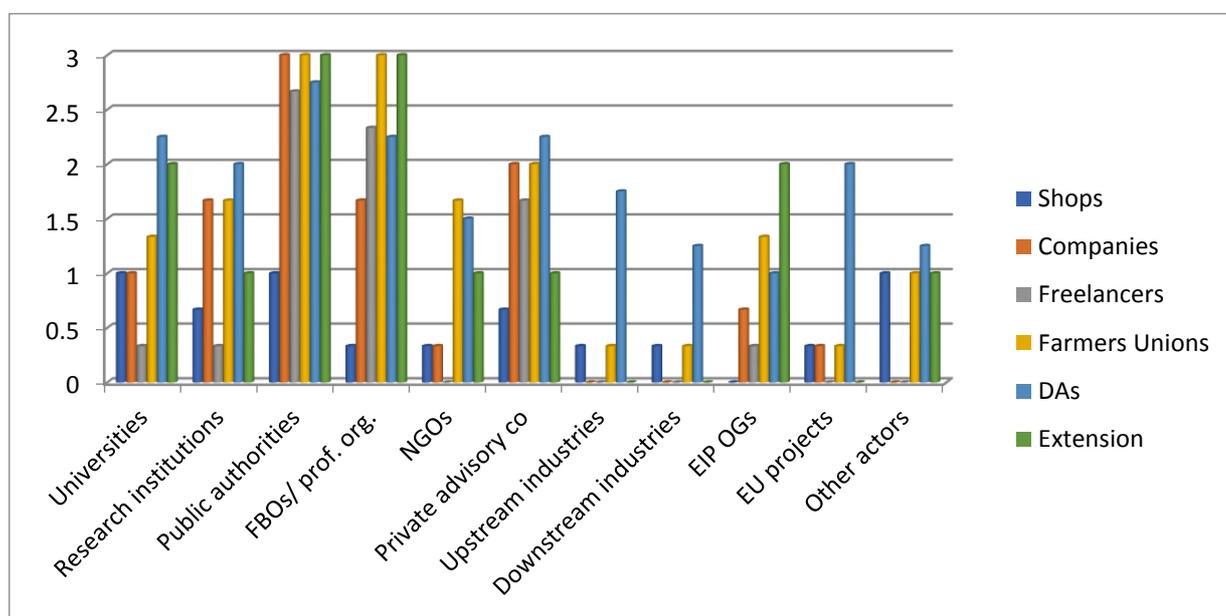


Figure 4: Degree of cooperation of advice providers with other AKIS actors

Memo: 0= no cooperation; 1= weak cooperation; 2= medium cooperation; 3= strong cooperation.

<sup>36</sup> For these calculations it is assumed that: no cooperation = 0; weak cooperation = 1; medium cooperation = 2; and, strong cooperation = 3.

Development Agencies have rather strong links with public administration (2.75) and medium-to-strong links with universities, FBOs – professional organizations and advisory/consultancy companies (2.25). they also have weak-to-medium links with upstream companies and NGOs (1.75 and 1.5, respectively).

Finally the Extension Section, DoA, has strong links with public administration and FBOs – professional organizations (3.00) and medium links with universities and EIP-OGs (2).

#### **4.6. Programming and planning of advisory work**

Two of the advisory/consultancy companies along with 1 Farmers Union, 1 input shop/company and the Extension Section, DoA, declared that they have staff development strategy. In most cases it concerns training/seminars on agricultural production along with quality and safety of produces; the Extension Section, DoA, said they focus on the CAP and relevant issues.

Only three organizations (1 advisory company, 1 DA and the Extension Section, DoA) said that they have a trainer/training unit with their staff mainly attending courses provided by the Human Resources Development Authority of Cyprus (AnAD). In another two cases it was mentioned that employees can proceed to further training/education on their own initiative.

In all cases training is said to last between one and two weeks. No incentives promoting attendance were mentioned.

##### ***Time allocation for advisory work***

While advisory/consultancy companies and Farmers Unions mostly provide targeted services (55% and 50%, respectively; see Figure 5), the Extension Section, DoA, focuses on 'information dissemination - face to face, via digital tools' (70%). Teaching and training activities are mainly embraced by the Extension Section, DoA, and the DAs (15%, and 17%, respectively) with these two organizations also being involved to quite some degree in other tasks, that is, administrative/bureaucratic tasks.

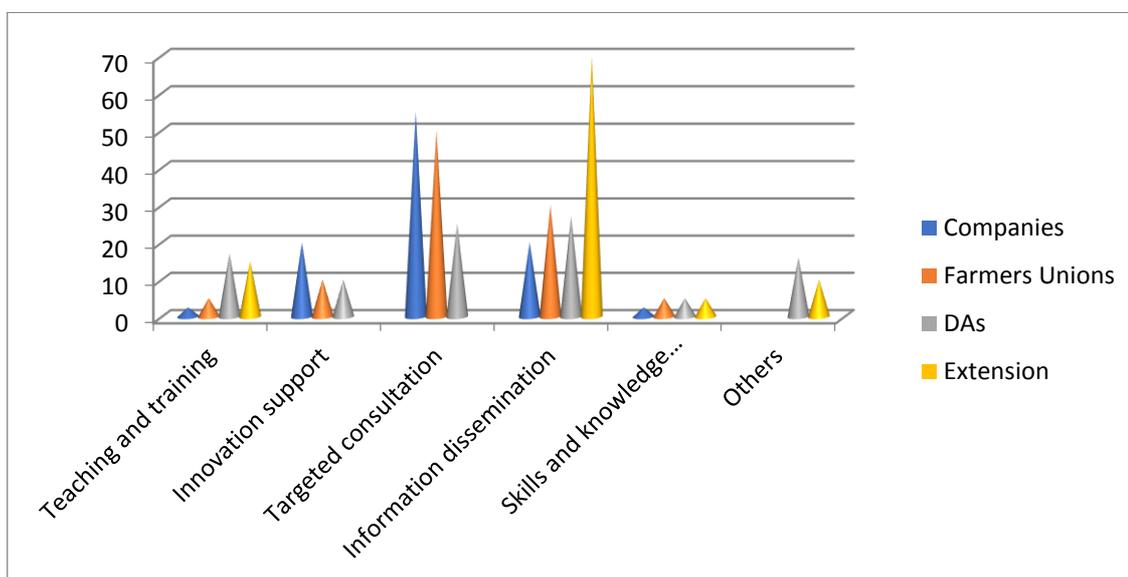


Figure 5: Allocation of advisors' time (%) in various activities

Finally, 'skills and knowledge development' are equally low for all providers (5%).

#### 4.7. Advisory organisations forming the FAS and evaluation of their FAS implementation

Overall, 9 among the 17 interviewed organizations (the Extension Section, DoA, all the Farmers Unions, 2 out of 2 companies, 2 out of 4 DAs and 1 input shop/company) state that advice concerning the cross-compliance requirements (re: EU-FAS) is embedded in their other advisory activities<sup>37</sup>.

<sup>37</sup> See: Koutsouris, A. (2014) 'Failing' to implement FAS under diverse extension contexts: a comparative account of Greece and Cyprus. In: *Farming systems facing global challenges: Capacities and strategies - 11<sup>th</sup> European Farming Systems Symposium*, Berlin (1-4 April 2014); [http://ifsa.boku.ac.at/cms/fileadmin/Proceeding2014/WS\\_1\\_8\\_Koutsouris.pdf](http://ifsa.boku.ac.at/cms/fileadmin/Proceeding2014/WS_1_8_Koutsouris.pdf)

## 5. Summary and conclusions

In Cyprus, the AKIS comprises the Dept of Agriculture, the Ministry of Agriculture, Natural Resources & Environment (mainly its Extension Section), and ARI (the Agricultural Research Institute), the newly established Cyprus University of Technology, private consultants and private (input) shops/companies, Farmers Unions, Development Agencies (LEADER LAGs) and, of course, producers groups and individual farmers.

In terms of knowledge generation ARI, through its applied research, predominates given that the university has only recently started to play some role; neither institute has mechanisms to disseminate knowledge to farmers. An important fact (confirmed by both ARI and the University) is that (very few) farmers have recently started to ask for specialized information and fund small-scale projects (mainly product analyses).

New knowledge and technology is also imported or generated (experimental plots) by private input companies (input shops). In terms of knowledge dissemination the Extension service (comprising the Extension Section, the District Offices and beat extension workers) predominates. Private companies' agronomists as well as Producer Groups' (esp. of the ones applying quality systems) and Farmers Unions' agronomists also contribute to the transfer of knowledge and technology to farmers. Finally, farmer-to-farmer dissemination plays an important role in a small country such as Cyprus.

Despite the fact that there is not any specific policy framework or formal agreements between the AKIS actors, the Extension Service covers, as a coordination mechanism, more or less, actors' bonding needs. The service is, for example, in contact with Producer Groups and Farmers Unions as well as with individual farmers through District Offices and beats extension officers; therefore, a two-way communication mechanism between the Extension Section and farmers is, despite shortcomings, long ago established and still working. Important in this respect is the knowledge produced by innovative farmers who produce adapted knowledge (esp. on new crops or varieties) since they inform or ask for advice from the District Offices which, in turn inform (or ask for help from) the Extension Section and, generally, the Division of Agriculture.

Furthermore, the Extension Section cooperates with ARI in putting together its annual extension programmes (which the Section monitors) as well as in defining research needs. On the other hand, ARI staff actively participates in the service's educational activities and tries (although without a relevant section/staff or funds) to grasp farmers' problems.

Missing links may be identified between private (input) companies and the extension service as well as between private advisors/consultants and the service (i.e. beyond legal matters). Nevertheless, informal links (occasionally) exist at district and local level.

Given the fact that: a) the Extension Service as a result of the country's accession into the EU (2004) has increasingly undertaken bureaucratic tasks thus retreating from its educational role – a situation further aggravated by restrictions imposed by the Troika due to the economic crisis; b) the decreasing interaction of ARI with farmers; and c) both ARI and the Cyprus University of Technology are largely dependent on participation in EU-funded projects which nevertheless do not, more or less, correspond to the needs of the Cypriot agriculture, while, at the same time, d) are both largely oriented towards publications in scientific journals, the need for more intensive cooperation between all the actors concerned (with the lead of the Dept. of Agriculture/ Extension Section) underlined by all the actors in Cyprus is not surprising.

Concerns are also expressed about the adequate staffing of the Extension Section, and more generally of the Dept. of Agriculture, which along with the pressure for the restructuring (downsizing) of the public sector by the Troika, resulted in the downgrading of extension/advisory work in Cyprus; privatisation does not seem to be a viable option for Cyprus due to the extremely small scale farming (and other structural characteristics of the sector) in the country. The updating of extensionists' knowledge (including extension methodology) has been put forward.

Most of the published papers refer, albeit rather indirectly, to the positive role of the Extension Service in Cyprus. Examples include papers addressing agricultural marketing cooperatives (Andrew 1975, 1976a and b) in which the positive role of extension in relation to the improvements of quality of produces for the market as well papers addressing the issue of irrigation (a major problem in the country) and land consolidation (Van Tuijl, 1993; Cornish, 1998; Phocaides, 2002; Markou

and Stavri, 2005; Socratous, 2011), ruminant production (Morphakis, 1999 and, focusing on artificial insemination, Papachristoforou and Tzamaloukas, 2012) and the Young Framers programme (Aristides, 1995). Descriptions of the structure and functions of the Extension Section of the Department of Agriculture are found in World Bank (1985), Neocleous (1995), Morphakis (1999), Charalambous-Snow (2010) and Charalambous-Snow and Ingram (2011). Identification of constraints is included in World Bank (1985), Neocleous (1995), Morfakis (1999), Markou and Stavri (2005), Charalambous-Snow (2010) and Charalambous-Snow and Ingram (2011) as well as in Phocaides (2002) in relation to irrigation and CerOrganic (undated) in relation to organic farming. The constraints identified, are more or less, the abovementioned ones, i.e. the increasing time allocated by the service to regulatory work; the inadequate numbers of extensionists; the targeting of the increasing numbers of part-time farmers and women; the need to bridge the gap of trust and confidence on the part of the farmers; the training (knowledge and skills, including communication methods, ICTs, marketing, producer groups) and motivation of the extension staff; the marketing of the section's own activities (including communication activities) and the general awareness of the service on new developments (including cooperation with various services and private actors, the Agricultural Research Institute and the newly established University of Technology; and, updating knowledge on extension systems per se with emphasis on participatory and demand-driven extension and interactive innovation).

Despite interesting proposals such as: a) the establishment of a network of experimental plots (collaborative experiments) all over the countryside in order, on the one hand, to generate, adapt and disseminate (through farmer-to-farmer extension processes as well) innovations and, on the other hand, to focus more on farmers' needs and b) the enhancement of farmers' occupational training (with emphasis on experiential learning), farmers have, on their part, to become more entrepreneurial as well as more open and willing to share their know-how with their colleagues; farmers' unwillingness to pay for advice (since currently they do not) may be a further obstacle insofar as private services will become an important source of advice.

## 6. Acknowledgement of partners, information sources and gaps

The AUA team wishes to acknowledge the cooperation, on the one hand, of the Extension Section, Dept of Agriculture, Ministry of Agriculture, Rural Development and Environment, esp. of *Dr Efi Charalambous-Snow* (Head of Agricultural Extension) and *Mr Periklis Athanasiou* in assisting with the AKIS interviews and survey<sup>38</sup> and reviewing parts of the report and, on the other hand, of the interviewed key-persons concerning the Cypriot AKIS as well as of the advice providers who responded to our call to answer the on-line questionnaire.

### List of key-interviewees

1	Dr Efi Charalambous-Snow - Head of Agricultural Extension, DoA
2	Dr Dimitris Tsaltas – Professor at the Cyprus University of Technology
3	Dr Dora Chimonidou – Director of ARI

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<sup>38</sup> The Cypriot colleagues not only provided all necessary information and documentation but, additionally, immediately responded to queries and were in continuous contact (via skype, emails and telephone calls) with the research team.

List of survey participants

	<b>Advisory/ consultancy companies</b>
1	QUALITYCERT LTD, QUALITYCERT@CYTANET.COM.CY
2	AGROCERT LTD, <a href="https://cyprusregistry.com/companies/HE/169572">https://cyprusregistry.com/companies/HE/169572</a>
3	does not wish to disclose his/her data*
	<b>Freelancers – advisors/consultants</b>
4	ANTONIS NIKOLAOU, anikolaou1@yahoo.com
5	K.EL.N. Agrofood Ltd
6	AGROPLUS CONSULTANTS LTD, <a href="mailto:agroplus@cytanet.com.cy">agroplus@cytanet.com.cy</a>
	<b>Input shops/companies</b>
7	L. Lambrou Agro Ltd, <a href="http://www.lambrouagro.com.cy">www.lambrouagro.com.cy</a>
8	Technomichaniki S.A., <a href="http://www.technochimiki.com.cy">www.technochimiki.com.cy</a>
9	does not wish to disclose his/her data*
	<b>Farmers Unions</b>
10	PANAGROTIKOS Association of Cyprus, <a href="https://www.panagrotikos.org.cy/">https://www.panagrotikos.org.cy/</a>
11	EKA (Union of Cypriot Farmers), <a href="mailto:eka.agroton@cytanet.com.cy">eka.agroton@cytanet.com.cy</a>
12	PEK (Pancyprian Farmers Union), <a href="http://www.polignosi.com/cgibin/hweb?-A=8450&amp;-V=limmata">http://www.polignosi.com/cgibin/hweb?-A=8450&amp;-V=limmata</a>
	<b>Development Agencies/ LAGs</b>
13	Development Agency of Troodos, <a href="http://www.anetroodos.org">www.anetroodos.org</a>
14	Larnaca and Famagusta District Development Agency, <a href="http://www.anetel.com">www.anetel.com</a>
15	Development Agency of Pafos ‘Aphrodite’, <a href="https://anetpa.com.cy/">https://anetpa.com.cy/</a>
16	Development Agency of Limassol, <a href="https://www.anelem.com/anelem-home/">https://www.anelem.com/anelem-home/</a>
17	<b>Extension Section, Dept of Agriculture,</b> <a href="http://www.moa.gov.cy/moa/da/da.nsf/index_gr/index_gr?opendocument">http://www.moa.gov.cy/moa/da/da.nsf/index_gr/index_gr?opendocument</a>

\* Data known at the AUA team

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# AKIS and advisory services in *Czech Republic*

## Report for the AKIS inventory (Task 1.2) of the i2connect project

*Date: December, 2020*

**Author:**

Marta Mrnušík Konečná

Contact: [konecnamarta@gmail.com](mailto:konecnamarta@gmail.com)

Project funded under the Horizon 2020 Research and Innovation Programme under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION' HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

This report represents an output of the i2connect project. It is one of the country reports that were produced in the year 2020 by project partners and subcontractors for compiling an inventory of Agricultural Knowledge and Information Systems. AKIS describe the exchange of knowledge and supporting services between many diverse actors from agriculture and forestry sector in rural areas. AKIS provide farmers and foresters with relevant knowledge and networks around innovations.

The main aim of the report is to provide a comprehensive description of the Agricultural Knowledge and Information System (AKIS) in the Czech Republic, with a particular focus on advisory services in agriculture and forestry. The description includes history, policy, funding, advisory methods, main actors and a section based on survey among the providers of advice. The report updates and expands the PRO-AKIS country report of 2013/2014.

In the Czech Republic, agriculture areas cover approximately 4,203,700 thous. ha of land, i.e. 53,3% of CR area (MZe, 2019a). In the agricultural holdings structure, there is a high share of legal entities with average area 529 ha of agriculture land. While for the natural persons, it is only 26 ha. In addition, 69.3% of land is managed by 10.0% of legal entities, while natural persons, who make up almost 90% of all entities, manage only 30.7% of the land. Agricultural land is mostly rented.

Forest lands currently cover an area of 2,675,670 ha, which represents 33.9% of the total area of the state. The largest share of forests in terms of area (47%) is managed by the state enterprise Lesy České republiky (LČR). This fact strongly influences the advisory services in this sector.

Advisory knowledge and information system in the Czech Republic can be described from more points of view. One of them is strategy point of view, it comprises of 4 levels: Introduction consultation; Professional consultation and Special advisory services; Individual advisory service; Providing information. The other is from the fund point of view, it can be divided into state organizations, state-contributed organizations (Institute of Agriculture Economics and Information, Paying agency), semi-state-funded organizations (Universities,

research institutes), farmer based organizations, NGOs, private advisory organizations (including organization with advisory component and new organization based on the European and national support (Demonstration farms, Technological platforms, Operational groups, etc.). Thanks to the strong EU initiative, the Czech AKIS is developing dynamically.

The results of the survey confirm the outcomes of previous researches and report from PRO-AKIS project. The advisors mostly use face to face methods for giving advice mainly in farms. The personal linkages (of schoolmates) are an additional benefit.

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## Abbreviations

AO	Advisory organization
AKIS	Agricultural Knowledge Information/Innovation System
AOPK	Agentura pro ochranu přírody a krajiny (eng. Nature Conservation Agency of the Czech Republic)
CR	The Czech Republic
CAP	Common Agricultural Policy
EU	European Union
FAS	Farm Advisory Services
FBO	Farmer Based Organization
IAEI	Institute of Agricultural Economics and Information
IAFI	Institute of Agricultural and Food Information
LČR	Lesy České republiky (eng. Forest of the Czech Republic)
LPIS	The Land Register by User Relations
MZe/MoA	Ministerstvo zemědělství (eng. Ministry of Agriculture)
MikroAKIS	Farmer personal network of advisory providers
NGO	Non-Government Organization
OWAS	Organizations with advisory component
RDP	Rural Development Plan
SME	Small and Medium Enterprise
VÚMOP	Research Institute for Soil and Water Conservation
VÚRV	The Crop Research Institute
ZPF	Zemědělský půdní fond (eng. Agricultural Land Fund )

## 1. Main structural characteristics of the agricultural and forestry sector

The Czech Republic (CR) belongs to the temperate climate zone, there is a mixture of coastal and continental climate. The long-term precipitation normal (1981-2010) is 686 mm per year, in 2018 only 522 mm of precipitation fell. The Czech Republic has an area of 78,867 km<sup>2</sup>, of which the Agricultural Land Fund (ZPF) in 2018 accounted for more than half of the total area of the Czech Republic (53.3%), compared to 2017 it decreased by 1.6 thous. ha. The whole agricultural area is divided into 10 916 thous. land plots with an average area of 0.39 ha. Arable land accounts for 37.6%, recorded a slight decrease of 0.2% and a slight increase was identified in permanent grassland by 0.5%, the area of which is represented by 12.72% of the land. The area of forest land remained approximately the same as in 2017, i.e. 33.9%. In the Land Register by User Relations (LPIS) there are about 339 thous. soil blocks of agricultural land. Most of them are registered in the category up to 1 ha (85 thousand), then in the category 2–5 ha (50 thousand). (MZe, 2020a)

Forest lands currently cover an area of 2,675,670 ha, which represents 33.9% of the total area of the state. The largest share of forests in terms of area (47%) is managed by the state enterprise Lesy České republiky (LČR). Other state forests (Military Forests and Estates, National Parks, AOPK, etc.) occupy an area of approximately 10%. Another 19% of the total area of forest land is managed by private owners. (MZe, 2020a)

Employment in agriculture can be considered practically stable in recent years. In 2018, the number of employees in agricultural enterprises was about 100.2 thous. Their share in total employment in the national economy of the Czech Republic was 1.9%. (MZe, 2020a) The proportion of employees in the forestry sector is relatively small, standing at only 0.6% (Toth at all, 2019).

Rural municipalities (municipalities with less than 2,000 inhabitants) represent almost 89% of all municipalities in the Czech Republic, occupying almost ¾ areas of the state (72.5%), but they contribute significantly less to the total population (only about 27%). (MZe, 2020a)

## 2. Characteristics of AKIS

### 2.1. AKIS description

Advisory knowledge and information system in the Czech Republic can be described from more points of view. In this report, two of them will be described and illustrated by figures. The first one from the point of view of the official strategic documents and the other from the fund point of view.

According to the Conception of Advisory Services (MZe, 2016) and the Conception of Education (MZe, 2014), AKIS comprises of 4 levels (Education; Methodological transfer and research findings; Certification; Farm advisory system) related to the kind of providing services, however the services are related to each other. For the graphical illustration see Figure 1.

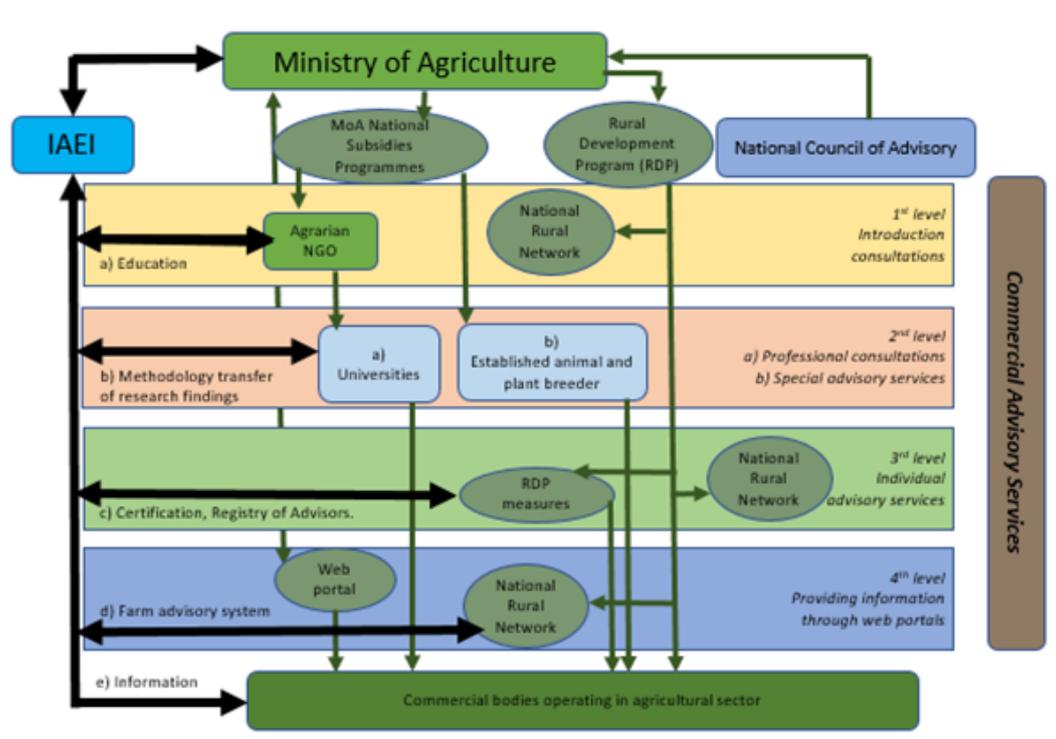


Figure 1: Advisory and Knowledge Information System in the Czech Republic (actualization of Pulkrábek, J., Pazdera, K. (2014) in Mrnušík Konečná (2018))

The supporting level is the Ministry of Agriculture (hereinafter referred to as the “MoA”), Paying agency and Institute of Agricultural Economics and Information (hereinafter referred to as the “IAEI”) which are responsible for the preparation

and implementation of rules (laws and subsidies). The first level - *Education and introduction consultation* - ensure the widespread awareness and knowledge base in the agriculture and forestry. The second level – *methodology transfer of research, professional consultation and special advisory services* – is represented by the research and education sector (universities and research institutes), which produce and transfer new knowledge into AKIS. The third level - *system certification and accreditation* - identify those who prove the state requirements on knowledge in the agricultural and forestry topics. The fourth level – *FAS and web portals* – provide actualities and information to wide range of clients.

The official bodies of the advisory system of the Ministry of Agriculture are the National Council for Advisory and Education for Agriculture and Rural Development and the Institute of Agricultural Economics and Information. The conceptual and managing body of the advisory system is a professional department of the Ministry of Agriculture, which is responsible for counseling. The task of this department is to create conditions for the provision of advisory services and to connect the professional activities of individual professional departments of the Ministry of Agriculture and the programs managed by them. To create a comprehensive system of counseling, the Ministry of Agriculture proposes and administratively provides support programs from national subsidies and further methodically directs and supports the activities of individual elements of the system. The National Council for Guidance and Education for Agriculture and Rural Development (hereinafter referred to as the "National Council") is an advisory and initiating body of the Ministry of Agriculture. The activities of the National Council are governed by the Statute and Rules of Procedure. The Ministry of Agriculture uses the provided recommendations, suggestions and comments of the members of the National Council for its activities and thus ensures the participation of representatives of professional and agricultural non-governmental organizations in the creation and setting of advisory and educational goals, procedures and evaluations. The Institute of Agricultural Economics and Information is a state-subsidized organization of the Ministry of Agriculture and its activities include education and counseling, among others. The Institute is responsible for keeping the Register of Advisors accredited by the Ministry of Agriculture and checking the accuracy of the data stated in it, administrative acts connected with the accreditation procedure and fulfilling the duties of an advisor, and also provides control activities for advisers accredited by the Ministry of Agriculture. If necessary, it organizes educational events for

lecturers and consultants of the advisory system of the Ministry of Agriculture and prepares methodological materials. To ensure this goal, it also coordinates the professional activities of scientific research institutions; The consulting activity of these institutions is an important means of transferring the results of science and research into practice. In the programming period 2014–2020, within the RDP operation 16.1.1 - Operational groups, the training department IAEI trains and consults selected innovation intermediaries (so called innovation brokers), whose task is to establish operational groups in the field of agriculture or food and to develop a joint project in cooperation with individual members of these groups.

From the fund point of view, AKIS can be divided into state organizations (Ministries, Paying agency, AOPK), state-subsidized organizations (Institute of Agriculture Economics and Information), semi-state-funded organizations (Universities, research institutes), Farmer based organizations, NGOs, private advisory organizations (including organizations with advisory component and new organizations based on the European and national support (Demonstration farms, Technological platforms, Operational groups, etc.). List of AKIS actors see in chapter 4.1.

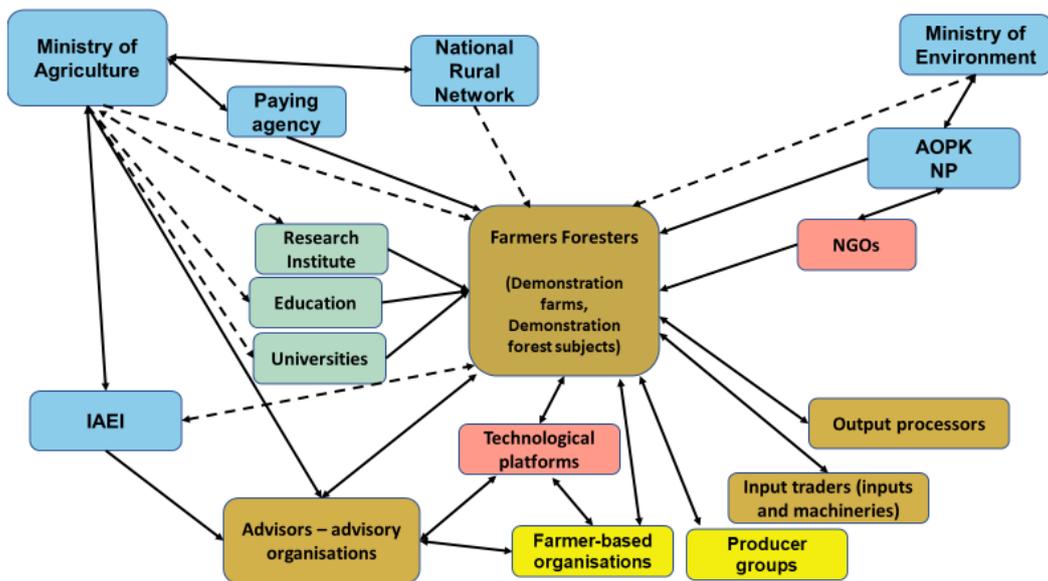
Thanks to the strong EU initiative and new technology boom, the Czech AKIS is in transition to ensure the spreading of new information and knowledge. MoA tends to subordinate the responsibility for quality of advisors supported from public money to organization closer to farmers. Therefore, the Institute of Agricultural Economic and Information went through the process of accreditation by Czech Accreditation Institute to get state accreditation rights. The process was finalized at the end of the year 2020. This change should facilitate flexibility of advisory environment.

The coordination of forest management is largely influenced by the fact that the state is the majority owner. The Ministry of Agriculture supports forest management in the form of services for forest owners and in the form of financial contributions. The services for forest owners include fire-fighting services, both aerial and terrestrial. Then there is the Forestry and Game Management Research Institute, which provides an advisory service, for example, in the field of forest protection, called the Forest Protection Service. Aerial liming and fertilizing are also included in the category of services.

Financial contributions from the MoA budget are provided for the restoration of forests damaged by emissions, skidding or dragging by horse and for processing forest management plans. In the area of game management, financial contributions are provided for users of hunting grounds and for breeding and training national breeds of hounds and birds of prey. (MoA, 2020)

In chapter 2.2, there is diagram of the Czech AKIS based on the analysis for new RDP (MZe, 2020a), the Country report AgriLink (Mrnušík Konečná et al., 2019), and the discussions with representatives of AKIS actors.

## 2.2. AKIS diagram



### Legend

- |  |                                    |
|--|------------------------------------|
| <span style="color: blue;">■</span> Public authorities                               | <b>—</b> Strong Linkage            |
| <span style="color: lightgreen;">■</span> Research and education organisations       | <b>- - -</b> Weak linkage          |
| <span style="color: brown;">■</span> Private sector (for profit)                     | <b>→</b> Unilateral knowledge flow |
| <span style="color: yellow;">■</span> Third sector farmer/farmer-based organisations | <b>↔</b> Bilateral knowledge flow  |
| <span style="color: orange;">■</span> Third sector NGO (non-profit)                  |                                    |

Figure 2: AKIS model

### 3. History of the advisory system

As mentioned in the Pro-AKIS report (Pulkrábek J., Pazderu K., (2014) “before 1990, farm advisory services practically did not exist in the Czech Republic. Professional activities were carried out by state farm and agricultural co-operative specialists. Information transfer and space for the exchange of experience were provided through district and regional consultation meetings of agronomists, zootechnicians, etc.

Advisory services, as we understand them in their present state, were established in the years 1990-1992. In view of large changes in ownership of land and farm buildings legislative advisory and solving of transformation problems prevailed in advisory services. At the same time, the subsidies granted by the Ministry of Agriculture since 1992 to the advisory services sector fulfilled several purposes. Initially they supported the establishment and future development of the advisory sector which did not exist at that time and the initial activities of the first specialist advisors. ... In 1999 the Ministry of Agriculture prepared, from existing experience, the Conception of farm advisory services. It was created as an instrument for system-based consultative activities and for regulating provisions of means from public sources on the base of sector advisory programmes. At the same time the necessity to disseminate information and spread non- commercial advisory services formulated the so-called advisory services in public interest provided by employers from agriculture sector research institutions. Later these people worked as methodologists in advisory systems. An important stage in the advisory system development was the provision of advisory assistance through advisory groups (1998-2002), widely accepted by the agricultural public and later highly appreciated in the following EU evaluations. The system led to the creation of a farmer association with the objective to solve similar production problems. ... After the Czech Republic joined the European Union advisory system was harmonized with EU law. The Council Regulation established new priorities for granting aid in the framework of CAP and led to the creation of a new Conception of Farm Advisory Services for the period of 2004-2010. The aim of that conception was to prepare the Ministry of Agriculture and the whole agriculture sector on obligatory establishment a complex agriculture advisory system from 1st January 2007, minimally for the scope of legal requirements relating to farm management with regards to proper agro-environmental conditions. ... A part of the implementing powers was delegated to the Institute of Agricultural and Food

Information (IAFI, after 2008 as IAEI), which was also charged, in addition to the function of an inspection authority (in cooperation with the Forest Management Institute) with the function of the operator of the Register of Consultants kept within the Ministry of Agriculture Registry of Advisers, and with performing administrative acts connected to the certification or accreditation of advisors. The requirements relating to the preparation of the advisers and the professional competence thereof were established by the Accreditation Directive of the Ministry of Agriculture in 2002.

The Ministry of Agriculture also established the broad National Council of Advisory Services for Agriculture and Rural Development as a consultative institution and used its keynotes, recommendations and remarks arising from regions and agri-business participants for the optimization of their decisions. On a regional level MoA supported the Regional Information Centers, mostly originated in the frame of NGO institutions for directing information flow to final users.

Conception put emphasis on the creation of advisory programmes and its realization. From 2004, advisory programmes were directed to the support of legal requirements in the sectors of water protection, animal welfare, transitional farming and organic farming methods, optimization of farming. The interest in the advisory services oriented in this way was constantly growing. “

In 2013, the Regional Agricultural Agencies were absorbed by Regional centers of Paying Agency. Nowadays, the main information sharing is provided by the farmer-based organizations, benefited from state and private sources.

Up to 2020, only personal advisors could be accredited.

In 2020, the IAEI got certification right and prepared the system of organization accreditation. The Organization accreditation is focus on approving process of the of the organization's advisory plan and its compliance.

## 4. The agricultural and forestry advisory service(s)

Resources for this chapter are based on the strategic document (mainly prepared for new CAP), opinions of the Czech experts (including representatives of government, advisors, researchers, academic, farmers) from the working group for Knowledge Transfer, research papers, and finally from the online survey among advisory bodies.

In the survey, we addressed 190 advisory bodies (only 20 responses came back). The 18 Advisory bodies are focus on agricultural topics and 2 Advisory bodies give advice for forest providers. The number of responses is not representative for the Czech Republic, however, the main results are in harmony with the strategic documents, research papers and experts' opinions.

The Czech Republic is consistent in its advisory environment in terms of rules and financial support.

### 4.1. Overview of all service suppliers

As mention in Chapter 2.1, according to fund point of view, the Czech AKIS can be divided into

- State organizations
  - o Ministry of Agriculture
    - National rural network
  - o Paying agency
  - o Ministry of Environment
  - o AOPK
- State subsidized organizations
  - o Institute of Agriculture Economics and Information
- Semi-state-funded organizations
  - o Universities,
  - o Research institutes
    - VÚMOP
    - VÚRV
    - others
- Farmer based organizations
  - o Association of private farmers
  - o Agricultural Association of the Czech Republic
  - o Agrarian Chamber

- Producers group
  - o Association of Oilseed Growers and Processors
- NGOs
  - o Czech Society for Ornithology
  - o Daphne or Juniperia
- Private advisory organizations
- Organizations with advisory component
  - o Supplier with advisory services or research department
  - o Private research organizations
- new organizations based on the European and national support
  - o Demonstration farms (supported from 2017)
  - o Technological platforms
    - Czech technological Platform for Agriculture (supported from 2016)
  - o Operational groups (supported in RDP)

The accredited advisors can be freelancers as well as employees of some of the organization listed above.

In general, in the farmers MikroAKIS (Mrnušík Konečná et al., 2019) the most frequent advisory service providers are the input and machineries suppliers (where the advice is included into the price of service), other are the peers, then the active accredited advisors and researchers.

In our survey we have 3 organisations with advisory component (including 2 private and 1 university); 3 advisory organisation (including 2 private and 1 research organization) and 14 advisors – freelancers (including 3 women and 11 men).

## **4.2. Public policy, funding schemes, financing mechanisms, advisory service providers**

There are two significant resources of funding scheme, the RDP measures and national subsidies.

### **RDP measures**

Particular RDP measures are M01 (Knowledge transfer and information events) and M16 (Cooperation). The measure M02 (Advisory services) was prepared, but never running by the Ministry of Agriculture.

### **M01 Knowledge transfer and information events**

The aim of the measure is to strengthen the knowledge base and support the transfer of knowledge in agriculture, food and forestry.

M01 is divided into two operations:

*1.1.1 Educational events*

*1.2.1 Information events*

### **M16 - Cooperation**

The common objective of the measure is to strengthen research, technological development and innovation, increase the competitiveness of small and medium-sized enterprises in the agricultural sector and aim to contribute to competitive agriculture, food and forestry and the sustainable development of natural resource management.

The M16 is divided into 6 operations:

*16.1.1 Support for EIP operational groups and projects*

*16.2.1 Support for the development of new products, processes and technologies in primary agricultural production*

*16.2.2 Support for the development of new products, processes and technologies in the processing and marketing of agricultural products (Food Innovation)*

*16.3.1 Sharing devices and resources*

*16.4.1 Horizontal and vertical cooperation between actors in short supply chains and local markets*

*16.6.1 Horizontal and vertical cooperation in the sustainable provision of biomass for energy production, food production and industrial processes*

## **The national subsidies**

The national subsidies offer the whole range of measures. The rules of national subsidies are described in Principles Setting the Conditions for the Provision of Subsidies for the Year 2020.

Particularly:

### **9.A Special advice**

- 9.A.a. *Special advice for animal production in relation to Act No. 154/2000 Coll. It is support for organization of seminars and training.*
- 9.A.b. *Special consultancy for crop production.*

**9.E. School competitions**

Support for the connection of practice and vocational education.

**9.F. Support for agricultural advice**

- 9.F.e. *Regional transfer of information*
- 9.F.i. *Professional consultations*
- 9.F.m. *Demonstration farms*

**9.H. Support for participation in international fairs and exhibitions abroad**

- 9.H.a *Support for participation in international fairs and exhibitions abroad under the auspices of the Ministry of Agriculture*

**9.I. Support for the improvement of practical training in productive fisheries**

**9.J. Improving practical training in beekeeping**

**10.D. Support for European integration of non-governmental organizations**

**10.E. Support of technological platforms within the competence of the MoA**

- 10.E.a. *Support of the Czech Technology Platform for Food*
- 10.E.c. *Support of the Czech Technological Platform for Organic Agriculture*
- 10.E.d. *Support of the Czech Technological Platform of Plant Biotechnologies (Plants for the Future)*
- 10.E.e. *Support of the Czech Technology Platform for Agriculture*

A detail description of subsidies is in the appendices.

In our survey, all organizations are receiving the „Cost-recovery from farmers (fee for service financing)“. Three organizations have “National/Regional government funds (public funds)“. One has „Contribution (membership fee)“. One organization receives funding for research project of innovation. Two organization increase their budget by expand to new regions or activities or by implementation of research/innovation on the farm.

### 4.3. Human resources and methods of service provision

Human resources in organisation get from the survey have in average 42 employees (including 19 women), in which 6 are advisors (including 2 women). 4 of 6 organizations have person in back-office activities (approx. 6 per organization).

The organisations with advisory services have significantly more of high educated advisors with PhD. degree (in range 1-9) than the advisory organisations (the range 0-1 of employee with PhD degree). Advisors from one organization must have the Integral forest cultivating, due to forest orientation of organisation.

Majority of advisors (30 from 37) have more than 10 years' experience.

Just for clarification, organizations as such are not certified, but their advisors are. In case the organization is small or almost everyone in the organization are certified (they have a certificate in their part) then it is considered certified (but it is not an official status). According to the new proposal for strategic plan CAP 2021+ (MZe, 2020a), it will be possible to certify the organization in the future, but the process has not started yet.

In our survey, all organizations have at least one accredited advisor (in average they have three accredited advisor per organization).

Three organizations have the staff development strategy.

One advisory organization have a trainer/training unit responsible for developing staff capacity. The training of advisors in almost all organizations are ensured by external education and training events. They attend the at least 4 days of compulsory trainings to keep the accreditation. One organization has one-month course for their advisors. In average it is 10 days per year per advisors.

One organisation has reward system for their advisors according to the economic results.

From our 6 organizations in the survey, only 4 organization were evaluated for this question of proportion of time dedicated to the advisory activities, one

organisation do not fill-in the question and one organisation spread only 30 % of its capacity.

From 4 evaluated organization, the most frequent area of advice are “Information dissemination (face to face, via digital tools)” and “Targeted consultation services (business plans, credit/subsidy application, etc.)”

#### 4.4. Clients and topics

The number of clients vary from 2 to 50 for freelancers and from 50 to 120 clients for organizations. In average the freelancer has 20 clients and organizations about 80 clients. Clients have long-term contracts, so the number of newly concluded contracts varies in units per year.

The most frequent target groups are “Farmers with small/medium-scaled farms” following by “Farmers with large commercial farms (>100ha)” and “Small and Medium Enterprises (SMEs)”. Further client group are the foresters.

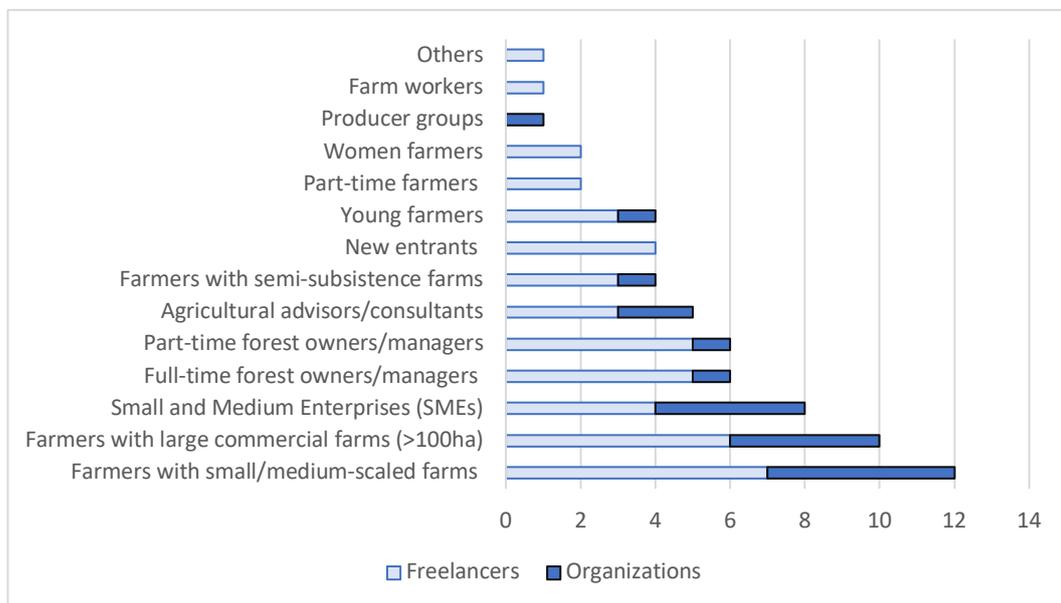


Figure 3: Type and frequency of client groups

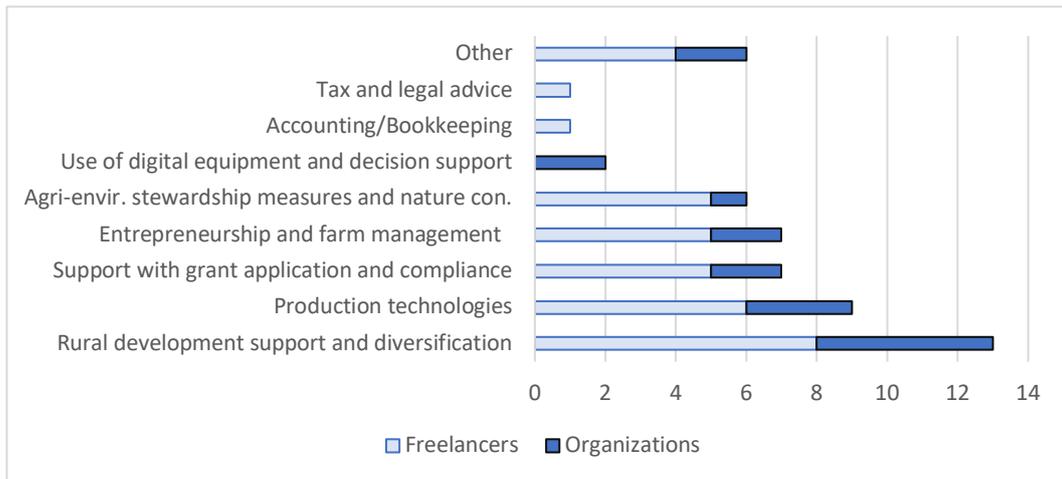


Figure 4: Type and frequency of cross-cutting advisory topics demanded by client

The most frequent are “Rural development support and diversification (farm/forest)”(13), “Production technologies”(9), “Support with grant application and compliance with regulation and standards”(7) and “Entrepreneurship and farm management“(7).

Among other topics the respondents mentioned: Growing technologies of crops, diagnostics of plant nutrition, innovation of crops and technologies of agricultural primary production; Consulting service includes representing the client in legal and technical matters in the fields of energy, environment, health and safety, fire protection, or. others (based on accreditation certificates); Animal nutrition, animal, RV, organic farming; Plant protection (2x); Consulting in the field of occupational safety.

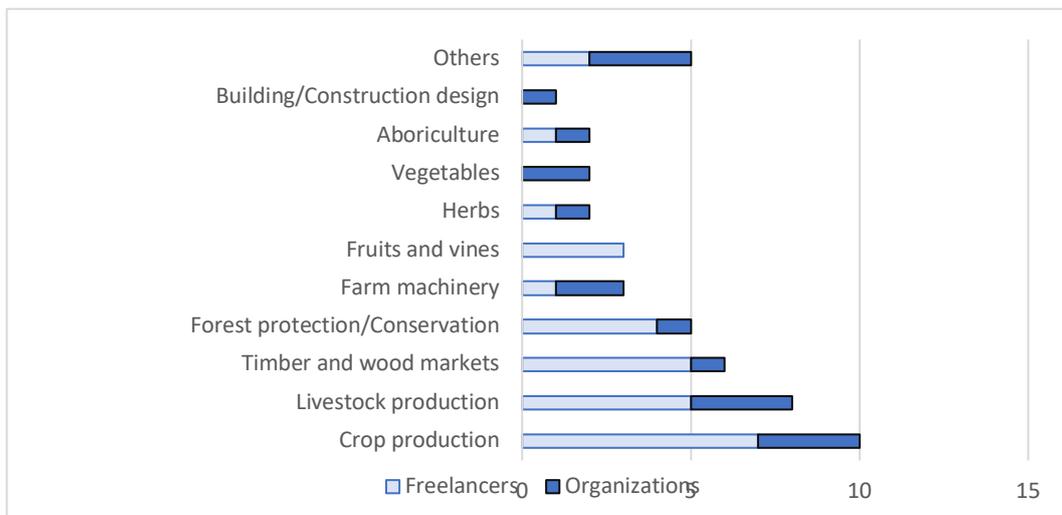


Figure 5: Type and frequency of topics provided by organizations

The most frequent topics are “Crop production”, “Livestock production” and “Timber and wood markets”.

Among other topics the respondents mentioned: Forest cultivation; Integrated forest management; Subsidy conditions, basic valid operating legislation; consulting service includes representing the client in legal and technical matters in the fields of energy, environment, health and safety, fire protection, or. others (based on accreditation certificates); work safety; soil and water conservation.

There are no outsourced topics.



Figure 6: Type and frequency of methods

The most frequent advisory method is „Individual face to face advice on the farm/enterprise“. Further advisory methods are „Individual advice via telephone,“ and „Individual face to face advice outside the farm/enterprise (e.g. advisory office)“.

The proportion between individual and group method are for organization almost equal. For freelancers are the individual methods more frequent. Interesting is that all 3 women from sample are fully for Individual method of advice.

The COVID 19 situation cause that 7 freelancers and 4 organizations change their providing of advice. Particularly, due to the COVID 19, 11 advisory providers had to decrease the personal meetings with farmers and on the farm and increase the use of mail, phone media to communicate with farmers.

## 4.5. Linkages with other AKIS actors/knowledge flows

To evaluate the cooperation among survey respondents and other AKIS actors, we calculated the weighted average by express the importance of each level of cooperation. We assign to each of cooperation level the coefficient (i.e. no cooperation - 0; weak cooperation - 1; medium cooperation - 2; strong cooperation - 3). Finally, we count the weighted average by freelancers, organizations and the total sample.

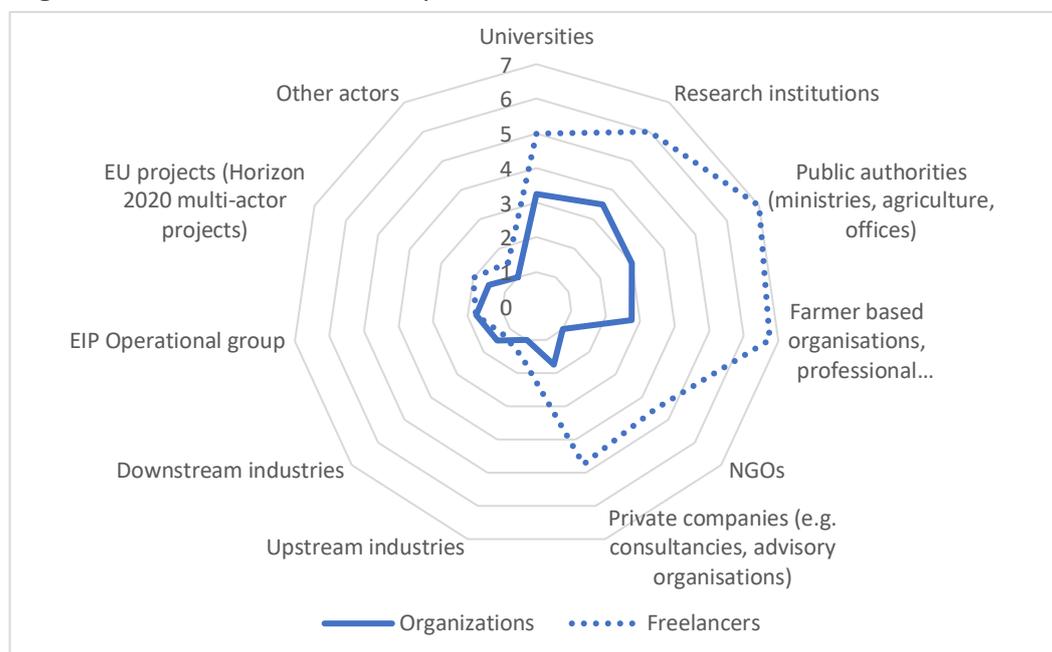


Figure 7: Type and frequency of cooperation among actors

The Figure XY demonstrate that the freelancers are more cooperative than organizations. The reason for that could be the incorporation of many back-office activities in organization structure, therefore lower need for cooperation outside the organization.

## 4.6. Programming and planning of advisory work

In our survey, three organizations have the staff development strategy. Only two organizations specified the strategies. One is a Private/Commercial advisory organization and its strategy is target “areas of energy, safety and health at work,

fire protection, inspection activities and agricultural programs under discussion”. The other is University-based/Research-based advisory organization its strategy is focus to “complex land consolidations, pedology, formation and exploitation of landscape”.

According to the expert opinion, the Czech company do not support the staff development strategy beyond the compulsory ones (such as fire security, work security).

One advisory organization has a trainer/training unit responsible for developing staff capacity. The training of advisors in almost all organizations are ensured by external education and training events. They attend at least 4 days of compulsory trainings to keep the accreditation. One organization has one-month course for their advisors. In average it is 10 days per year per advisors.

One organisation has reward system for their advisors according to the economic results.

#### **4.7. Advisory organizations forming the FAS and evaluation of their FAS implementation**

Accredited advisors are an important part of AKIS. Their professional quality is proved through accreditation. The aim of accreditation is to make a qualification background for the functional agriculture advisory system and guarantee the professional competence of agricultural advisors registered in the public database - the Registry of Advisers MoA. Generally, efforts are aimed toward maintaining the wide reach of FAS, but with rules regarding a basic minimal frame. Advisors in FAS are educated as universal, broadly oriented and professionally qualified to help farmers with their problems.

Accredited advisors are a compulsory part of AKIS. Their professional quality is proved through accreditation. In the previous program period RDP 2007—2013, thanks to the support of the Advisory services, there were about 300 accredited advisors. Due to no implementation of Measure 02 - Advisory services in RDP 2014-2020, the current number in Register of accredited advisors is lower, about 191 accredited advisors. In 2013, there were 260 active accredited advisors.

Accredited advisors are mostly private natural bodies; the percentage of female advisors from the Registry of Advisors was on average 22%. More females work at corporate bodies in administrative positions.

Most of the advisors in the Registry are advisors for Plant production rather than animal production (figure 8). Some advisory bodies are accredited in two or three advisory subareas. Advisors mostly use an individual model of advisory work on farms, but sometimes, in case of similar problems, they use group (two or three) consultation.

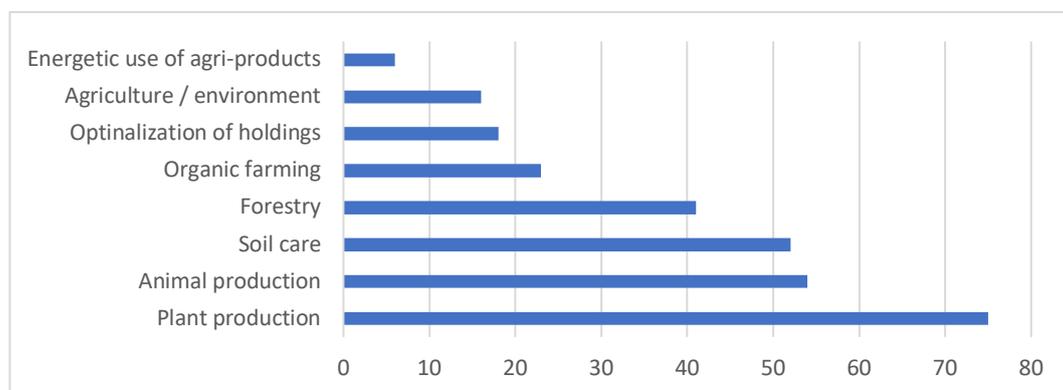


Figure 8: Numbers of accredited advisors from the Registry of Advisors in 2020

## 5. Summary and conclusions

### 5.1. Summary and conclusions on sections 1 – 3

This report updates and expands the PRO-AKIS country report of 2013/2014 in history, policy, funding, advisory methods, main actors of current Czech AKIS.

The modern advisory environment in the Czech Republic has become established after 1990 and were strongly influenced by the entrance to the European Union in 2004. However, actually means to support advisory services are mainly from national subsidies.

In national subsidies, there are supported the whole range of activities: Special advice for crop and animal production, the connection of practice and vocational education, Regional transfer of information, Professional consultations, Demonstration farms, Training in productive fisheries, in beekeeping and the Czech Technology Platform for Food, for Organic Agriculture, Platform of Plant Biotechnologies (Plants for the Future) or for Agriculture.

In RDP, there are supported the group knowledge transfer like seminars, information events and different kinds of cooperation among different type of AKIS actors. Unfortunately, the support by M02 advisory services was not implemented in RDP 2014-2020 and it cause the lower willingness of advisors to be accredited.

Most of the advisors in the Registry are advisors for Plant production rather and animal production. Some advisory bodies are accredited in two or three advisory subareas. Advisors mostly use an individual model of advisory work on farms, but sometimes, in case of similar problems, they use group (two or three) consultation.

The AKIS structure and actors were described from two point of views, according to strategic documents or financial resources.

According to previous research, the most frequent advisory service providers are the input and machineries suppliers (where the advice is included into the price of service), other are the peers, farmer-based organizations, then the active accredited advisors and researchers. The accredited advisors can be freelancers as well as employees of some of the organizations.

## 5.2. Summary and conclusions on sections 4

The summary of section 4 based on the survey among the providers of advice.

Our survey was filled in by 3 organisations with advisory component, 3 advisory organizations and 14 advisors – freelancers (including 3 women). Proportion of women in the Survey is in harmony with the total percentage of female advisers from the Registry of Advisers, approximately one fifth.

All these organizations receive the „Cost-recovery from farmers (fee for service financing)“. Three of them have “National/Regional government funds (public funds)“. One has „Contribution (membership fee)“. One organization receives fund for research project of innovation. Two organizations increase their budget by expand to new regions or activities or by implementation of research/innovation on the farm.

All organizations in the Survey have at least one accredited advisor. Three organizations have the staff development strategy. One advisory organization has a training unit responsible for developing staff capacity. The training of advisors in almost all organisations are ensured by external education and training events. They attend at least 4 days of compulsory trainings to keep the accreditation. In average it is 10 days per year per advisors. Only one organisation has reward system for their advisors according to the economic results. The most frequent area of advice are “Information dissemination (face to face, via digital tools)” and “Targeted consultation services (business plans, credit/subsidy application, etc.)“. This results are supported also by previous researches.

The number of clients vary from 2 to 50 for freelancers and from 50 to 120 clients for organizations. Majority of clients have long-term contracts, so the number of newly concluded contracts varies in units per year.

The most frequent client groups are farmers and SMEs, then foresters. The most demanded topics are Rural development support and diversification for farmers as well as for foresters, then Production technologies in crop production and livestock production or timber and wood markets. There is no outsourced topics. According to expert opinion the Czech organizations like to be independent in their field and they are not used to outsourcing any activities.

The most frequent advisory method is the individual face to face advice on the farm/enterprise, via telephone or individual outside the farm. The proportion between individual and group method are for organization almost equal. For freelancers are the individual methods more frequent.

The COVID 19 situation cause that 11 advisory providers had to decrease the personal meetings with farmers and on the farm and increase the use of mail, phone media to communication with farmers.

From cooperation point of view among the survey respondents and other AKIS actors, the freelancers are more cooperative than organizations. The reason for that could be the incorporation of many back-office activities in organization structure, therefore lower need for cooperation outside the organization.

In our survey, three organizations have the staff development strategy. According to the expert opinion, the Czech companies support only the compulsory activities like fire security, work security.

Only one advisory organization has a training unit responsible for developing staff capacity. The training of advisors in almost all organizations are ensured by external education and training events. In average it is 10 days per year per advisors. Only one organisation has reward system for their advisors according to the economic results.

In our survey, all organizations are receiving the fee for service financing. Three organisation have national/regional government funds and other resources are contribution (membership fee), fund for research project of innovation.

The responses in survey are supporting the fact from previous research that just a small part of advisors is actively searching for the new information and cooperation. Therefore, they are willing to participate in such a survey. They are actively searching information about new project and its outcomes. The rest of advisors are passively waiting for information which will approach them from traditional resources.

## **6. Acknowledgement of partners, information sources and gaps**

Thanks to all experts participating in the working group for Knowledge Transfer, the working group for Transfer of Knowledge and Practices to Implement Agricultural and Forestry Measures to Reduce the Effects of Climate Change and the Effects of Drought, the Regional Multi-actor Group and Andrea Pekárková.

Finally, the H2020 AgriLink project (no 727577), which conducts research to enhancing the role of agricultural advice and associated advisory services in farmer decision-making and the transition towards more sustainable European agriculture.

All these sources helped me to process the most up-to-date information in the field of consulting in the Czech Republic. And ensure the quality and informative value of the processed report, despite the low number of responses to the survey by consultants.

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## Appendices

### Annex 1: Description of subsidies

The annex 1 describe the details of Czech subsidies supported the AKIS (MZe, 2020b).

#### RDP measures

Particular RDP measures are M01 (Knowledge transfer and information events) and M16 (Cooperation). The measure M02 (Advisory services) was prepared, but never running by the Ministry of Agriculture.

##### **M01 Knowledge transfer and information events**

The aim of the measure is to strengthen the knowledge base and support the transfer of knowledge in agriculture, food and forestry. Support for lifelong education and training in the agricultural, food and forestry sectors will lead to its fulfillment.

To this end, activities in the field of vocational training, skills acquisition and information events will be funded. Educational projects in this measure will be able to be implemented only by entities accredited by the Ministry of Agriculture. The participant in the action may be an agricultural entrepreneur, a food producer processing agricultural products, the owner of agricultural and forest land or a person managing forests, or their employee and other persons working for operators who are small or medium-sized enterprises operating in rural areas. In the case of an agricultural entrepreneur - a natural person - a participant may also be a cooperating person who participates in the management of the agricultural entrepreneur.

The Knowledge Transfer and Information Action measure is divided into two operations:

##### **1.1.1 Educational events**

##### **1.2.1 Information events**

##### **M16 - Cooperation**

The common objective of the measure is to strengthen research, technological development and innovation, increase the competitiveness of small and medium-sized enterprises in the agricultural sector and aim to contribute to competitive agriculture, food and forestry and the sustainable development of natural resource management.

### **16.1.1 Support for EIP operational groups and projects**

This is a completely new form of support under the Rural Development Program for the period 2014-2020 (RDP). The support is based on the European Innovation Partnership initiative "Agricultural Productivity and Sustainability" (hereinafter "EIP"). The aim of this initiative is to support the functioning of the operational groups covered by the EIP. At the same time, the operation will provide support for direct expenditure related to the introduction of innovation in business operating in the agricultural and food sectors.

The topics are:

- increasing agricultural productivity, economic viability, sustainability, performance and resource efficiency
- opening new products and market opportunities for primary producers

The results of the project of the operational group are disseminated mainly through the EIP-AGRI network, resp. Nationwide rural networks, only then can the project be reimbursed.

The operating group can use the so-called Innovative Broker. The task of innovative brokers is to facilitate the establishment and, where appropriate, the subsequent functioning of operational groups. The facilitator plays a key role in identifying an appropriate incentive that would lead to the development of a specific innovative project.

### **16.2.1 Support for the development of new products, processes and technologies in primary agricultural production**

The operation is focused on the development of innovations in agricultural primary production. These are projects that introduce new or significantly improved products, processes or technologies with regard to their properties or intended use. Therefore, technologies, products or processes must be at least new (or substantially improved) for the company. This includes significant improvements in technical features, components and materials, software, user friendliness or other functional features. The new technology, product or process must be developed in collaboration with a research entity or applicant that has demonstrably sufficient resources in the form of qualified staff and production resources to develop the new product, process or technology. In the case of company-only innovations, the cooperating entity (the applicant's research / development team) must play a significant role in applying (adapting) the already existing technology, product or process to the specific conditions of the company. The innovativeness of the project will be assessed by an expert commission before

the project is approved. The aid is provided as a total amount covering the operating costs of the cooperation as well as the direct investment costs associated with the introduction of the innovation in the applicant's company.

#### **16.2.2 Support for the development of new products, processes and technologies in the processing and marketing of agricultural products (Food Innovation)**

The operation is focused on the development of innovations in the processing of agricultural products and their marketing. These are projects that introduce new or significantly improved products, processes or technologies with regard to their properties or intended use. Therefore, technologies, products or processes must be at least new (or substantially improved) for the company. This includes significant improvements in technical features, components and materials, software, user friendliness or other functional features. The new technology, product or process must be developed in collaboration with a research entity or applicant that has demonstrably sufficient resources in the form of qualified staff and production resources to develop the new product, process or technology.

#### **16.3.1 Sharing devices and resources**

Support for cooperation between at least two entities in the joint sharing of equipment and resources. The intention is to help small operators in rural areas to work together to find economies of scale that they do not achieve if they operate independently. Joint investments will be supported, i.e. machines for the performance of their activities or the modernization or construction of storage and production premises or the execution of construction works necessary to enable the efficient use of resources.

#### **16.4.1 Horizontal and vertical cooperation between actors in short supply chains and local markets**

Support for cooperation between at least two entities, leading to the creation and development of short supply chains (LDCs) and local markets.

#### **16.6.1 Horizontal and vertical cooperation in the sustainable provision of biomass for energy production, food production and industrial processes**

Support for cooperation between at least two entities to set up sustainable provision and use of local biomass resources in energy, food and industrial processes.

## The national subsidies

The national subsidies offers the whole range of measures. The rules of national subsidies are described in Principles Setting the Conditions for the Provision of Subsidies for the Year 2020 (MZe, 2020b).

Particularly:

### **9.A Special advice**

- **9.A.a. Special advice for animal production in relation to Act No. 154/2000 Coll. It is support for organization of seminars and training.**

- **9.A.a.2. Support for educational activities in animal production. Including Publication of results of breeding work (9.A.a.2.a.), Arranging exhibitions and shows of livestock (9.A.a.2.b.)**

- **9.A.b Special consultancy for crop production. Including Publication of recommended varieties and related information (9.A.b.1.), Support for the organization of exhibitions of cultivated plants (9.A.b.2.), Support for the organization of seminars and training for the growing public (9.A.b.3.), Support for the provision of separate varietal tests of registered field crop varieties, in order to ensure the acquisition and dissemination of information on the characteristics of registered field crop varieties, which are subsequently published to the agricultural public (9.A.b.4 .)**

All these supports are in order to raise awareness of the general public about agricultural products of plant production.

### **9.E. School competitions**

Support for the connection of practice and vocational education in the form of cooperation of business entities that have received the status of School Plant, with secondary schools and vocational colleges providing training for future employees of the ministry, creation of conditions for practical teaching of pupils of secondary schools and higher vocational schools of determined departmental disciplines at workplaces of business entities appointed by the School Plant.

### **9.F. Support for agricultural advice**

#### **9.F.e. Regional transfer of information**

Purpose of the grant Consultative and methodological assistance to agricultural holdings in the form of dissemination of information on the measures of the Rural Development Program and on current problems in the implementation of the common agricultural policy; transfer of research and development results into practice. Support is provided according to Article 21. Commission Regulation (EU) No 702/2014 Subject of the subsidy Support in the field of agriculture aimed at targeted transmission of general information in the Czech Republic Implementation of the common agricultural policy in accordance with regional

priorities, initial consultations (telephone, e-mail, personal), websites, professional / teaching materials, seminars, workshops and courses.

**9.F.i. Professional consultations**

Purpose of the subsidy Consultative and methodological assistance to agricultural enterprises in the form of dissemination of information on the measures of the Rural Development Program and on current problems in the implementation of the common agricultural policy 22 and / or Article 39 of Commission Regulation (EU) No.702 / 2014.2 Subject of the subsidy Support of agricultural and forestry advice focused on professional consultations in the form of telephone, electronic, written contact at the workplace of a consultant for a limited time an individual professionally focused inquiry of an operational nature

**9.F.m. Demonstration farms**

Purpose of the grant is to support consulting and methodological assistance to agricultural holdings through the sharing of experience, transfer of information on the latest knowledge and technologies and their use in precision agriculture, dissemination of information on Rural Development Program measures and current problems in implementing the common agricultural policy.

Support for agricultural knowledge transfer to help farmers through practical demonstrations of comprehensive sustainable farming practices, such as practices and technologies to reduce water and wind erosion, soil compaction, practices that contribute to water retention in the country or present climate change adaptation and mitigation measures , integrated plant protection organic farming.

**9.H. Support for participation in international fairs and exhibitions abroad**

**9.H.a Support for participation in international fairs and exhibitions abroad under the auspices of the Ministry of Agriculture**

Purpose of the grant Support of participation of exhibitors, their products or services at selected international fairs and exhibitions abroad travel costs and payment of registration fee to entities participating in foreign fairs and exhibitions (agricultural, food, forestry and horticulture), where the Ministry of Agriculture has an official exhibition in the period from 1.6.2019 to 31.5.2020. List of international fairs and exhibitions for which an application can be submitted on the subsidy, is listed under point 9 List of international fairs and exhibitions, where the Ministry of Agriculture has an official exhibition

**9.I. Support for the improvement of practical training in productive fisheries.**

Purpose of the subsidy Increase in functionality, technical equipment and operation of water works in order to improve the conditions for providing training in the fisheries industry.2 distribution facilities, handling bridges, broths and dam fortifications.

9.I.c Purchase of vehicles, machines, tools and technological lines intended for the service of water works.

**9.J. Improving practical training in beekeeping**

Support of practical training in beekeeping combined with the presentation of various beekeeping technologies in the conditions of large-scale and small-scale farming. 2Subject subject Rate per beehive, one location (apiary), one additional beekeeping operation. Education will be provided in the form of the study field Beekeeper (41-51-H / 02). The funds must be used for costs associated with training hives, habitats (apiaries) and ancillary beekeeping operations (e.g. acquisition and processing of bee products, analyzes of bee product quality, diagnosis of bee diseases, production and maintenance of beekeeping supplies and equipment) and will not be used for farming activities.

**10.D. Support for European integration of non-governmental organizations**

Aim of support is to Improve the effectiveness and professional level of NGO activities by supporting integration within the EU. Supporting entry, membership, membership representation and activities of Czech State Agricultural Agrarian Non-Governmental Organization with significant national competence of the agricultural-food complex, which is a full or associate member in the selected international organizations.

**10.E. Support of technological platforms within the competence of the MoA**

**10.E.a. Support of the Czech Technology Platform for Food**

The purpose is ensuring information and promotion activities used to promote the objectives, activities and results of the platform's work and involvement in national and European structures, in particular the European Technology Platform Food for Life.

**10.E.c. Support of the Czech Technological Platform for Organic Agriculture**

Support of the technological platform activities aimed at strengthening functionality, building internal structure, staffing and involvement in national European structures and fulfilling professionally relevant objectives of the Czech Action Plan for Organic Agriculture Development in 2016-2020. Information and promotion activities used to promote the objectives, activities and results of the platform's work, including ensuring the transfer of information between science, research, agricultural and business practice in the field of organic farming and production.

**10.E.d. Support of the Czech Technological Platform of Plant Biotechnologies (Plants for the Future)**

Purpose is to support of the technological platform activities aimed at strengthening functionality, building internal structure, staffing and involvement in national and European structures, and fulfilling professionally relevant goals of the Strategic Research Agenda. Information and promotion activities used to promote the goals, activities and results of the platform's work, including ensuring the transfer of information between science, research and agricultural and business practice in the field of biotechnology. Professional activity will take place on the basis of the Strategic Research Agenda.

**10.E.e. Support of the Czech Technology Platform for Agriculture**

Support of the technology platform, stated in the Implementation Action Plan (IAP), aimed at disseminating the latest scientific and research findings, sharing and using professional information and strengthening communication between business and academia through public-private partnership principles, fulfillment needs of agricultural entrepreneurs in the Czech Republic and the related processing industry. Promoting a long-term sustainability strategy, taking into account the development of the European agricultural sector. Connection with the European Technology Platform, in the field of applied research and agricultural practice and strengthening the positive impact of agriculture, including benefits for consumers.

# AKIS and advisory services in *Estonia*

## Report for the AKIS inventory (Task 1.2) of the i2connect project

***Date: January 2021***

**Authors:**

Hanna Tamsalu  
Agricultural Research Centre  
National rural network support unit  
Contact: hanna.tamsalu@pmk.agri.ee

Project funded under the Horizon 2020 Research and Innovation Programme  
under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION' HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

The aim of the report is to provide a description of the Agricultural Knowledge and Information System (AKIS) in Estonia. This report represents an output of the i2connect project. It is one of 30 country reports compiling an inventory of AKIS. AKIS describes the exchange of knowledge and supporting services between many diverse actors.

The report will give an overview of the AKIS infrastructures and on the predominant agricultural advisory services on national level. The term 'agriculture' is used in its comprehensive form to also include forestry, fisheries and horticulture. The intention is that through these reports, essential features of the institutional and infrastructural environment in which advisors in the green sector operate, will be revealed (Knierim et al. 2020:32-34).

Agricultural land is generally extensively used in Estonia. Agriculture is characterised by high degree of concentration of production in relatively small number of commercial farms. Estonia is one of the most forested countries in the world: forests cover nearly half of the mainland.

Large scale of different components of AKIS are available, the opinion of weak AKIS is not correct. They advisors provide services and information to farmers, foresters and other interested parties. The advisory services in Estonia could be described as a mixed system of supported and private advice providers. Research and education actors include the universities, several research institutes and vocational schools. There are several farmers' representation organisations and farmer based organisations and cooperatives in Estonia providing information and advice to their members. The input sellers and private media companies are important part of knowledge transfer.

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## Abbreviations

AKIS	Agricultural knowledge and information system
ARIB	Agricultural Registers and Information Board, Paying Agency
CAP	European Union Common Agricultural Policy
EIP	European innovation partnership
EMFF	European Maritime and Fisheries Fund
EU	European Union
FAS	Farm Advisory System
LAGs	LEADER local action groups (for fisheries, FLAG)
MRA	Ministry of Rural Affairs (former Ministry of Agriculture)
NSU	National rural network support unit, which is operated by one department of Agricultural Research Centre
RDF	Estonian Rural Development Foundation
RDP	Estonian Rural Development Plan

## 1. Main structural characteristics of the agricultural and forestry sector

Estonia is the northernmost and smallest of the Baltic countries, territory of 45 227 km<sup>2</sup>. The population — 1.33 million in 2020 — is relatively urban and has been decreasing since the country regained its independence in 1991. The Estonian economy has experienced significant growth and structural changes during the last 25 years. Gross Domestic Product per capita has grown faster than the OECD average since 2000, but it remains 30% lower than the EU average<sup>1</sup>.

The main challenges for the provision of infrastructure and services in Estonia are the high concentration of the population in main urban centres (over 60% is urbanised and 40% is concentrated around the capital city), and its low density in most rural areas – average population density is 30,5 people/km<sup>2</sup>. There are problems with the availability and quality of infrastructure in rural areas.

**Agriculture** is one of the most traditional industries in the Estonian economy. It plays an important role, supplying food to residents and foreign countries and providing employment. Agriculture provides about 1-2% of the value added created in Estonia, and 2% of the employed work in this field. The food industry also employs about 2% of the employed and provides 2% of value added.

By the end of 2019, 1.05 million ha of **arable land** (Figure 1), 0.24 million ha of natural grassland and 2.29 million ha of forestland were registered<sup>2</sup>. The utilized agricultural area holds 990 528 ha and organic crop area 220 737 ha. In the period of 2003-2016 the number of farms in Estonia decreased by almost 55%, from 36 860 to 16 700.<sup>3</sup> According to the number of applications for single area payment, the number of agricultural holdings is decreasing: 17 425 applications in 2015 and 14 077 in 2020<sup>4</sup> In the last five years, the area of arable land and forest land has increased, while the area of natural grassland is decreasing.<sup>5</sup>

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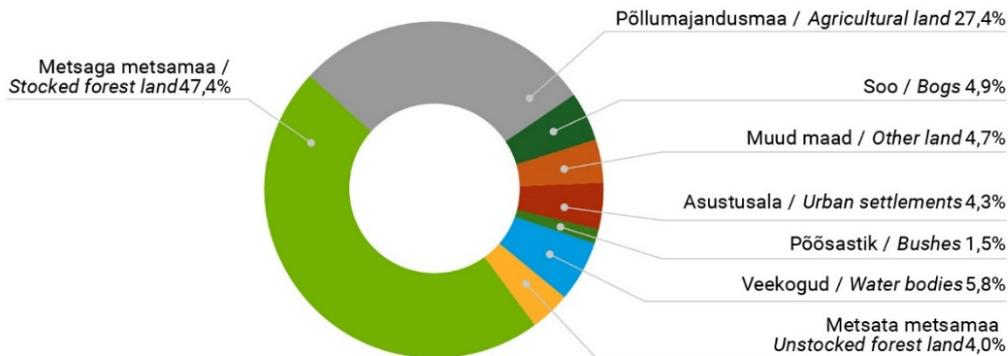
<sup>1</sup> Ministry of Rural Affairs (2020, overview). Estonian Statistics, Agriculture [15.10.2020] <https://www.stat.ee/et/avasta-statistikat/valdkonnad/pollumajandus-kalandus-ja-jahindus/pollumajandus>

<sup>2</sup> Source: Estonian Environment Agency, 2018), Statistics Estonia (2020)

<sup>3</sup> The EUROSTAT farm structure survey is carried out every 10 years and as a sample survey every 3-4 years.

<sup>4</sup> [www.pria.ee](http://www.pria.ee)

<sup>5</sup> Development Plan "Estonian Agriculture and Food 2030" <https://epkk.ee/ept2030/>



**Figure 1.** Total area of Estonia by land categories (Source: Estonian Environment Agency, 2018)

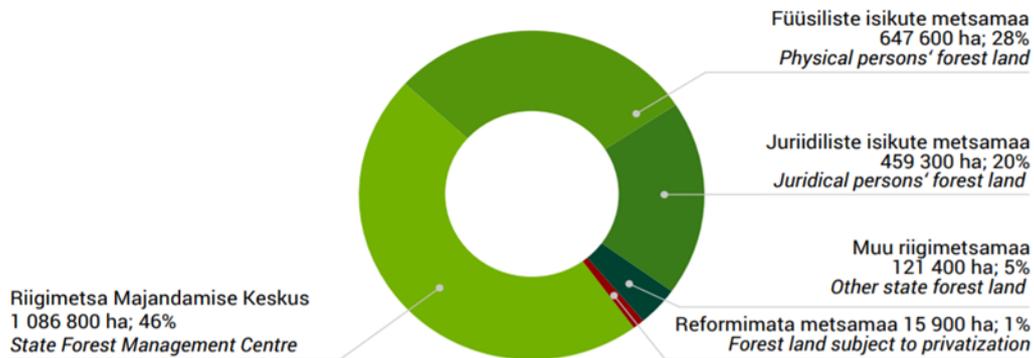
At the end of 2019 the number of cattle was 254 000, including 85 000 dairy cows. According to Statistics Estonia 821 500 tonnes of milk was produced (an increase of 3% compared to the previous year) and the average milk production per cow was 9 633 kg/year (3,7% increase). The number of pigs was 306 300 (5% increase) and the number of sheep and goats 74 400 (5% decrease). Average yield of cereals differs a lot depending on the year and was 2,6 t/ha in 2018 and 4,5 t/ha in 2019<sup>6</sup>.

Estonia is one of the most forested countries in the world: forests cover nearly half of the mainland. The forests here stand out with an abundance of species, preserved thanks to a large proportion of naturally renewed forests and few alien tree species. The area and reserves of **forests** have increased significantly over the last half century; almost half of Estonia is covered with stands. The area of Estonian forestland is 2,330,796 ha, of which about 74% are managed forests (Figure 2). The growing forest reserve is 480,260,000 m<sup>3</sup>. The most common tree species are pine, birch and spruce.

A quarter or 24.6% of forestland has a stricter or more lenient protection regime. State owns 1.21 million ha or 51.8% of the total forest land area and private forests cover 1.11 million ha or 47.5%. There were 104,311 private forest owners in Estonia at the end of 2019, of which 94.3% were natural persons and 5.7% legal persons. The average size of private forest ownership in Estonia was 10.7 ha, in the case of natural persons this indicator was 6.6 ha and in the case of legal

<sup>6</sup> Statistics Estonia, [www.stat.ee](http://www.stat.ee)

persons 78.6 ha.<sup>7</sup> The value added of forest sector accounted for 1.0% of Estonian total value added (212.8 million euros) in 2018.



**Figure 2.** Distribution of forest land area by ownership categories (Source: Estonian Environment Agency, 2018)

The direct and related indirect and induced value added of the forest sector (forestry, wood industry, furniture production, paper and pulp production) in 2017 totaled 2.5 billion euros, ie 10.7% of the country's GDP and 12.4% of value added. According to Statistics Estonia's Labor Force Survey, the share of the employed in the forestry sector has remained stable at five to six per cent of the total number of employed in the last decade. Only the number of timber workers is taken into account and jobs related to nature tourism and non-timber values are not included. Forestry sector<sup>92</sup> employs 35 800 persons (20% in forestry, 49% in wood industry, 26% in furniture industry and 5% in paper industry). Forestry income comes primarily from the sale of timber. It is estimated that wood accounts for more than 95% of forestry income.<sup>8</sup>

Estonia has good preconditions for the production of **fishery and aquaculture** products. A total 86,924 tonnes of fish were caught in 2019 (incl long-distance fishing, trawling in the Baltic Sea, coastal fishing and inland fishing), which is 1.4% less than in the previous year. Estonian aquaculture consists of three areas of activity: fish farming, crayfish farming and fish farming for restocking in natural waters. A fourth area of activity is being added - algae and shellfish farming.

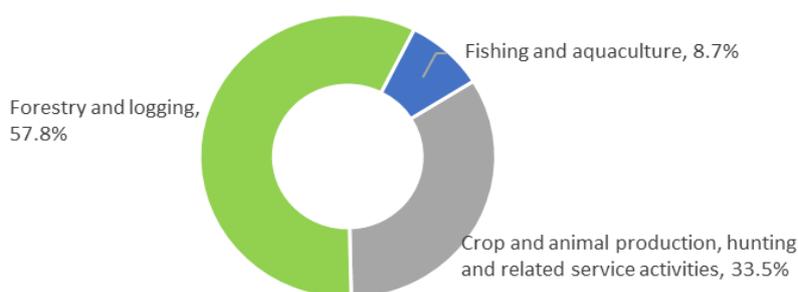
<sup>7</sup> Keskkonnaagentuur Yearbook Forest 2018 <https://www.keskkonnaagentuur.ee/et/aastaraamat-mets-2018>

<sup>8</sup> Ministry of Environment <https://www.envir.ee/>

Almost 20% or about 14,000 tons of Estonia's commercial fishing catch is caught in coastal and inland fishing, where almost 1,400 permit holders operate in the form of about 2,500 fishermen entered in the permit. In 2018, approximately 170,000 recreational fishers were engaged in recreational fishing as one of the ways of spending free time.

Companies operating in the fisheries sector have a long tradition, know-how and experience, and have begun to develop and introduce new processing equipment with state-of-the-art technological solutions and environmentally friendly farming technologies. Over time, joint activities have become more active, a clearer example of which is the fisheries producer organizations, of which there are five in Estonia, and to which a central cooperative uniting producer organizations is added.<sup>9</sup>

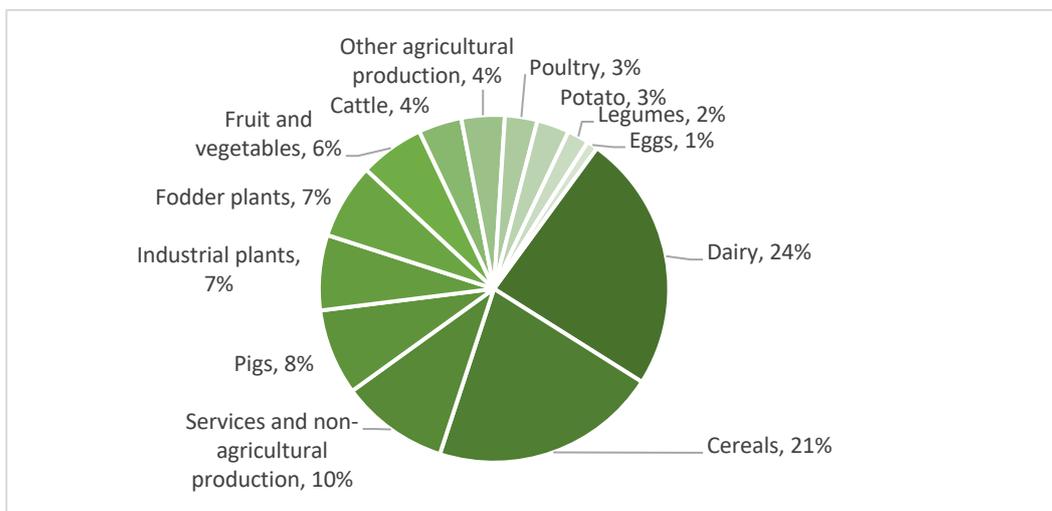
More than 700 companies are engaged in **food production** in Estonia (2,9% of the added value created by enterprises in Estonia). Compared to the average of manufacturing activities, 2019 was more economically successful for the food industry. In 2019, food industry companies produced ~ 1.7 billion € of products, of which a third was exported. **Small food producers** have made a relatively strong leap forward, offering both traditional and new and innovative products, mainly handcrafted. It enriches the food table of the Estonian consumer, provides work for the local community, helps to preserve life in rural areas and keeps national recipes and cooking methods alive.



**Figure 3.** Gross value added in 2016 (Source: Estonian Statistics, 2020)

<sup>9</sup> Ministry of Rural Affairs, 2019 <https://www.agri.ee/et/eesmargid-tegevused/arengukavad-ja-strateegiad>

In 2019, € 830 million in **value added** was created in enterprises engaged in agriculture, fisheries and the food industry (Figure 3), which was almost a fifth more than in the previous year. These activities accounted for 3.4% of the value added created in Estonia. The largest contribution to growth was made by plant production and animal husbandry, where value added increased by 37% compared to the previous year. Companies in the agricultural, fisheries and food industries are important employers. In 2019, an average of 29,100 people were employed in these activities, accounting for 4.3% of total employment.

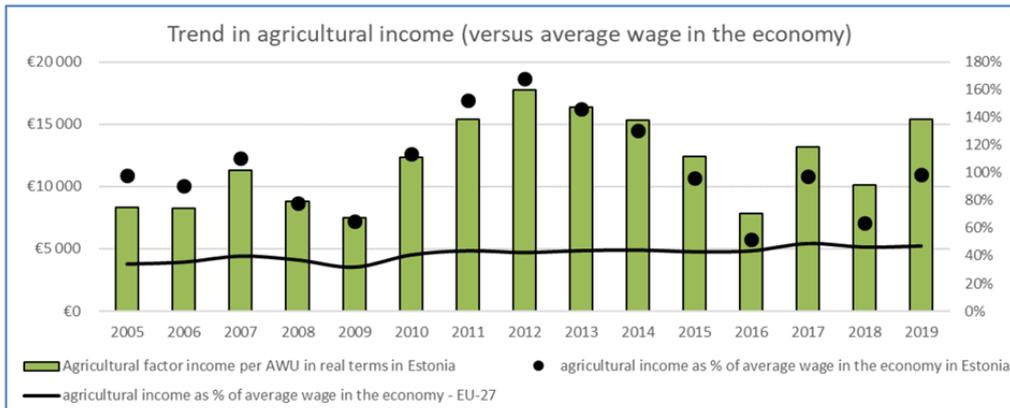


**Figure 4.** Structure of the total output value of agriculture in 2019 (Source: Ministry of Rural Affairs, 2020)

The **value of the total output of the agricultural production** at basic prices (including product subsidies) in 2020 was 981 million euros, which is 2% less than last year's figure. The value of crop production makes up almost 48%, the value of livestock production 42% and the value of services and inseparable ancillary activities 10%<sup>10</sup>. The agricultural, forestry and fisheries sector accounted for 3.3% of the gross value added (GVA) of Estonia in 2019 (for comparison, the EU average was 1.8%). Crops formed almost 51% of agricultural output, and 21% of crops were cereals. Animal output reached slightly over 43% with milk production as the main contributor (25% of total animal output)<sup>11</sup>.

<sup>10</sup> Ministry of Rural Affairs, press release of 4.12.2020

<sup>11</sup> European Commission. *Statistical Factsheet Estonia*, June 2020



Source: Directorate General for Agriculture and Rural Development. *CAP context indicators C.25 Agricultural factor income and CAP context indicator C.26 Agricultural entrepreneurial income*. Income based on EUROSTAT [[aact\\_eaa04](#)], [[aact\\_ali01](#)] and [[aact\\_eaa06](#)], adding back the compensation of employees to the entrepreneurial income and divided by the total number of annual working units. Note: 2019 data estimated. The Average wage in the economy based on EUROSTAT [[nama\\_10\\_a10\\_e](#)] thousand hours worked using employees domestic concept and [[nama\\_10\\_a10](#)], item wages and salaries.

**Figure 5.** Trend in agricultural income (Source: European Commission, 2020)

The agricultural sector in Estonia is characterised by a decreasing number of farms and increasing farmland area. Agriculture plays a more important role in the overall economy of Estonia than it does in most other EU Member States, and seems to be more attractive to young farm managers than observed on the average in the EU Member States. Rural areas are predominant in Estonia, with 82% of the territory and 44.5% of population share. Rural areas face depopulation, poverty and ageing. The low level of economic activity, the limited quality job opportunities and missing basic infrastructures and services make rural areas less attractive.<sup>12</sup>

<sup>12</sup> European Commission, 2020

## 2. Characteristics of AKIS

Estonian AKIS benefits from the small size of the country. Key persons in different institutions forming AKIS know each other well and cooperate in different forms and topics. Several RDP measures have been designed (and successfully implemented) to support the cooperation between the actors. Training and farm advisory services are provided in Estonia by publicly supported advisors and a number of independent organisations.

Regarding studies or reports<sup>13</sup>, the Estonian AKIS appears weak and fragmented, as no central hub exists for overall coordination of innovation and knowledge exchange in agricultural sector and rural activities that relate to it. The linkages and cooperation (in the opinion of different stakeholders or studies) need enhanced collaboration, but the conclusion of weak AKIS is not correct.

### 2.1. AKIS description

Estonia has well established public **agricultural** research, education and extension (advisory) organisations. The agricultural advisory system (led by Rural Development Foundation) connects individual advisors to the organization providing advising services. The leading unit for disseminating knowledge in the field of **forestry** is the Private Forest Centre and in the field of **fisheries and aquaculture** - The Fisheries Information Centre.

The trainings and other knowledge transfer actions are organised by various private organisations as well by research and innovation institutes. There are universities and several institutes that conduct research in agriculture, forestry, fisheries and aquaculture. There are umbrella-organisations and university that combines many aspects of rural life.

The collaboration initiatives for the programming period of 2013-2020, like innovation clusters and knowledge transfer programs, are not common in other parts of Europe.

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<sup>13</sup> ProAKIS (2014), European Commission recommendations for Estonia's CAP Strategic Plan (2020),

## Public authorities

**The Ministry of Rural Affairs**<sup>14</sup> (MRA) is the main governing institution for the agriculture, commercial fishing, aquaculture and rural affairs. It is responsible for the coordination of the AKIS, as well as the legal aspects and design of the supporting measures. Among other tasks, it also prepares the national programmes of agricultural applied research.

**The Agricultural Registers and Information Board**<sup>15</sup> (ARIB) is a governmental agency fulfilling the functions of the Estonian Paying Agency and is responsible for the administration of all related CAP (Common Agricultural Policy) or EMFF (European Maritime and Fisheries Fund) measures. It maintains the register of agricultural supports and agricultural parcels as well as the register of farm animals.

Regarding the AKIS, three other ministries play a significant role as well. **Estonian Ministry of the Environment** is responsible of information dissemination regarding environment protection (incl protection of NATURA areas), forestry (incl hunting) and fisheries (resources in water). **Ministry of Education and Research** develops Estonia's education, research, language policy and youth. All the universities and schools are under supervision of Ministry of Education and Research. The main strategic objectives of the **Ministry of Economic Affairs and Communications** regarding AKIS involve governance that encourages entrepreneurship and innovation.

There are several public authorities, which help farmers and food processors to understand the legislations (for example Veterinary and Food Board in the field of starting small-scale processing and Environmental Board regarding the maintenance of protected areas). These authorities also organise trainings and campaigns for adults and children both. Environmental Investment Centre is one of the main financiers of environmental projects in Estonia.

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<sup>14</sup> [www.agri.ee](http://www.agri.ee)

<sup>15</sup> [www.pria.ee](http://www.pria.ee)

## Research and education organisations

Estonia has a strong public research system, but weak innovation in firms<sup>16</sup>. The strengths of the Estonian innovation system are the conducive business environment, high public research expenditure and good skills base in the population. Research necessary for Estonian agriculture, food industry, fisheries and rural life is carried out in several universities, institutes, technology development centers and competence centers, but major part of innovation is driven by input suppliers. The Estonian companies are relatively small and the most innovative companies in Estonia are the subsidiaries of foreign companies and foreign-owned companies. In particular, industry-science linkages are not strongly developed, although programmes have been implemented to facilitate public-private cooperation and to better connect education and skills to labour-market needs.

The **Estonian University of Life Sciences**<sup>17</sup> is responsible for delivering synergy between five major fields of education and research: agriculture and agricultural economics, forestry, environmental sciences and applied biology; veterinary medicine and animal husbandry, and technology and engineering. University provides scientific support and organises many trainings, to entrepreneurs and advisors.

**University of Tartu** is related to AKIS mainly through education and research in the fields of environmental sciences and biology. **Tallinn University of Technology** is an important actor in education and research in the fields of food sciences and biotechnology.

The **Estonian Crop Research Institute**<sup>18</sup> is a state research and development institute. Studies are carried out in the following areas: development and upgrade of efficient and environmentally friendly agro-technologies, plant protection, plant health, agro-chemistry, fertilisation, and agro-meteorology. The institute is dealing with breeding new varieties of agricultural crops and preserving plant

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<sup>16</sup> OECD (2018)

<sup>17</sup> <https://www.emu.ee/>

<sup>18</sup> <https://etki.ee/index.php/eng/>

genetic resources. They are working in close collaboration with farmers and industry and provide scientific expertise for the advisory system and state officials.

The **Center of Food and Fermentation Technologies (TFTAK)** is one of 4 fully operational Digital Innovation Hub in Estonia and conducts research and advances technology-based entrepreneurship also in agriculture and agri-food sectors.

**The Agricultural Research Centre<sup>19</sup> (ARC)** is an institution administered by the MRA. The centre has different laboratories, field testing centres and departments dealing with agri-environmental monitoring, analysis of the rural economy (incl. FADN), and rural networking (see below).

**Innovation clusters and EIP operational groups** are the entities, implemented as the result of RDP measure cooperation (M16). Innovation cluster is a new initiative aiming to encourage broad cooperation between producers, processors, researchers and advisors. Support is paid based on 4-year action plans designed by NGO-s consisting of producers/processors with research/development organisations and some traders as partners, linking to execute common innovative actions. The measure is designed based on EIP principles but the concept of clusters is wider, corresponds to the specific needs of the whole sector. It encourages both national as well as international cooperation; several foreign partners are also involved in different clusters' activities<sup>20</sup>. The results are publicly available. It is expected that concept enables wider implementation of innovative solutions and active long-term cooperation of producers/processors and researchers. The maximum support for one action plan (project) of innovation cluster consisting of several activities is 800 000 euros, and all the action plans implemented have the maximum or close to the maximum budget. Within the cooperation measure, there are also smaller projects, usually implemented by 1-2 businesses and a research partner where the maximum support for one project is 350 000 euros (in second application round 50 000 euros).

There are good opportunities to acquire **education** in agriculture, forestry, food and fisheries at the level of both vocational and higher education. Museums and their educational programs are closely linked to national curricula and contribute

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<sup>19</sup> <https://pmk.agri.ee/en>

<sup>20</sup> Agricultural Research Centre (2019) Mid-term review of Estonian RDP

to raising public awareness. In addition to the Estonian University of Life Sciences, University of Tartu, and Tallinn University of Technology, the professions related to agriculture, handling of food and rural life is possible to study in 10 **vocational schools** (5 regarding agriculture). All schools have Boards, to keep in touch with farmers, processors, farmer based organisations.

### Providers of Advisory Services and AKIS mediators

Professional advisors as well as other advisors, experts and mentors provide counseling services for farmers and enterprises. The state primarily supports the individual advisory service aimed at public interests.

The **Rural Development Foundation** (RDF) is a state founded (in 1993) organisation, which operates in private law. The foundation issues guarantees to banks for credits granted to farmers and other entrepreneurs in Estonian rural areas, and is responsible for RDP financial instruments. The Advisory Centre of Rural Development Foundation is in charge of the publicly funded advisory system. This organisation is the only eligible organisation to offer Measure 2.1 supported advice (since 2015). The Advisory Service of the Rural Development Foundation is the holder of a ISO 9001:2015 standard quality management system certificate and is a member of the European Forum of Agricultural and Rural Advisory Services (EUFRAS). It is also responsible for running the main agricultural and rural information portal [www.pikk.ee](http://www.pikk.ee), where one can find a training calendar, information materials, contacts of advisors, etc.

A number of **other organisations** provide also training and advisory services. The total number of nationally accredited advisors available in Estonia is 109 (on average one advisor per 153 agricultural holdings<sup>21</sup>) with varying specialisation and level of skills; 62 of them are contracted by the RDF. A study carried out in 2018<sup>22</sup> pointed out that while the farmers are mostly satisfied with the organisation of advisory services, the information exchange between the independent advisors and advisors operating at RDF could be improved.

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<sup>21</sup> In 2016 there were 16 700 agricultural holdings.

<sup>22</sup> University of Tallinn. 2018

The **county development centres** (in Estonian *maakondlikud arenduskeskused*), established in 2003, are development organisations located in each county (15), which offer free counselling for start-ups and operating companies, non-profit associations, foundations and for local authorities. These centres offer services to local entities in rural areas, which fall outside of agriculture, forestry and fisheries.

The tasks of the Estonian National **Rural Network support unit (NSU)**<sup>23</sup> is executed by the department in Agricultural Research Centre (ARC). It aims to facilitate flexible, open-minded and gradual development, with bottom-up initiatives based on needs of rural actors. The Rural Network activities involve the collection, aggregation and dissemination of best practices and innovative approaches; organising various events related to rural development. The NSU is actively involved in innovation transfer, as non-formal Innovation Network. NSU actively promotes the exchange experiences at local, national and EU level and organises seminars<sup>24</sup> for advisors and innovation brokers.

### Third sector organisations

Several **producers/processors organisations** are very active in coordinating or participating in knowledge exchange and innovation activities. There are different associations, unions and societies that unite the farmers and producers working within the same field of agriculture (dairy, crops etc.) or food processing (association of bakers, etc); Estonian Village Movement Kodukant, Estonian Association of SMEs etc. Different kinds of co-operation are also promoted through ERDP, e.g. LEADER and producers' cooperatives in general.

Estonian **LEADER Union** is a non-governmental organisation set up to contribute to the implementation of LEADER/CLLD principles in Estonia. The purpose of the union include the support the knowledge-based development of its member organisations. There are **26 LEADER local action groups (LAG)** in Estonia. Estonian LEADER uses only RDP funding, Fisheries LAGs (8 groups) are operating separately. 99.99% of Estonian rural area is covered by LEADER local action groups (LAGs), every LAG has 60 members on the average.

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<sup>23</sup> [www.maainfo.ee](http://www.maainfo.ee)

<sup>24</sup> <https://maainfo.ee/index.php?page=3710>

The **Estonian Chamber of Agriculture and Commerce** (since 1996) has united agricultural producers and their unions (incl horticulture), processors of agricultural products and their unions, forestry organisations and companies providing services to the agricultural sector. It helps in finding business partners, the exchange of market and price information, organising forums and information days, and arranging participation in trade fairs in Estonia and abroad. It is representing Estonia in COPA/COGECA.

The **Estonian Farmers Federation** was established in 1989 and they were the first one to organize an independent advisory service (already in 1991). It unites the county-based farmers unions and several other organisations related to agriculture and rural life.

Several **regional farmers and producers unions** are active in organising different knowledge transfer activities (mostly in their own counties but also across the whole country) and some of them also offer both private (not related to RDF) or supported (in cooperation with Rural Development Foundation) advisory services.

The **Estonian Food Industry Association** was founded in 1993. It represents and promotes the interests of Estonian food and drinks industries and is actively involved in knowledge transfer activities.

Several **organic farming organisations** (e.g. Estonian Organic Farming Foundation, Organic Farming Centre of Estonian University of Life Sciences, Estonian Organic Farming Platform) are also actively involved in different knowledge exchange, applied research and innovation related activities.

The **Estonian Horticultural Association** is the organisation uniting enterprises working in this field. It has been active in several knowledge and innovation activities and is partner or coordinator in different RDP projects.

### Private sector

There are also some other organisations and unions offering advice and training, like companies involved in **selling agricultural inputs** and/or buying production (Scandagra, DeLaval etc). These are quite active in organising field and information days and training for farmers as well as providing advice. They usually have enough

financial resources to employ good specialists, but their advice and training is oriented towards selling their own products and therefore considered not independent.

**Producers' cooperatives** are also important in providing knowledge and advice (mostly) to their members. There are about 100 agricultural co-operatives in Estonia (*Põllumeesteühistu KEVILI, Talukartul*, etc). The legal form of cooperatives can be “for profit” or NGO, their activities and attitudes still depend on their mission. Although there are not many producers' cooperatives, some of them (e.g. KEVILI) are active in organising field days and other events and advising farmers. Organised events often have high participation and some of them are recorded and so made available for a wider viewing audience.

## Forestry

There are about 113,000 private forest owners in Estonia, among whom more than 14,100 have joined forest cooperatives (that own over 578,000 ha, ie almost half of the total area of private forest land). There are almost 30 active forest cooperatives in Estonia<sup>25</sup>.

The state continues to influence forest owners' forestry practices: although accredited private advisors provide advisory services, they are paid by the state. The leading unit for disseminating knowledge in the field of forestry is the **Estonian Private Forest Centre** (established 1999 as a result of Phare Project). This is government foundation whose objectives are raising competence of private forest owners and promoting environmentally friendly and effective private forestry. Main tasks of Estonian Private Forest Centre are: administrating national and EU subsidies for private forest owners (incl. forestry advisory support as well as the organization or ordering of sectoral training and information days); developing private forestry support system; other development activities related to private forestry. The state provides relatively high freedom to forest owners for management<sup>26</sup>.

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<sup>25</sup> <https://www.eramets.ee/metsauhitud/> November 2020

<sup>26</sup> Lawrence, A etc (2020)

The **Estonian Private Forest Union**<sup>27</sup> was established as an organization by the most active forest owners in 1992. It is an umbrella organization for local forest owner associations and altogether 20 local associations are members, representing about 1/3 of Estonian private forest land.

Advice to private forest owners is provided by advisors of **private forest associations/cooperatives**, most of them have joined the Estonian Private Forest Association. Local forest owner associations have been set up to unite individual forest owners on a county or community level. The local private forest entities are called cooperatives (in Estonian *ühistu*), but they are NGO-s in juridical form. Trainings for private forest owners are organized by the same forest associations, and the Private Forest Centre as well as private trainers. Private trainers have also used support measures managed by the Ministry of Rural Affairs and described in RDP to finance the trainings.

The forestry advisors are employed or contracted by these private forest associations/ cooperatives. According to RDF, 12 of total 46 certified forestry advisors have a contract also with RDF, to provide advice to those farmers, who also have forest.

According to the interviews, advisors rely on the mailing lists or news-feed on social media for training opportunities. Digital media is an important part of our lives. There is actually enough forest science, but finding the results is relatively difficult. From the interview: “It should be made public by the person carrying out the study, as this study must have a meaning. Public opinions approach to forest management is nowadays based on faith, not research or practice”.

## Fisheries

Fishing is divided into trawling on the Baltic Sea, coastal and inland fishing and long distance fishing. 1700 licensed fishermen are active in coastal fishing on the Baltic Sea and there are 101 fish processing facilities in Estonia, most of them are small enterprises with less than 50 employees.

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<sup>27</sup> <https://erametsaliit.ee/>

The purpose of the activities of the **Fisheries Information Centre** is to coordinate the cooperation between the fisheries and the aquaculture sector, anglers' organisations and researchers as well as to order and coordinate relevant studies and pilot projects being of interest for the aforementioned target. In cooperation with scientists and researchers, the Fisheries Information Centre collects, analyses, distributes and publishes relevant information concerning the fisheries management and fishing industry as well as aquaculture sector including the processing and marketing of aquaculture products. The centre is established in 2011 under the supervision on Estonian Maritime Institute, University of Tartu.

The Fisheries Information Centre makes close cooperation with fisheries areas, enabling the **Fisheries Local Action Groups** (FLAGs, 8 in total) to provide comprehensive information, knowledge and assistance for the implementation of their action strategies.

Over time, joint activities have become more active, there are six **fisheries producer organizations** in Estonia, and the central umbrella cooperative uniting producer organizations<sup>28</sup>. The Estonian aquaculture sector is characterized by a high degree of fragmentation between several small-scale products and production methods; Also in coastal and inland fisheries, joint production and marketing are not yet widespread. Companies operating in the fisheries sector have a long tradition, know-how and experience, and have begun to develop and introduce new processing equipment with state-of-the-art technological solutions and environmentally friendly farming technologies<sup>29</sup>.

As the aquaculture sector is small, there is not a sufficient market for veterinarians and advisors specializing in the Estonian aquaculture sector. At the same time, there is a shortage of skilled labor, demanding a lot of manual labor and usually paying low wages.

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<sup>28</sup> <https://www.agri.ee/et/eesti-kalapuugi-ja-vesiviljelussektori-tootjaorganisatsioonid>

<sup>29</sup> MRA (2020) Draft "Development Plan for Agriculture and Fisheries until 2030" <https://www.agri.ee/et/eesmargid-tegevused/arengukavad-ja-strateegiad>

## Digitalisation level

Based on data prior to the pandemic, Estonia ranks 7th out of the 28 EU Member States in the 2020 edition of the European Commission's Digital Economy and Society Index (DESI)<sup>30</sup>. While Estonia ranks 1st in the EU in Digital public services (with its well-developed e-government and e-health systems, with all central government services, as well as municipalities providing services online), it scores slightly below the EU average on the **Integration of digital technology**. To boost the digital transformation of the Estonian economy, it is important that Estonia continues and strengthens its efforts to raise awareness of the benefit of better integrating digital technologies, particularly for SMEs.

As regards broadband, 62% of rural households in Estonia are covered by next generation access (NGA) broadband (EU average in rural areas is 59%; total coverage in Estonia 84%). The level of digital skills in Estonia is above the EU average: 62% of the population has basic or above basic digital skills (the EU average is 56%); in rural area the percentage is lower (57%), but still well above the corresponding EU average (48%)<sup>31</sup>.

Estonia has made steps for the use of agricultural big data. The aim is to build up a platform where all agricultural data can be combined and used for production and communication with authorities. This would be an open source system to enable the private sector, to use data in a more effective way, such as precision agriculture.

The interviewers pointed out, that advisors and farmers consider other entrepreneurs as an important source of information. Although the impact of media cannot be considered insignificant. As newsletters and social media postings provide mostly information with news-value, only some news contain information about research and innovation results or best practices of agriculture<sup>32</sup>. The main digital media websites are managed by business-oriented companies ([www.pollumajandus.ee](http://www.pollumajandus.ee), [maaleht.delfi.ee](http://maaleht.delfi.ee)). There is one agricultural magazine (Farmers Notifier, *Põllumehe Teataja*) and the use of specialised social

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<sup>30</sup> European Commission. *Digital Economy and Society Index 2020. Estonia*

<sup>31</sup> EUROSTAT [isoc\_sk\_dskl\_i].

<sup>32</sup> Exploring digitalization ..., CASA, (2019)

media groups (for dairy farmers etc) grows more familiar. NSU regular digital newsletters provide articles about innovation examples both domestic and international. A lot of information is channelled through social media and mailing lists, but the websites of state authorities and organisations are most useful, regarding advisors.

## Overview

There are three universities and several research institutes for agriculture, processing of food, forestry, fisheries and aquaculture. In addition, there are vocational education centers that offer vocational education in the field.

The established agricultural advisory system (led by Rural Development Foundation) connects individual advisors to the organization providing advising services. In order to maintain and increase the quality of advisory services, lifelong learning is necessary.

Knowledge transfer programs and innovation clusters have been launched in recent years, to improve the organization of information activities and foster innovation in the field of agriculture and food. The fisheries and forestry sectors benefit from the system, where there are designated bodies for the whole knowledge and innovation dissemination concept.

The cooperation and information exchange between the public and private advisors and between the production areas can be developed further. There is a need for a central organization dedicated to the dissemination of knowledge: *“The rate of stupidity is growing. Estonia also needs a separate popularization department, where people could explain the complicated information”*.<sup>33</sup>

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<sup>33</sup> Agricultural Research Centre (2020) The knowledge transfer study

## 2.2. AKIS diagram

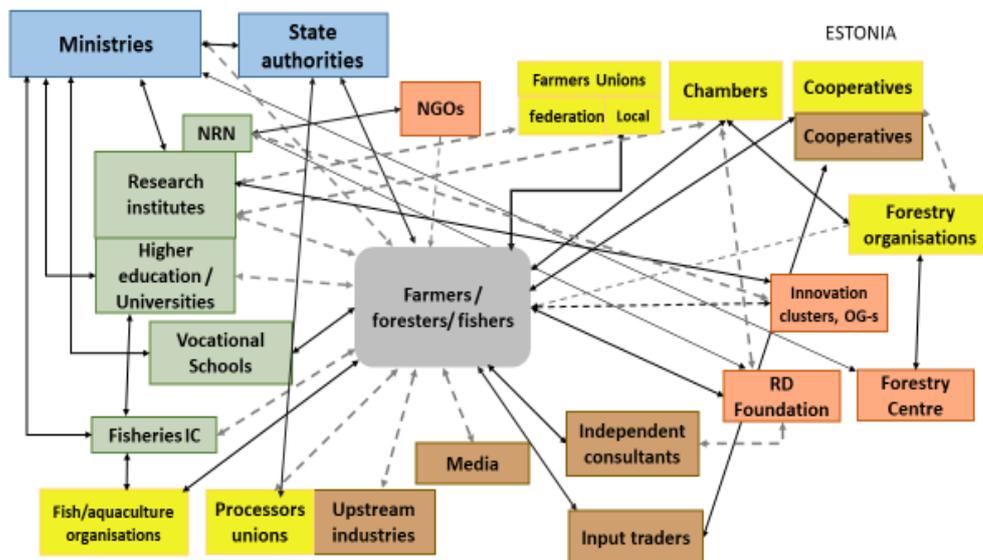
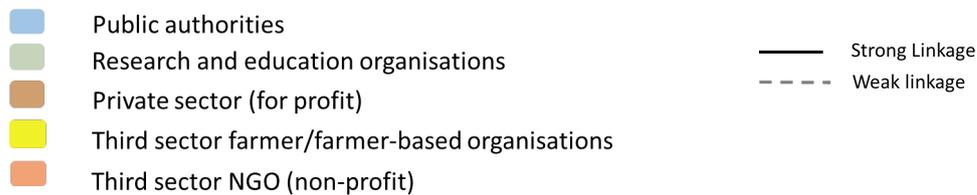


Figure 7. Estonian AKIS diagram



### 3. History of the agricultural advisory system

Just as there are several words describing dissemination of information (advisory and extension) in the world, separate activities have been emphasized and funded in Estonia: either advice and dissemination of information, or support for training and information activities. Advice is interpreted more broadly than just the advice of a professional advisor, it means also getting advice from an acquaintance, expert, etc. without a formal agreement. Farmers are not able to determine exactly whether the information was obtained through advice or training<sup>34</sup>.

The Estonian advisory activities were supported since 1920 with the establishment of advisory bureau in 1928<sup>35</sup>, but the timeline was interrupted by the soviet regime. The history of Estonian modern agricultural advisory service goes back to 1989 (foundation of local farmers organisations) and it has been changing ever since.<sup>36</sup> The first modern advisory services system was organized by the Farmers` Federation in 1991 (the year of restoration of independence) and included advisory centres of regional (county) farmers unions, and the Jäneda Advisory and Training Centre. In 1993 and 1994, projects with foreign partners (from Denmark and Germany) were implemented to support the development of advisory services. The Estonian Association of Rural Consultants was established in 1994.

Estonia has been implementing advisory support for farmers since 1995 and, and since 1997 - the support for group activities (with the help of Phare project, British Know-How fund and World Bank loan). The support for the activities of individual advisors has evolved through the support for the activities of county centres and co-ordination centres, up to one national advisory organization. In order to improve the qualification of the advisers, certification of advisors started in 1997 (the training of advisory methods was carried out by DLV Agriconsult BV, Netherlands). The farm advisory services and the Farm Advisory System were financed from the state budget, from the European Agricultural Fund for Rural Development and by farmers.

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<sup>34</sup> Agricultural Research Centre (2019), Advisory systems and advisory tools (2008)

<sup>35</sup> Ministry of Agriculture (2006),

<sup>36</sup> Look at the development of Farm Advisory System in the PRO-AKIS country report (1989-2013)

The Estonian advisory system has been reformed more than 10 times over the years, but not much has changed in the course of these reforms: funding flows remained largely the same, support rates, conditions for regional centres and the location of the coordination centre changed. Agricultural extension and advisory services until 2013 were provided by local advisory centres mainly related to producers or farmers' unions, one in each county (15 in total). The advisors of Estonian Farm Advisory System were all working for a local centre on contractual basis and most advisors were self-employed.

Since 1 January 2010, the Estonian Rural Development Foundation (RDF) is coordinating the Farm Advisory System; the contract was renewed in 2015 as a result of public procurement. An advisory centre was designated to ensure the functioning of the Farm Advisory System. The RDF provides back-office for all the advisors and local advisory centres, including trainings, developing advisory tools etc. RDF maintains the [www.pikk.ee](http://www.pikk.ee) portal that also hosts the main calendar for agricultural events.

According to the PRO AKIS project report (2014): "For several years there was a search for a joint Estonia-wide agricultural and rural economy organisation to unite advisers, which could take the central role in developing the advisory system, providing exchange of information, collaboration with stakeholders, providing support services to advisers, and which could be in charge of sharing workloads. Experts from the Ministry of Agriculture indicate that given the size of Estonia and the interest for advisory centres, the advisory system needs to be optimized by the state."

More than 50 advisors are related to the RDF. There are also a number of agricultural advisors providing services to farmers, working independently from the RDF. So, an Estonian producer can either get RDP supported advice from the advisors at RDF or can use the services of private advisors (not supported by RDP).

The support of information days and trainings has mostly been based on the division of needs into either county or national ones. Various calls for proposals (1998–2001) and application rounds (2002–2019) and the principles of forming evaluation committees (eg deciding county needs under the leadership of county governments; with the help of the paying agency's regional offices) have been tested. Since the funding period 2004–2006, support has been provided for the organization of agricultural and rural training and the publication of information



materials at two levels: county and national activities. In the ERDP 2014–2020 period knowledge transfer programs were added, they began to consolidate the activities submitted in the application rounds of national activities.

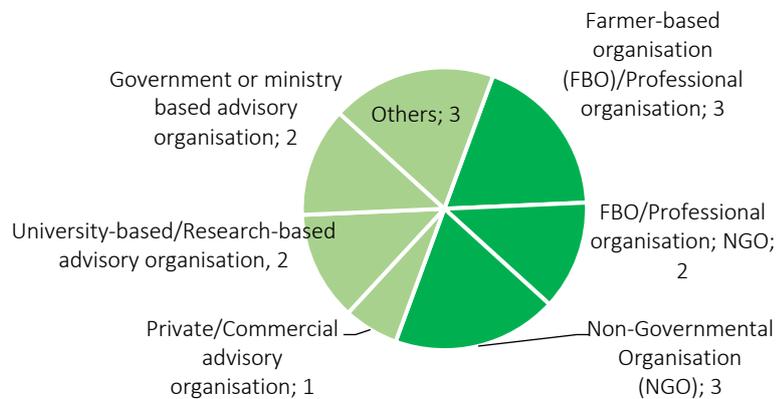
## 4. The agricultural and forestry advisory service(s)

The report covers the national framework, context and policies which have impact on the 'agricultural knowledge and innovation system' (AKIS), including farm advice and related activities in Estonia; particular focus is given to the Rural Development Programme (RDP). The report covers also actions regarding knowledge transfer and innovation in the field of forestry, fisheries and aquaculture.

The implementation of the i2connect study involved three phases: (1) a desk review based on a focused documentary and literature review, (2) interviews and (3) web-based survey. For this report, three special interviews were conducted. In addition, insights from other interviews, conducted by the author during other studies regarding AKIS in Estonia were used (see paragraph 6). For this report, special web-based survey was organised with unified questions for all countries related to i2connect project. The link to questionnaire was sent to 96 organisations (incl research institutions, farmers organisations etc.), 120 advisors (regardless of their affiliation with organisations). 16 organisations (response rate 16%) and 10 freelance advisors filled the survey (see Annex 2).

The web-survey is representative regarding the fields of agriculture or fisheries. In Estonia there is one main agricultural advisory organisation and some organisations, where is advisory component. There are some fisheries and aquaculture organisations, but no freelance advisors. In the field of forestry, answers are scarce: only one representative of forestry organisations answered to the web-survey, although there is more than 30 forestry cooperatives/associations. There is no freelance forestry advisors in Estonia.

The organisations representation to the survey was balanced: most of the represented organisations are national (63%, 10), three claim to be regional and 3 sub-regional. 50% of the responded organisations are farmer-based, professional or non-governmental (figure 8). In category "others" were Paying Agency, dairy farming supplies and services provider and state owned business, operating in private law.



**Figure 8.** Categorisation of responded organisations (n=16)

Out of 10 responded freelance-advisors, 3 are full-time advisors; most of them work nation-wide, one internationally. 50% of them have national advisory certificate.

## 4.1. Overview of all service suppliers

In Estonia, the different components of AKIS have been made available to the producers and other interested parties.

Farmer can either get RDP supported advice or can use the services of private advisors. The Rural Development Foundation (RDF) is the only organisation eligible for RDP advisory support, so all advisors offering RDP-supported advice need to have an contract with the RDF. More than 50 advisors are related to the RDF. There are also a number of agricultural advisors providing services to farmers, working independently from the RDF.

Forest associations, the Estonian Private Forest Association and the Private Forest Centre as well as private trainers organize trainings for private forest owners. In some cases, the actions are supported through RDP, different innovation projects or state budget (domestic support schemes in the field of forestry and grants for nature education etc.).

The information dissemination in the field of fisheries and aquaculture is organised through the Fisheries Information Centre, there is no specialised advisors due to the low number of potential clients.

There are different associations, unions and societies that unite the farmers and producers working within the same field of agriculture (dairy, crops etc.). Different kinds of co-operation are also promoted through LAGs and producers' cooperatives in general.

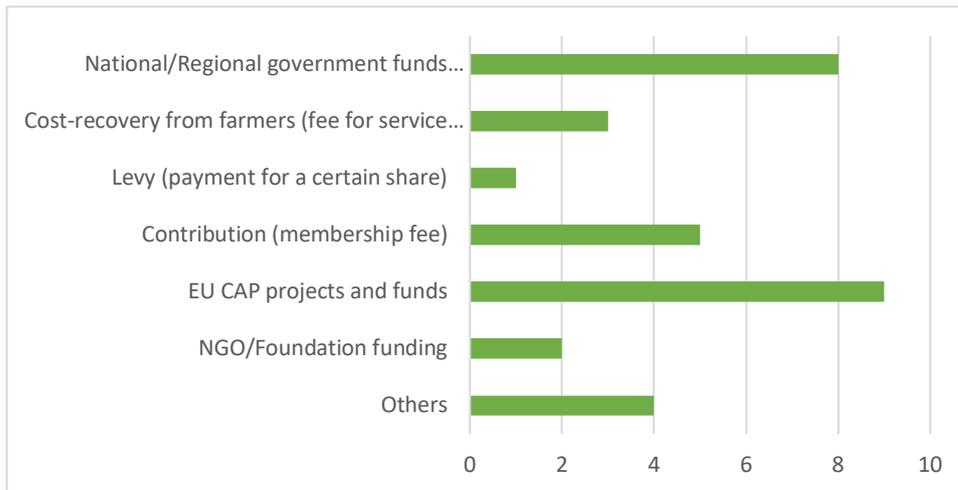
## **4.2. Public policy, funding schemes, financing mechanisms, advisory service providers**

About 50% of the CAP expenditure of Estonia was foreseen by RD measures, which is substantially higher than the EU average (about 25%), while the share of direct payments is 49% and the share of market measures is less than 1%<sup>37</sup>. Support for agriculture, food industry and rural development is paid within the EU Common Agricultural Policy (CAP) from the European Agricultural Guarantee Fund (EAGF, CAP Pillar I), the European Agricultural Fund for Rural Development (EAFRD, CAP Pillar II) and the state budget according to RDP and state aid rules. In 2019, a total of € 308 million was paid in subsidies to agriculture, the food industry and rural development, of which 85% was from the EU budget.

The implementation of the priorities of the European Union 's Common Fisheries Policy (CFP) is funded by the European Maritime and Fisheries Fund (EMFF). The support for forestry is funded by Estonian state budget.

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<sup>37</sup> Case study report – Estonia (2020)



**Figure 9.** Primary sources of funding for organisations (n=16)

The respondents of the survey show high dependence on grants (Figure 9): EU CAP projects, including RDP; national or regional projects and EMFF (European Maritime and Fisheries Fund<sup>38</sup>). Cost recovery from farmers, levy, membership fee and revenue from the sale of goods<sup>36</sup> are the financing options for private cooperatives and producer organisations. Six respondents (37,5%) confirmed the change of organisations budget more than 10% in the last three years. The LAG and innovation cluster's budget depends on the success in applying grants for projects; the cooperatives and input traders budget depends highly on the performance of producers/clients.

### Agricultural knowledge transfer

The RDP provides an opportunity to support training and reporting activities. The activities supported include training and information days, training itself and training cycles, courses, conferences and study excursions for those operating in the agriculture, food and forestry industries. The production, purchasing and updating of information and training materials are also included under the support. The main target group for advisory and training support are producers involved in the production or processing of agricultural products and their workers or companies and individuals involved in forestry.

<sup>38</sup> EMFF and revenue from the sale of goods were mentioned in category "others".

In the programming period 2014-2020, Estonia allocated 4.44% of the total rural development budget for M1 (knowledge transfer and information actions), M2 (advisory services, farm management and farm relief services) and M16 (co-operation). This is above the EU28 average of 3.63%<sup>39</sup>.

**M1 - knowledge transfer and information actions** - is supported as single national/county level projects or as long-term knowledge transfer programme implemented in 8 selected topics. The knowledge transfer programmes are targeted to a certain topic and contain a wide set of activities (e.g. information days, trainings, conferences, demonstration activities, information materials) supported in a combined and coordinated way and implemented by a consortium of several organisations. Programmes are structured in a similar way and run for 4 years (started at different times, the first ones in 2015). In 2021, the MRA is planning to make a new call to cover seven presently running programme topics as one single large programme. National and county level training projects are much smaller and contain one type of activity

The support of information days and trainings has mostly been based on the division of needs into either county or national ones. Various calls for proposals (1998–2001) and application rounds (2002–2019) and the principles of forming evaluation committees (eg deciding county needs under the leadership of county governments; with the help of the paying agency's regional offices) have been tested. Since the funding period 2004–2006, support has been provided for the organization of agricultural and rural training and the publication of information materials at two levels: county and national activities. In the ERDP 2014–2020 period, knowledge transfer programs were added, which began to consolidate the activities submitted in the application rounds of national activities. According to the MRA<sup>40</sup>, the target value of participation is exceeded (126%).

Many other measures and activities also indirectly affect information dissemination systems:

- ERDP investment measures, primarily with regard to the need to involve advisors and provide information regarding the requirements of support;

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<sup>39</sup> Agricultural Research Centre, Study on knowledge transfer (2019)

<sup>40</sup> MRA (2020) RDP annual implementation report for 2019

- Support for the development of short supply chains and local markets, especially in terms of network formation;
- ERDP environmentally friendly management, animal welfare and organic farming measures through mandatory training for applicants;
- activities of local action groups (LEADER-type measure) and producer groups through training of members;
- national rural network through information activities for the public and beneficiaries;
- information days and conferences organized from the own resources of professional organizations or with the support of sponsors;
- presentations and conferences introduced by companies that sell or buy production inputs;
- advice, mentoring, trainings, conferences by county development centers (main concerns in the field of non-profit organizations and the food industry);
- consulting, trainings, etc. funded by the Private Forest Center Foundation in the field of forestry;
- training and information activities funded by the Environmental Investment Center, regarding the information of preserving the nature and habitats;
- public training order of the Ministry of Education and Research with the support of the European Social Fund in vocational education institutions or professional higher education institutions providing vocational education to adults (incl horticulture etc);
- labor market training offered by the Estonian Unemployment Insurance Fund and support for starting a business.

**M2 - Advisory services**, farm management and farm relief services includes aid for the use of advisory services (implemented through one single FAS coordinating organisation, RDF, see in the sections 2.1 and 3) and aid for training of advisors. Training of advisors is implemented with separate public procurements organised for each training. All licenced advisors can participate in these trainings, not only the ones contracted by RDF.

The amount of agricultural advisory support per client or contract is limited (up to 3000 € per client per year), and the support rate has also varied (50–90%), depending on the amount of service requested by the client or the field of service. In addition to the advisory support, short-term advice (up to 2 hours per client) was also supported on significantly simpler terms and is free of charge for the

client. The high increase in the number of contracts is related to the fact that from 2018 advice is supported for submitting support applications (using the customer portal of the ARIB). When Estonia implemented a mandatory digital application system for all measures a lot of producers (especially older ones) needed help using the system. Before 2018 a similar service was offered to producers which was supported by the state.



**Figure 10.** Number of supported (one-to-one) advisory contracts in 2008-2020. **Note:** short-term contracts were not supported by RDP up to 2018. Number of contracts in 2018 includes also short-term contracts. (Source: ARIB 02.11.2020, Agricultural Research Centre)

Interest in advisory services has fluctuated over the years (see figure 10). Changes in the conditions of advisory support have significantly affected the use of advice, the functioning of the system and its reputation among advisers. Advice on animal husbandry and crop production remained stable over the years (taking into account seasonal fluctuations depending on the growing season), but the amount of advice on supported economy topics depended most on the investment support application period and advisory support rate (support 90%, 75% or 50%)<sup>41</sup>. A 2018 survey on agricultural advisory services<sup>42</sup> showed that larger companies rely somewhat more on consultants of the input companies than they do on supported advisory services.

In the period 2014–2020, advisory support is only available to primary producers of agricultural products and access is not available to forest landholders, rural food

<sup>41</sup> Agricultural Research Centre, 2019. Study on knowledge transfer

<sup>42</sup> University of Tallinn, 2018.

production companies, start-ups, rural communities, producer groups and innovation projects. Mentoring programme in agricultural advisory system is rather new (from 2016) and not widely used yet. Mentoring is a collaboration, sharing the knowledge and experience of successful and experienced farmers with less experienced farmers. The mentoring service is fully supported (support rate is 100%) up to 25 hours/year and is implemented under RDP. This programme has high potential but there have been some obstacles affecting the uptake. The mentoring programme is aimed at small farmers whose last years' sales revenue was 1200 to 100 000 euros. As one of the conditions was related to the previous year's turnover, the farmers starting new enterprises couldn't apply for this support in the first year(s). An aspect to be mentioned is the fact that many producers may not be aware of mentoring opportunities and there is a need for a wider promotion of mentoring support.

The components of **measure Cooperation (M16)** are activities of Innovation Cluster and Development of New Products, Practices, Processes and Technologies, incl. European Innovation Partnership operational groups. Innovation clusters are aiming to encourage broad cooperation between producers, processors, researchers and advisors. The measure is designed based on EIP principles but widened according to the specific needs of the sector. Support is based on 4-year action plans designed by NGO-s consisting of producers/processors with research/development organisations and some traders as partners, linking to execute common innovative actions. In the end of 2019, support was granted for 43 innovation cooperation projects<sup>43</sup>, but officially, only two EIP operational groups have been implemented for the year 2020<sup>44</sup>.

Estonia has a strong public research system, but weak innovation in firms. Research necessary for Estonian agriculture, food industry, fisheries and rural life is carried out in several universities, institutes, technology development centres and competence centres. The competencies of Estonian research and development institutions are diverse and international research cooperation in the field has become increasingly active. The shortcomings of the innovation system are partly linked to the relatively small size of Estonian companies. The most innovative companies in Estonia are the subsidiaries of foreign companies

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<sup>43</sup> MRA, (2020) RDP Annual implementation report for 2019

<sup>44</sup> Case study of Estonia (2020)

and foreign-owned companies. In the agricultural sector, innovation is facilitated by suppliers of equipment and materials<sup>45</sup>.

According to the interview with MRA, the small size of Estonia is good for knowledge transfer, but it is also an obstacle regarding research. The low number of researchers has its limitations for applying for grants (no time to do enough). MRA is operating the applied research programme for agriculture, including co-financing for international programs. In academic world, the focus is towards scientific publications, not towards the needs of entrepreneurs.

### Forestry advice and knowledge exchange

The leading unit for disseminating knowledge in the field of forestry is the Estonian Private Forest Centre, which manages the support schemes for knowledge dissemination. As of 2018, advisory support may be applied for and received by a forest association/cooperative for advisory services provided to a private forest owner.

The forestry advisor is a forestry expert who has been awarded the advisors certificate in the field of forestry<sup>46</sup>. He or she has usually a university degree or vocational training in forestry, at least three years of professional work experience. A large number of forestry advisors have signed a declaration of independence, promising to ensure the impartiality and to avoid conflicts of interest. On average, one person advises 148 forest owners per year, the median average number of consultations per advisor is 132<sup>47</sup>. The dominant aspects for advice are renewal and afforestation, subsidies, Natura 2000 and the forest management plan. The support per one forest owner is 80 euros (expected increase in 2021 is up to 100 € per client). According to the expert interview, the support is not dependent on the duration of the service and usually one supported advice lasts 2-3 hours. These private forest owners, who are not members of forest associations, have to pay fully on their need for advice. According to the satisfaction survey on forestry advice<sup>48</sup> 96.2% of respondents found the advice they received from an advisor helpful or rather helpful. Over 90% of the

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<sup>45</sup> OECD, 2018

<sup>46</sup> The concept of forestry advisors profession is set out in the forest law.

<sup>47</sup> Private forestry Centre, 2020 (5053 forest owners advised by 34 advisors from 20 forest associations)

<sup>48</sup> Private Forestry Centre, 2019

respondents considered good or very good the important characteristics of the advisors, such as availability, communication skills, reliability and the quality of the advice.

A forest association with at least 200 members may apply for support<sup>49</sup> which includes: 1) group advice; 2) co-operation in the field of forestry; 3) the activities of the forest association; 4) the establishment of a school forest and the organization of activities. The support is 40 euros per member of the association, within the support for group advice is up to 500 euros per group advice, but not more than 2000 euros per year per association<sup>50</sup>.

Many agricultural producers have forest and these private forest owners, who have also farmland, can receive RDP supported forestry advice (measure 2.1) through RDF. The knowledge exchange actions can also receive funding from RDP (measure 1).

### Knowledge transfer regarding fisheries and aquaculture

The knowledge transfer entities regarding fisheries and aquaculture are **Fisheries Information Centre (FIC)** and **Fisheries Local Action Groups (FLAGs)**, 8 in total). The main funding for knowledge transfer and innovation comes from EMFF. According to the interview, there is unfortunately no professional advisors of the field, as there is not enough market even for part-time advisor. The entrepreneurs have to seek the help of universities, other practitioners or from abroad.

The Fisheries Information centre was established in 2011 under the supervision on Estonian Maritime Institute, University of Tartu. In 2011-2015, the activities of FIC took place within the framework of the measure "Other joint activities" of measure 3.1 "Joint activities" of the "Operational Program of the European Fisheries Fund 2007-2013".

The Ministry of Rural Affairs has established schemes for using grant for promoting the cooperation between scientists and fishers or aquaculture operators in 2015. The activities in current period will take place in the framework of Measure 1.3, "Grant for the Promotion of Cooperation between Scientists and Fishermen" and

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<sup>49</sup> <https://www.eramets.ee/toetused/uhistutoetus/>

<sup>50</sup> Private Forestry Centre, 2020

Measure 2.6, “Grant for the Promotion of Cooperation between Scientists and Aquaculture Operators” of the EMFF Operational Programme. The research actions are selected regarding the decisions of the FIC Board. The final date of the activities of the Fisheries Information Centre shall be 31 December 2022.

The Fisheries Information Centre makes close cooperation with fisheries areas, enabling the FLAGs to provide comprehensive information, knowledge and assistance for the implementation of their action strategies.

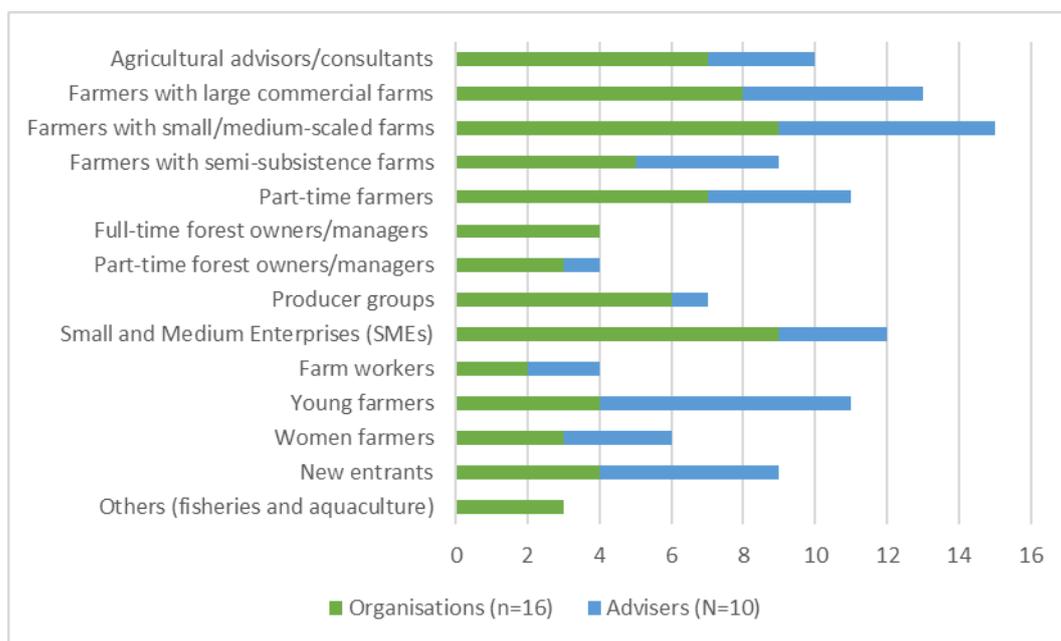
### 4.3. Clients and topics/ contents

According to the knowledge transfer study<sup>51</sup>, in the period 2016–2019, farmers and food processors, as well as companies in other sectors, have used the advisory service / consultation mainly on the application for support and preparation of the necessary documentation, as well as on accounting and tax issues. Almost half of both farmers and food processors used the service of applying for subsidies and preparing the necessary documentation (46% and 44%, respectively). Advice on accounting and tax issues was used by 34% of farmers and 38% of food processors. Among farmers, the most popular topic was crop production (77%). The most important trainings for food processors were related to food hygiene, safety and handling. Farmers and other entrepreneurs’ value study circles, farm visits and demonstration activities. Visiting foreign countries is also active, and in parallel, so-called agro-businesses organize study trips. Study trips encourage cooperation and cooperative activities. There is a lot of information exchange on crop topics in the form of field days, and the so-called field walk form is becoming popular.

According to the i2connect web-survey, the main client groups for the organisations, providing advice are farmers with small/ medium-scaled farms and Small and Medium enterprises.

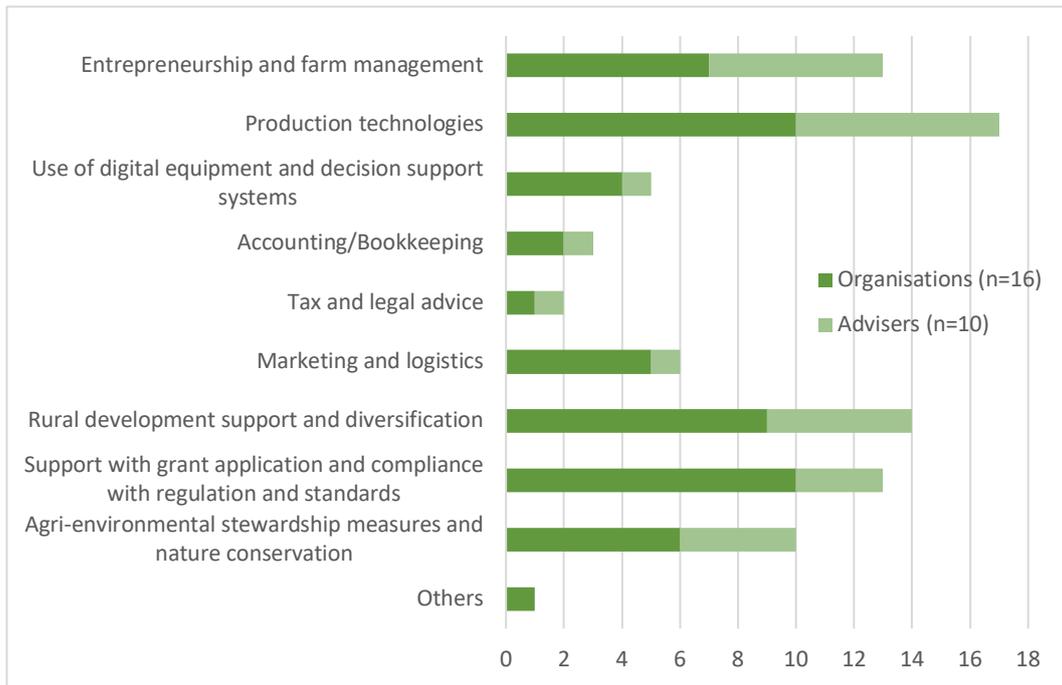
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<sup>51</sup> Agricultural Research Centre, 2019



**Figure 11.** The main client groups

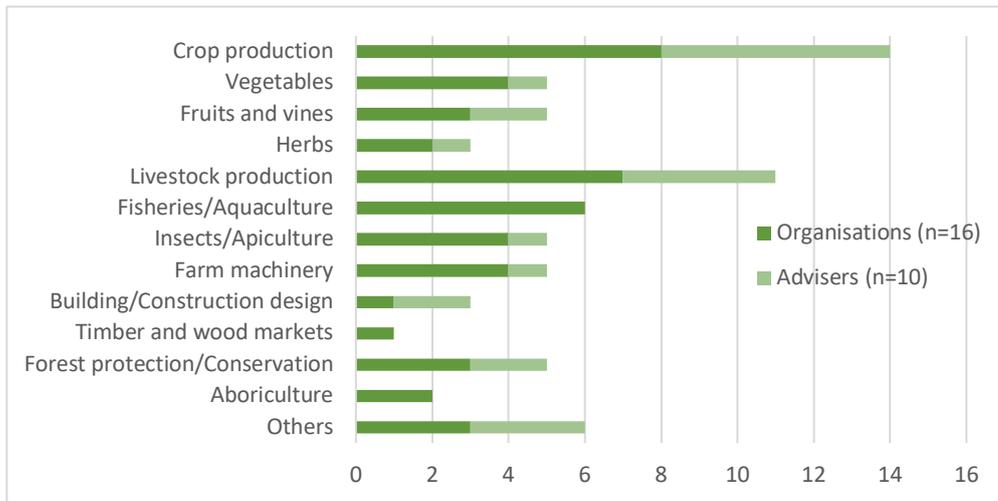
Regarding the responses to the web-survey (Figure 12), the main fields of advice are related to production technologies and entrepreneurship, as well the compliance of legal requirements or applying for support. Bookkeeping and taxes are usually not the issue of an advisor regarding the advisory providers, this is considered as regular paid service.



**Figure 12.** The cross-cutting advisory topics

Main production areas, crops and livestock, need more attention, as other fields were mentioned relatively equally (Figure 13). Other topics: processing industry and services; advice for applying subsidies; organisation of trainings and information actions; poultry farming, occupational safety, financial management.

The ranking of topics is representative regarding the fields of agriculture or fisheries. (In Estonia there is one main agricultural advisory organisation and some organisations, where is advisory component. There are some fisheries and aquaculture organisations, but no freelance advisors.) In the field of forestry, answers are scarce: only one representative of forestry organisations answered to the web-survey, although there is more than 30 forestry cooperatives/associations.



**Figure 13.** The advisory topics

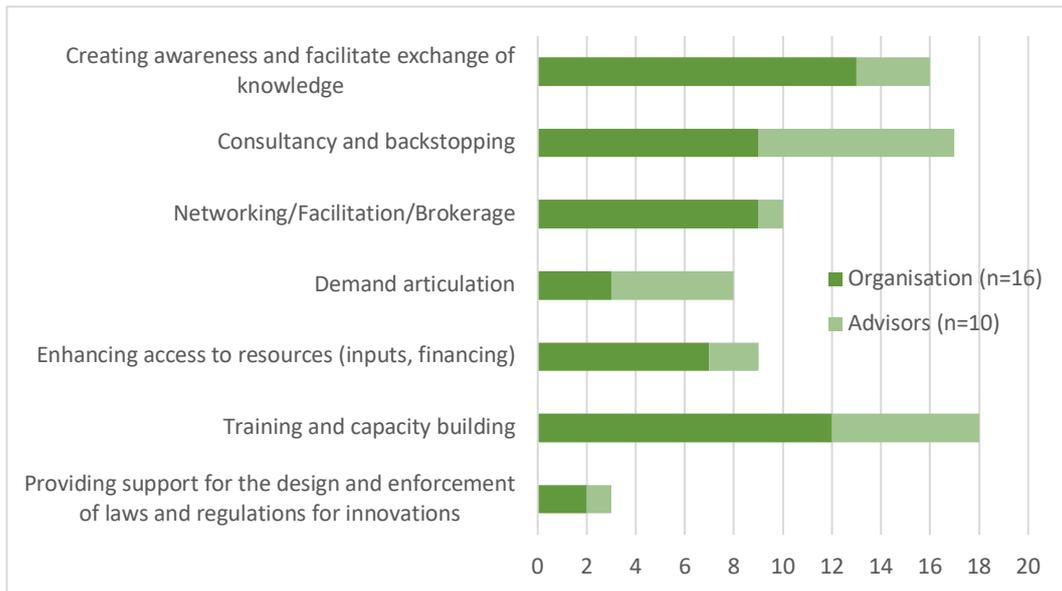
Six out of 16 respondents (38%) confirmed that they outsource some advisory topics to external consultants: best methods of bee-keeping, fish farming, applying for RDP subsidies. One respondent added: *“We have really good co-operation with scientist and exerts in our region. Our organisation is the intermediary of knowledge.”*

The number of clients varies a lot regarding the scope of the organisation:

- 20-50 clients in the fields of bee-keeping or fisheries/aquaculture;
- 100-150-300 clients in the field of national organisations, who have regular contact with the farmers, fishers and other producers;
- 3000 clients for the national advisory office;

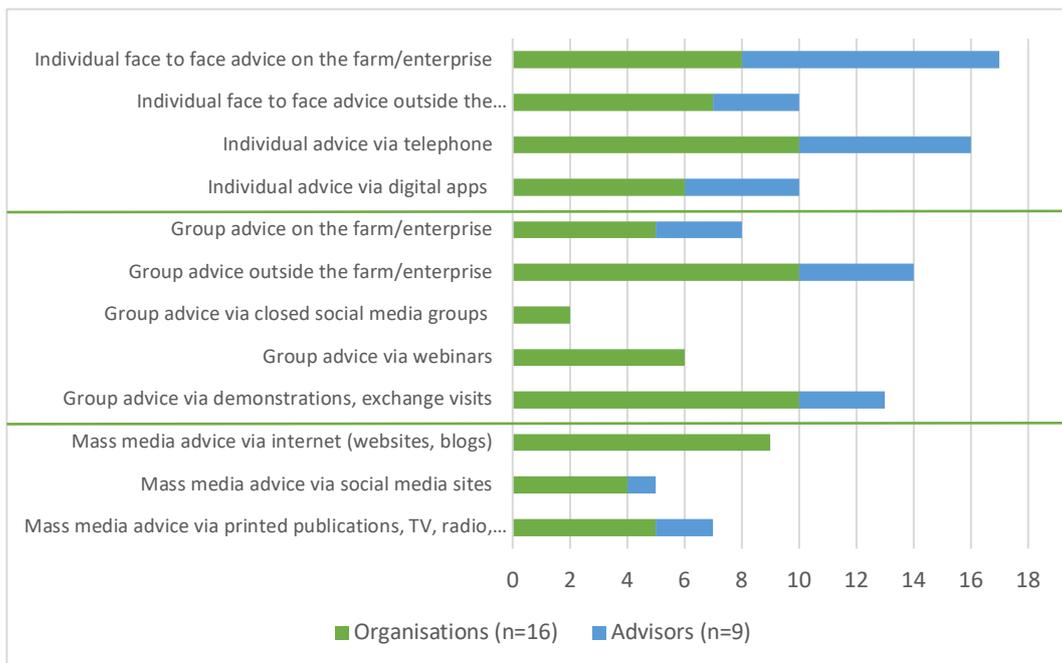
The number of clients per freelance advisor varies depending on the time allocation. The full-time advisors have 30-70 clients for average year; part-time advisors have 6-15 clients. A certain advisor, who works also internationally, has 45 clients even as he claims to be part-time advisor.

The main advisory activities are classical individual advising and training. Comparing the answers, organisations with advisory component see more the need to create awareness and facilitate exchange of knowledge, as freelance advisors encounter that need less frequently. Among other, the clients need help from advisor on demand articulation i.e. identification and communication of different needs.



**Figure 14.** The main advisory activities

Individual advice is the most expensive way of transferring knowledge, the most common method of knowledge transfer is organizing information days and trainings and publishing materials (according to expert interviews and surveys).



**Figure 15.** Advisory methods (Question “Which advisory methods are most frequently used”)

Regarding the web-survey, there is no clear picture on the overall preferred advisory method - proportion depends on the profile of the overall organisation or individual preference of the person. The individual advice is provided mainly on the farm or via telephone (Figure 15). Regarding the interviews, individual advice outside the farm/enterprise (in office) is dominant in the field of economics. Group advice is organised as information days or trainings in a classroom or via demonstrations on the spot (in a farm or experimental centre). Group advice via closed media groups is not common and probably depends on the age of farmers and advisors; social media groups are used among agricultural students. The reluctance to use distance methods (webinars, social media etc) for advisory methods will probably soon change due to the overall social distancing.

COVID-19 pandemic has changed the use advisory methods (58 %) for organisations and freelance advisors both. There are less physical meetings or seminars (cancellations change to webinars or to individual meetings) and there is a need to keep distance on the field days. The number of larger training days have reduced, information is shared in smaller groups and via YouTube video; group counselling through webinars grew rapidly. There are less face to face meetings, individual meetings are partly replaced by remote support meetings and more advisory work is organised by phone and Skype.

#### **4.4. Human resources and methods of service provision**

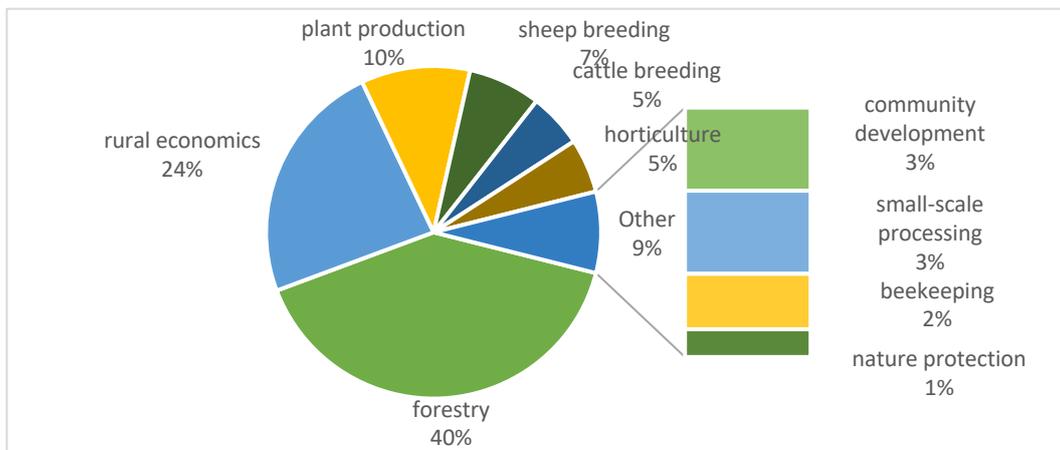
In all branches of agriculture and the food industry, the problem is the aging of the skilled workforce, labour shortages, and the low motivation of young people to work in the agricultural and food sector. In 2016, the number of farm managers that had attained basic training was lower than EU average (11% and 23% respectively). On the other hand, Estonia has higher than average number of farm managers with full agricultural training: 29% against EU average of 9% (for managers under 35 the share was 37% and 22% respectively).<sup>52</sup> Agricultural

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<sup>52</sup> European Commission. CAP context indicator C.24 Agricultural training of farm managers. Based on EUROSTAT [ef\_mp\_training] Most farm managers in the EU only have practical experience (68 % in 2016).

knowledge for employees is mostly gathered in the course of work, rarely in level studies, but rather in trainings and one-off information days.<sup>53</sup>

In support of the advice, MRA and the Ministry of the Environment have both been of the opinion that the supported advice is based on advisors with verified competencies and that the profession is awarded in accordance with the principles of the European Qualifications Framework. The certification board, hosted by Agricultural Research Centre, evaluates the advisors. As of 25th November 2020, there were 109<sup>54</sup> advisors with a valid professional certificate and 113 valid professional certificates as one advisor can have certificate in more than one field. Most certificates have been issued in the field of forestry – 46 (42%, Figure 16). There are 27 professional advisors in the field of economics of agriculture, 12 in the field of plant production, 6 - cattle breeding, 8 - sheep breeding, 6 - horticulture and 3 in the field of small-scale processing. Three community development advisors have also valid certificates, although advice in this area is not supported.



**Figure 16.** The number of professional advisory certificates

For organisations, who provide supported advice, the national certification of individuals is important. All advisors providing supported services (in forestry and agriculture, both) have to have a valid professional licence. Requirements for receiving this licence are time-consuming and for the highly qualified specialists

<sup>53</sup> OSKA - Estonian Qualifications Authority (2017)

<sup>54</sup> Estonian Qualifications Authority public data, calculations of Agricultural Research Centre [25.11.2020]

who are potentially interested to work as advisors (beside other working tasks), it is more straightforward to become a mentor or provide paid advisory services. According to the results of the web-survey, the organisations, who provide market-oriented advice, appreciate more the practical experience and methodical skills for providing trainings. Only one respondent confirmed that the organisation has certification, staff development related to products and systems they are providing to the dairy farmers.

There are very small organisations providing advisory services where the number of employees is 1-3, and there are organisations who have large number of employees, but the proportion of advisers is close to “0” as the services are not called as advisory services. The organisations with 1-10 employees the share of advisors is 48%. In the organisations with 20-100 employees, the share of advisors is 36%. In three out of 16 responded organisations (19%) confirmed the change of advisors during five past years. In one organisation, there was downsizing to cut the costs but in two of them - an increase: *“Increasing complexity of knowledge and practices dairy farmers need to be aware of”* and *“We are farmers organisation and we intermediate knowledge and innovation.”*

As described in Case study report in 2020<sup>55</sup>, a representative of the MRA explained: “The advisory services in Estonia could be described as a „mixed“ system of supported and private advice providers. Farmer is free to choose whether he/she prefers supported advice from the certified FAS advisor or pays the full price to buy the service from the market (that is unregulated). One of the challenges for the AKIS in the next CAP is building better interaction and connections with the FAS and non-FAS advisors”.

Almost all of the current professional agricultural advisors work under Rural Development Foundation (RDF), providing the supported services. RDF has a ISO 9001:2015 quality certificate for organisation of advisory services<sup>56</sup>. As in the agricultural sector, older advisers (aged 50+) make up a significant part (61%) of the advisory system and a significant proportion of advisers in younger age groups are not ready to work as consultants. Many advisors do not work full time and

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<sup>55</sup> Evaluation of the CAP’s impact on knowledge Exchange and advisory activities (2020)

<sup>56</sup> <https://www.pikk.ee/nouandeteenistus/dokumendid/iso-standard-90012015-sertifikaat/>

have other duties (e.g. working at the same time at University) or having their own companies providing other services (e.g. book-keeping, trainings).

The advisory work is not attractive for many, as it depends on the season and the support rate per hour is low. Involving young people is difficult, as the advisor has to have a significant amount of knowledge and long-term diverse practical experience. According to the web-survey, 40% of the advisors have experience over 10 years and 4 % have experience up to 3 years. The younger generation is more likely to become an advisor for input selling companies or cooperatives. There is no advisors for fisheries or aquaculture. The training of advisors should be flexible and based on their individual needs. There is an expectation to have joint actions with all the persons, who do some kind of advising or innovation support services. There is a proposal for a new advisors programme to start on 2021, which aims to cover training opportunities and there are intentions to add recruitment activities in the new CAP period.

The Case study of Estonia (2020)<sup>57</sup> pointed out, that most of the agricultural production produced in Estonia is produced by large enterprises and many have their own specialists in both plant production and animal husbandry, so they don't have a need to use an advisory service. Another important reason is that a lot of advice is provided by the companies involved in selling agricultural inputs and/or buying production. They have enough financial resources to employ good specialists, but there is clearly a disadvantage as their aim is to sell their own products and therefore their recommendations are not independent. Although there are not many producers' cooperatives, some of them are active in organising field days and other events as well as advising farmers. In addition, some private advisors prefer to work independently and offer their service market-based.

Concerning integration within AKIS, better linkage of advisors and research/applied research and universities is needed in order to guarantee that advisors have up to date knowledge about new techniques/research and that researchers are aware of the producers' expectations. This remains one of the main challenges in the coming years.

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<sup>57</sup> Case study report – Estonia. (2020)

## 4.5. Linkages with other AKIS actors/knowledge flows

There are many educational and research institutions in Estonia that deal with the bioeconomy, i.e. biological resources, agricultural activities and food science. The level of research institutions is good, but the role of adding value to the advisory service and training can be elaborated.

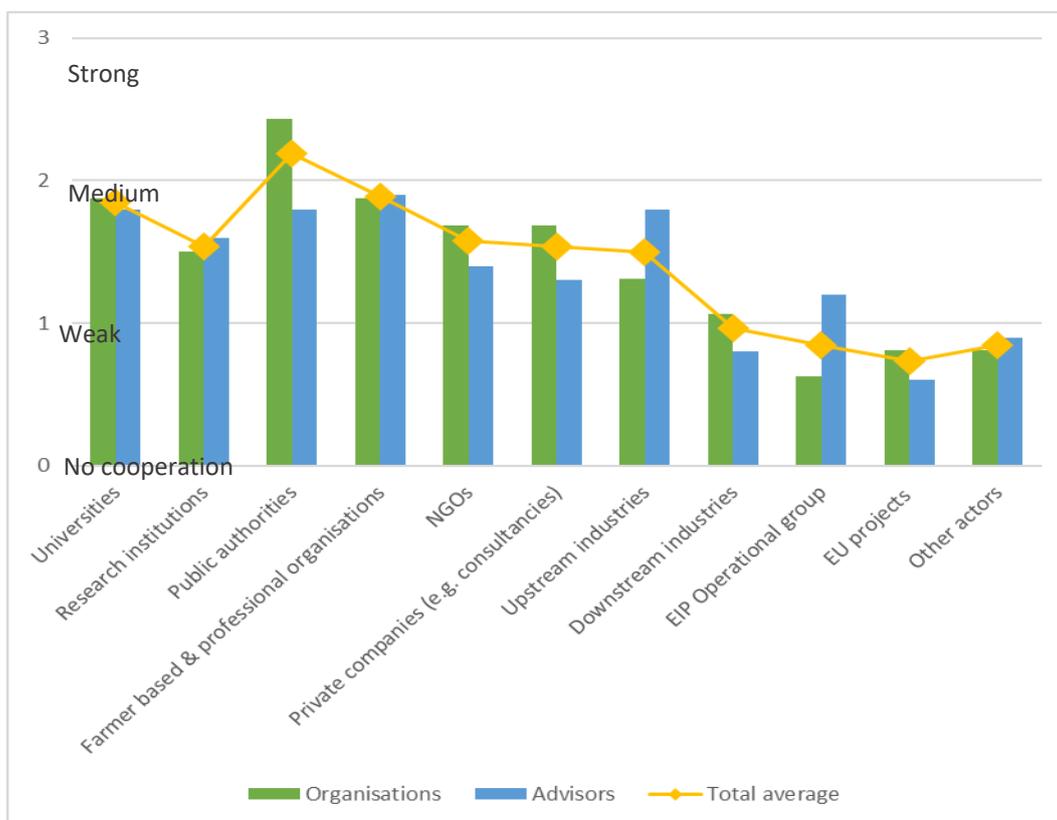
Teachers and researchers could be the ones who complement the advisors. In practice, it is common that teacher works also as advisor, similar to situations where a researcher acts as a trainer. As a rule, more than half of all farmers or enterprises do not see the need for cooperation with a research institution. The main obstacle for cooperation with research is the lack of resources, i.e. the lack of time, staff and money. Also the lack of suitable specialists in the specific field in Estonia and the lack of corresponding competence, the lack of resources for longer cooperation and the fear of information leakage<sup>58</sup>.

Regarding the cooperation - it is important to continue the activities of innovation clusters, knowledge transfer programs and research and development centers established in the period 2013-2020. Innovation cooperation and knowledge development need longer-term stability. It is important that the state commission longer-term horizontal and vertical (ie sectoral) research.

During the web-survey, the organisations and advisors were asked to evaluate the cooperation of different entities regarding the advisory services (Figure 17). The highest rating in average was given to public authorities, as everybody interested on legislation and support possibilities. The lowest ratings were given to the EIP operational groups and EU projects, as their activities and results are not published well or often enough (NSU has taken some actions, but there is still a lot to improve). The ratings are subjective, according to the respondent personal connections.

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<sup>58</sup> Agricultural Research Centre, 2019. Study on knowledge transfer



**Figure 17.** Degree of cooperation

According to a RDP SWOT analysis, one of the weaknesses of the Estonian agricultural sector is limited cooperation and coordination in knowledge exchange between scientists, trainers, advisors and producers. So, in designing the RDP measures there was an intention to tackle this problem and create qualitative change in co-operation between the producer, the processor, the adviser and the researcher. There is criticism with the fact that FAS is not related to producers' organisation(s) and is coordinated by a state founded organisation. The RDP knowledge transfer programmes are successfully implemented and are a good example of effective implementation of knowledge exchange measures which are also having a positive effect on cooperation between different stakeholders.

According to the interviews, representatives of the MRA are in general satisfied with the existing AKIS, but also identify items for improvement. Estonia is a relatively small country where people who are involved in different AKIS parts generally know each other. However, not every farmer knows where to start seeking advice and not everybody can afford to pay for special

knowledge/research/advice. At the same time, many activities are supported by the RDP, and these are mostly affordable or free of charge. Academic education in Estonia is mostly free of charge as well.

The improvement of digital solutions is needed, to make them more convenient for end users. Knowledge transfer flows and formats should be differentiated according to the needs of the end-users. There may be a need for very basic information (which can be provided through on-line materials) or for very specific individual problem solving (which can be provided by advisory service). One of the conclusions of the OECD study<sup>59</sup> is that, in addition to the limited economic capacity, the main problem of the Estonian agricultural innovation system is the lack of cooperation between private companies and research and development institutions. There is a need to further develop information systems, including market information (big data), as innovation becomes more complex and requires a lot of information.

On the positive side there are a lot of activities in knowledge transfer, where also the results of research are introduced; there is a supported advisory system (both the advisory service and training of advisers); and that a lot of reports of applied research are published online and are available to everybody. In addition, there are cooperation projects in the RDP, such as innovation clusters and knowledge transfer programmes where information exchange works both ways.

#### **4.6. Programming and planning of advisory work**

Efforts have been made to further develop the agricultural advisory system, including knowledge transfer, on several occasions. For example, the aim of the project PIKK (1999–2002) was to make information on agriculture and rural entrepreneurship more accessible: the concept of the advisory system coordination centre and the portal [www.pikk.ee](http://www.pikk.ee) were launched. The latest development plan of the Estonian agricultural and rural economy advisory system was for 2012–2020.

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<sup>59</sup> OECD (2018) Innovation, Agricultural Productivity and Sustainability in Estonia

Research, innovation and knowledge transfer have been singled out as one of the activities of the Development Plan for Agriculture and Fisheries until 2030<sup>60</sup> (expected to be approved in the beginning of 2021) prepared under the leadership of the MRA. The final report of the ex-ante evaluation of the development plan emphasizes both the need to implement a flexible model of the advisory system and the need to look at the innovation support system in an integrated way in terms of knowledge creation.

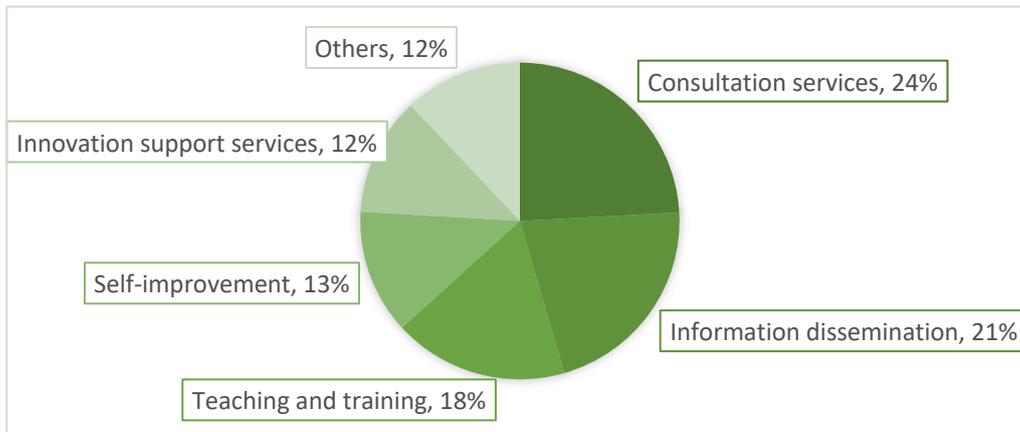
In the future period, the National CAP network support unit' activities will remain probably to the same unit, operating current national rural network. In addition, the MRA is thinking towards the AKIS coordinating unit<sup>61</sup>. The expectations from this unit is to evolve the tasks of advisory services and training and recruitment of new advisers. The unit aims also to integrate the innovation support services, enhance cooperation in knowledge transfer, innovation and promotion of cooperation in many levels.

According to the web-survey, less than half of the responded organisations (44%) have a staff development plan. This includes scale of training subjects (or agreement how much an employee can participate in paid trainings (for the one-month salary per year and during work-time). The plan can describe wide scale of training subjects incl. specialization related (plant protection, occupational safety, risk management etc.), methodological and general development. Trainings are usually outsourced to universities or professional trainers, some are organized by organisations themselves; internal training is not very common form. There is no clear pattern, how many days in a year an advisor receives training (from 2-15 days, many did not answer to that question - possibly because the advisors attend information activities as a part of their job to contact the clients, make a presentation or for collaboration with other organisations). Only few organisations can reward good performance or skill development.

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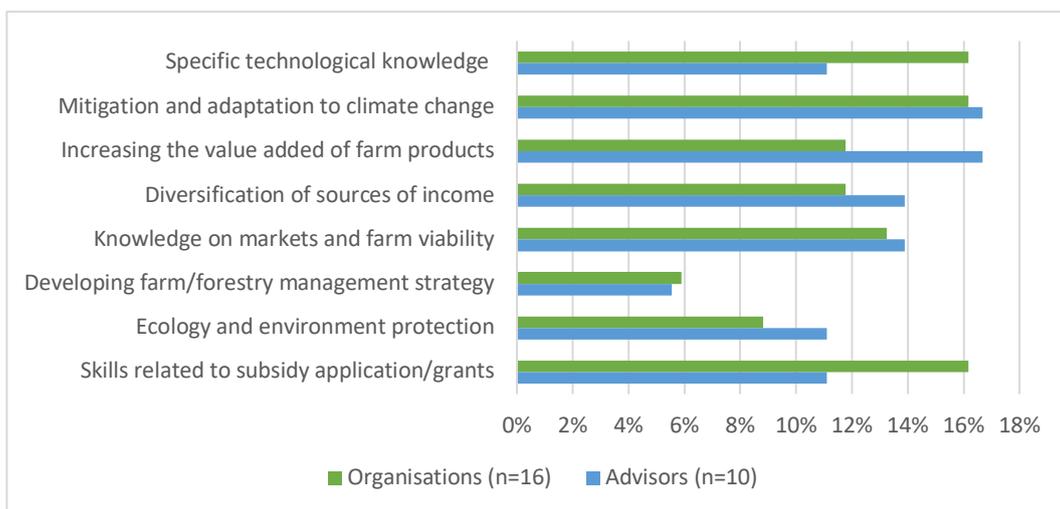
<sup>60</sup> <https://www.agri.ee/et/eesmargid-tegevused/arengukavad-ja-strateegiad>

<sup>61</sup> <https://www.agri.ee/et/eesmargid-tegevused/upp-strateegiakava-2021-2027/ettevalmistus>



**Figure 18.** Average proportion of advisors worktime in organisations

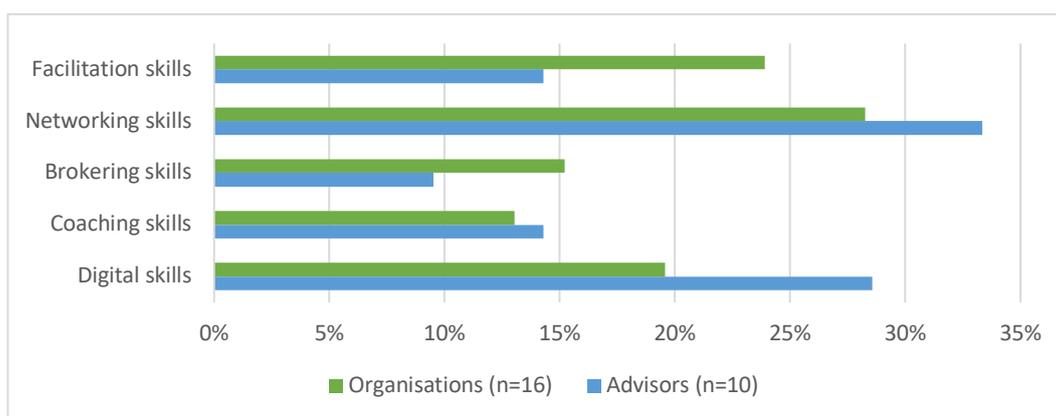
As average (Figure 18), 39% of advisors worktime goes to teaching, training and information dissemination, 36% of time is occupied with consultation and innovation support services. There was no consistency of answers about time allocation, as the advisors in the organisations have other responsibilities besides the knowledge exchange. Only three respondents pointed out the time allocation to other activities (project management in case of LAG; processing applications in case of Paying Agency; sharing experiences within the organisation in case of an input trader).



**Figure 19.** Technical skills and knowledge

Regarding the knowledge gaps or training needs to meet the challenges of CAP, the responses to survey showed the different understanding of organisations and

freelance advisors (Figures 19 and 20). The freelance advisors seem to need knowledge (more than advisors related to organisations) about the diversification of sources of income, increasing the value added of farm products as well on ecology and environment protection. The organisations advisors need their knowledge base elaborated (more than freelance advisors) in the fields of specific technologies and subsidy applications/ grants. The development of farm/forest strategy does not appear to be a big issue for either the groups.



**Figure 20.** Methodological and communication skills

The advisors feel the lack of digital and networking skills, while organisations assume the need to develop facilitation and brokering skills. This difference can be the result of the definition of the terms (brokering / facilitation) by different persons regarding their background. Advisors point out the need to learn the possibilities to increase the value added of farm products.

## 4.7. Advisory organisations forming the AKIS and evaluation of their AKIS implementation

Several studies have shown, that the Estonian producers' satisfaction with advisory services is high<sup>62</sup> - 96% of foresters, 98% of farmers and 87% of food processing companies who used advisory services were either definitely or rather satisfied with the quality of the advice received. Participants in knowledge transfer

<sup>62</sup> Private Forestry Centre (2019), Agricultural Research Centre (2019), University of Tallinn (2018)

events value the practical occasions - implementation of study circles, farm visits and demonstration activities.

There is a need for a central organization dedicated to disseminating knowledge<sup>63</sup>. Organizations involved in the dissemination of knowledge mostly wait for the instructions of the MRA on which activities will be supported, and will set their activities accordingly. The members of the organizations do not feel responsible for the common system, although they are parties to it. Lack of cooperation may be due to lack of time.

The concept of EU-FAS (cross compliance requirements related to CAP area-based supports and the obligation for advisory organisations to provide related farm advisory services) is clear to only limited number organisations. Four of 16 respondents (25%) confirmed, either that the advice regarding cross-compliance requirements by EU-FAS is embedded into their service list or that this is their separate topic.

Within the framework of the RDP 2014–2020, several measures encourage the dissemination and acquisition of knowledge. Training or education institutions and non-profit organizations that continuously organize training activities mainly provide the content and scope of the implemented projects. The experts noted the need to extend the target group from farmers (foresters, fishers) to wider public, including consumers. The trainings for advisors should also be accessible to researchers, lecturers of trainings or other entrepreneurs.

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<sup>63</sup> Agricultural Research Centre (2019). Study on knowledge transfer

## 5. Summary and conclusions

Large scale of different components of Estonian AKIS are available, the opinion of weak AKIS is not correct. They advisors provide services and information to farmers, foresters and other interested parties. Estonia is a relatively small country where people who are involved in different AKIS parts generally know each other.

The advisory services in Estonia could be described as a mixed system of supported and private advice providers. Research and education actors include the universities, several research institutes and vocational schools. There are several farmers' representation organisations and farmer based organisations and cooperatives in Estonia providing information and advice to their members. The input sellers and private media companies are important part of knowledge transfer.

Several RDP measures have been designed (and successfully implemented) to support the cooperation between the actors. Training and farm advisory services are provided in Estonia by publicly supported advisors and a number of independent organisations.

The main points of concern were raised during this study:

- **Advisors are ageing** and the younger generation is not interested to become a certified advisor. There is an expectation to have **joint actions** with all the persons, who do some kind of advising or innovation support services;
- **Insufficient funding for agricultural or rural research** is leading a lack of new domestic knowledge for transfer; several stakeholders have an opinion that scientific information is not available for producers in easily readable and understandable form;
- A need for AKIS operating body.

### 5.1. Summary and conclusions on sections 1 – 3

The main challenges for the provision of infrastructure and services in Estonia are the high concentration of the population in main urban centres, and its low density in most rural areas. Agriculture is one of the most traditional industries in the Estonian economy, it plays an important role, supplying food to residents and for

export and providing employment. Estonia is one of the most forested countries in the world: forests cover nearly half of the mainland. Estonia has good preconditions for the production of fishery and aquaculture products (Baltic Sea and inland water).

Estonian AKIS benefits from the small size of the country. Key persons in different institutions forming AKIS know each other well and cooperate in different forms and topics. Agricultural advisory service have been reformed more than 10 times, but funding flows have remained relatively the same. The financing period 2013-2020 have introduced some consolidation activities.

The EU funding programs have created several possibilities for AKIS. The linkages and cooperation need constant and further collaboration and the earlier conclusion of weak AKIS is not correct. The system operating in Estonia has all the components of well-functioning AKIS. Cooperation requires consistent action towards common goals. The key issue in disseminating information in Estonia is people, their commitment and knowledge. Constant communication between groups and increasing trust are crucial for the viability of the system. Regular meetings, wide-ranging information on activities and the dissemination of good practice contribute to the co-operation of the parties. The organization of AKIS requires consistency, there is no perfectly functioning system.

Estonia performs well on digital public services, but while both the broadband coverage of rural areas and the level of digital skills is higher than the EU average, gaps still exist between urban and rural areas.

## **5.2. Summary and conclusions on sections 4**

In most cases, the organization of the dissemination of information is described through institutions or support measures. The advisory services in Estonia could be described as a „mixed” system of supported and private advice providers. Farmer is free to choose whether he/she prefers supported advice from the certified FAS advisor or pays the full price to buy the service from the market (that is unregulated).

According to the i2connect web-survey, the main client groups for the organisations, providing advice are farmers with small/ medium-scaled farms and

Small and Medium enterprises. The number of clients per freelance advisor varies depending on the time allocation. The full-time advisors have 30-70 clients for average year; part-time advisors have 6-15 clients. The individual advice is provided mainly on the farm or via telephone. Group advice is organised as information days or trainings in a classroom or via demonstrations on the spot (in a farm or experimental centre). The supported advice is based on advisors with verified competencies and that the profession is awarded in accordance with the principles of the European Qualifications Framework.

There are a sufficient number of active professional advisors in Estonia, who cover the activities of forestry, agriculture and rural economy. The AKIS of forestry is supported by advice from owners' associations and private advisors; nevertheless, the state remains involved by accrediting and financing the advisors. Almost all of the current professional agricultural advisors work under Rural Development Foundation (RDF), providing the supported services. Older advisers (aged 50+) make up a significant part of the advisory system and many advisors have other duties (e.g. teaching or book-keeping services). There is unfortunately no professional advisors of the field of fisheries and aquaculture.

The respondents of the survey show high dependence on grants: EU CAP projects, national or regional projects and EMFF. Estonia has actively implemented and gained very good experience in using knowledge transfer support for trainings (incl. In-service trainings, information days, conferences, presentation days, etc.). There are enough trainings organized. The knowledge exchange in the field of forestry is mainly organised through forestry associations/cooperatives, in some cases the actions are supported through RDP, projects or state budget

Entrepreneurs' satisfaction with advisory services is high, including 96% of foresters, 98% of farmers and 87% of food processors. Changes in the conditions of advisory support have significantly affected the use of advice, the functioning of the system and its reputation. In the period 2014–2020, advisory support is limited to newcomers, fishers and aquaculture entrepreneurs, rural food producers and communities, producer groups and innovation projects.

In addition to supported activities, there are several specialists and organisations, providing information and advice to entrepreneurs. Most of the agricultural production produced in Estonia is produced by large enterprises and many have their own specialists. The companies involved in selling agricultural inputs and/or

buying production provide a lot of advice - they have financial resources to employ good specialists. In addition, some private advisors prefer to work independently and offer their service market-based.

There are many educational and research institutions in Estonia that deal with the bioeconomy. During the web-survey, the organisations and advisors were asked to evaluate the cooperation of different entities regarding the advisory services. The highest rating in average was given to public authorities. The lowest ratings regarding the level of cooperation were given to the EIP operational groups and EU projects, as their activities and results are not published well or often enough. The research institutions role of adding value to the advisory service and training can be elaborated. In order to ensure better cooperation between companies, it is necessary to continue information dissemination, training and advisory activities in fisheries, forestry and agriculture. More attention should be given to food processing advice and innovation support services.

On the **positive** side there are a lot of activities in knowledge transfer, where also the results of research are introduced; there is a supported advisory system (both the advisory service and training of advisers); and that a lot of reports of applied research are published online and are available to everybody. In addition, there are cooperation projects in the RDP, such as innovation clusters and knowledge transfer programmes where information exchange works both ways.

As average, 39% of advisors worktime goes to teaching, training and information dissemination, 36% of time is occupied with consultation and innovation support services – the individual work with the client is as much important as the group and mass media methods together.

The aging of the workforce, the shortage of professionals and skilled labor and the low attractiveness of the agriculture or fisheries sector for young people call for a holistic approach: **creating a positive image of the sector**, more effective cooperation between research and education institutions, businesses and providing advice. It is important to help those involved in the sector to better adapt to changes in society (eg the development of digital skills, a higher value-added orientation in the value chain) and to enable workers and entrants in the sector to respond flexibly to change.

## 6. Acknowledgement of partners, information sources and gaps

The author's great thanks goes to the representative of rural advisory services within Rural Development Foundation – Leho Verk, for support and critical review.

For this report, three special interviews were conducted:

- regarding agricultural side of AKIS with the 3 representatives of Research and Development department of Ministry of Rural Affairs – Helena Pärenson, Lehti Veeväli, Gret-Kristel Mällo;
- regarding forestry side of AKIS with the forestry advisor, representative of Estonian Private Forestry Centre and representative forestry group in Estonian Chamber of Agriculture and Commerce – Ülle Läll;
- regarding fisheries and aquaculture with representative of department of fisheries of Ministry of Rural Affairs – Eve Külmallik.

In addition, insights from other interviews, conducted by the author during other studies regarding AKIS in Estonia were used:

- 17 personal interviews and 4 focus groups regarding study on knowledge transfer relating agricultural and food processing enterprises<sup>64</sup>;
- 3 interviews with advisors (1 in the field of agricultural economics with the connection to innovation cluster – Triin Luksepp, 1 forestry advisor – Aira Toss; and 1 agronomist of private cooperative – Tiiu Annuk) for the study conducted for the H2020 project EUREKA – European Knowledge repository for best agricultural practices ([www.h2020eureka.eu](http://www.h2020eureka.eu)).

Thank you, for the contribution to the web-survey: Alar Lugu, Barbi Maramaa, Eha Metsallik, Jaanika Kaljuvee, Jüri Mets, Kaja Karlson, Kalle Kits, Kerli Ats, Kristina Märs, Leho Verk, Liisi Veske, Meelis Annus, Meelis Müil, Priit Põldma, Roosi Soosaar, Siiri Otsmann, Targo Pikk mets, Tiit Seer, Toomas Armulik, Ulvi Moor, Urmet Hiiekivi and others.

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<sup>64</sup> Agricultural Research Centre (2019) <https://pmk.agri.ee/et/maamajandus/uuringud/teadmussiirde-uuring>

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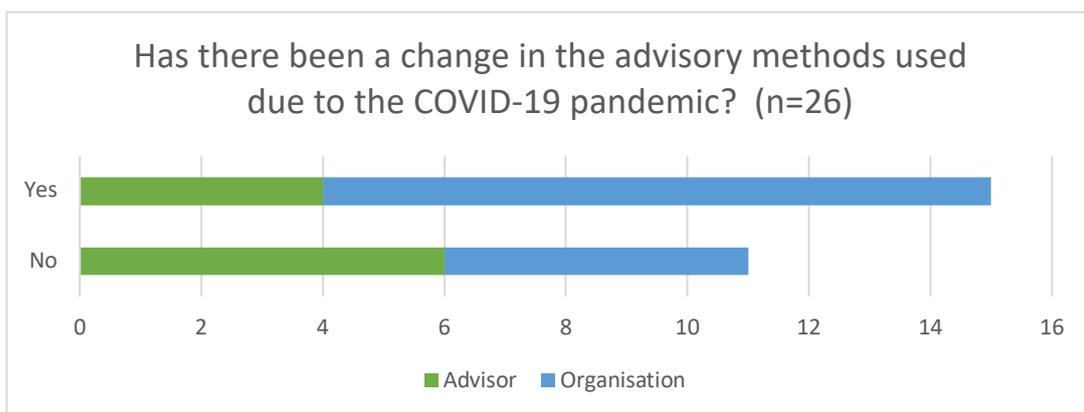
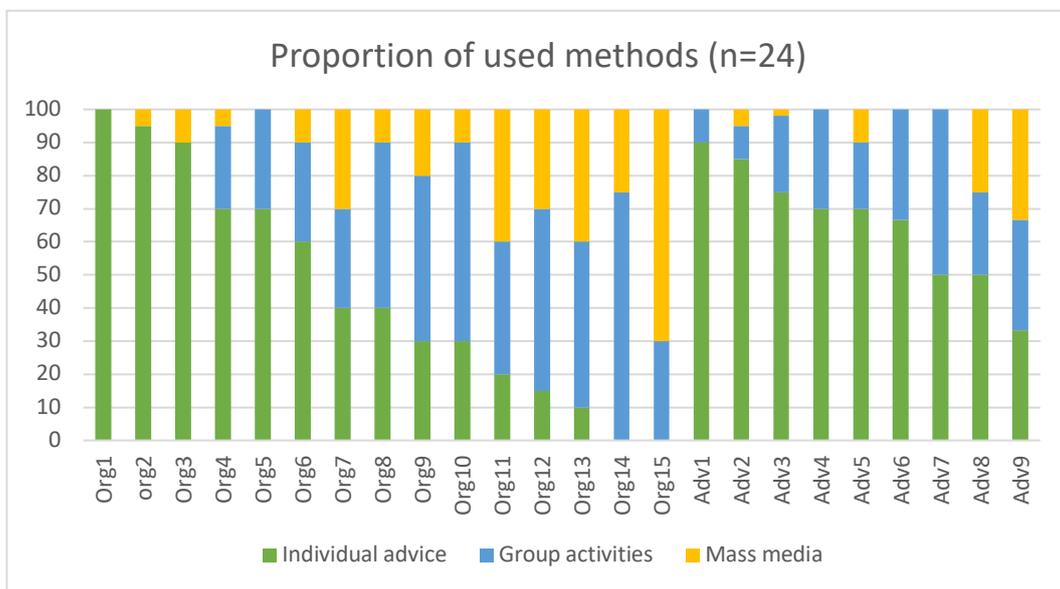
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## Appendices

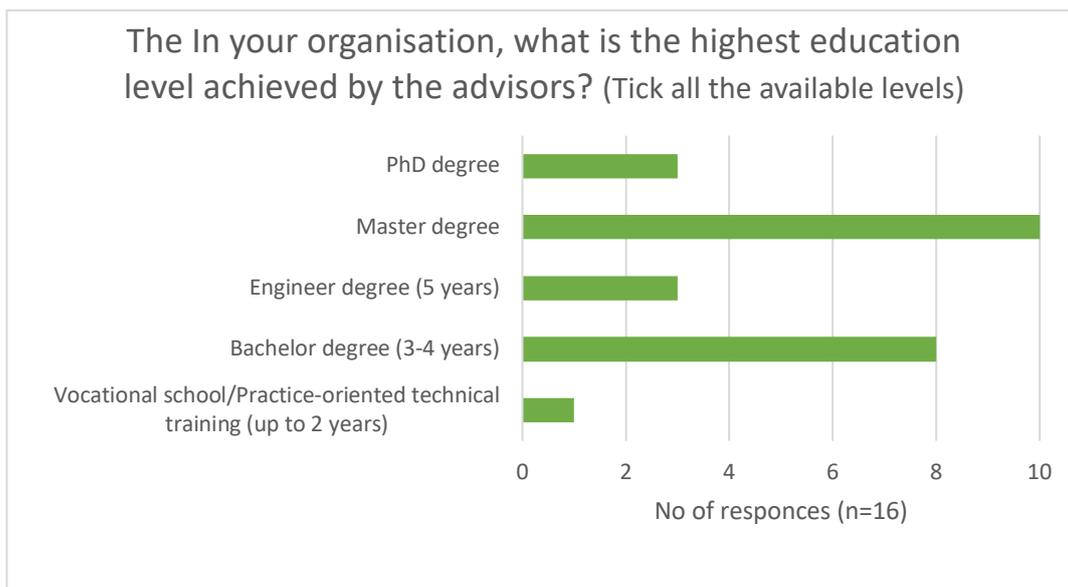
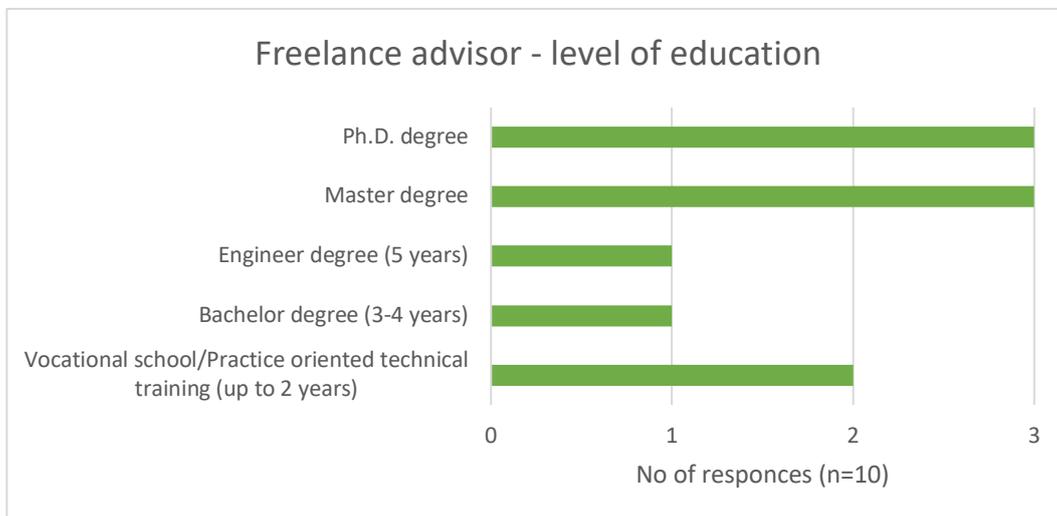
### Annex 1. Additional data from web-survey

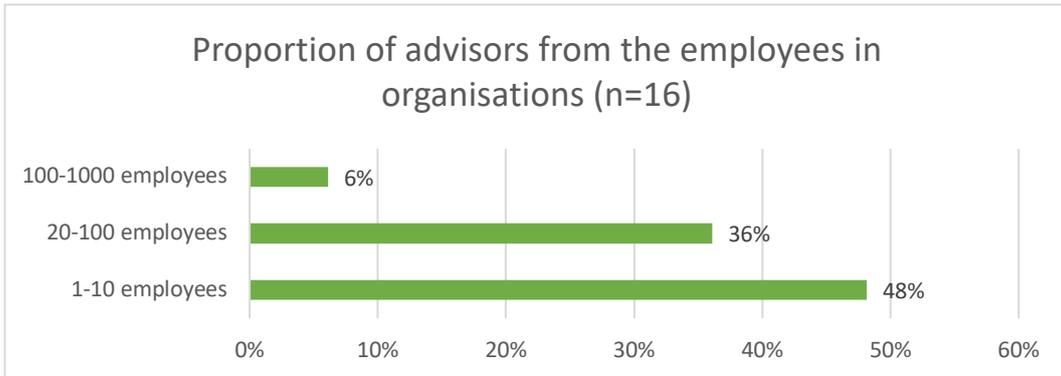
#### METHODS OF ADVISORY WORK

There's no clear picture on the preferred advisory methods. All depends on the profile of the overall organisation.



**HUMAN RESOURCES**





There was not enough answers to make conclusions regarding the number of advisors for each education level.

Years of professional experience, of the total number of advisors	Number of advisors	Percentage
0-3 years	7	4.3%
3-10 years	89	55.3%
More than 10 years	64	39.8%
Total number of advisors	<b>161</b>	



# **AKIS and advisory services in *Finland***

## **Report for the AKIS inventory (Task 1.2) of the i2connect project**

***Date: December, 2020***

**Authors:**

Jaana Kiljunen

Danuta Jaakkola

Contact: [jaana.kiljunen@proagria.fi](mailto:jaana.kiljunen@proagria.fi)

Project funded under the Horizon 2020 Research and Innovation Programme under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION' HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

The need for agricultural and rural advisory services varies across Finnish farms. Farmers and farms differ a lot in type of business, size, part of a lifecycle, strategies, economics etc. The climate is very different in the north part of Finland compared to the south coast. The number of farms is decreasing and the average size is increasing. There will need for more laborer in individual farms in the future, today most of work is done by the owners. At the same time there is a trend to replace humans with new technology because of high laborer costs. For example today more than 1/3 of Finnish milk is milked in automatic milking system barns .

Low agricultural income and poor economics for farmers has been a big problem in last years. Specially the Finnish dairy business was and still is suffering lot of Russian ban, when profitable and large scale fresh dairy product export was stopped in one night.

Subsidies and regulation systems seems to get more complicated. Public voice and social media is blaming the whole agricultural on climate change and brings up new demands on farming systems and animal welfare. This all stresses farmers a lot and the well-being of the farmer needs to be taken care of more intensive.

The role of the farmer is changing into the role of entrepreneur rather than the classic farmer as a way of living. The developing farm looks more and more like any business, with a strategy, vision, mission, budgets and action plan for short and long time period. The transition is very fast and farmers need more knowledge in economics and leadership.

Demands for advising is changing as well. Future farmers are more educated and need more specialized advice. The role of an advisor is looking more like a business coach, working as a consultant using new methods in an interactive way. There must be more digitalization and automatization in “back-office” services to save the human time and costs for that type of work that cannot be done with machines so far.



AKIS actors should co-operate more to improve profitability, competitiveness, management and environmental awareness of the future farms. Specially we need more efficiency to disseminate the research results to practice.

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Thank you very much for all AKIS operators in Finland. It was very easy to get information from all activities as well as the history from all operators web-pages.

## 1. Main structural characteristics of the agricultural and forestry sector

The majority of the fields and farms in Finland lie between the 60th and 65th parallel making Finland the only country in the world with a significant agricultural sector so far in the north. Agriculture in Finland is characterized by the northern climate and self-sufficiency in most major agricultural products. Primary production economic role is declining in terms of GNP. Agricultural, forestry and fishery covered 2,7% of GDP in 2019. Employment in primary production included the food industry and forestry is although a significant part of the Finnish economy. The population of Finland is 5,525 M people (1.1.2020). Agriculture employed 70 000 and forestry 26 000 people in 2019.

The average temperature of the whole year varies in Finland between +5°C in the south and -2°C in the cold areas. The growing season starts in April-May and ends in August-October. On the southwestern coast, the growing season can exceed 185 days, but in northernmost Lapland it is less than 105 days. July is the warmest month, and January-February the coldest.

The surface area of Finland is 338 419 m<sup>2</sup>. Of the total land area 78% is covered by forest and 6.7% by agricultural land.

In land use grain production is the largest sector, next comes production of other crops and grassland, cereals total 1,1 M ha, grass 0,8 M ha. Oat quality is exceptional good thanks to long days and Finland is the biggest oat exporter in European Union. 13,6% of arable land is used for organic farming.

Dairy farming is the largest agricultural sector in terms of turnover. In dairy the number of farms is decreasing 7% per year, but the number of cows is decreasing much less. In 2019 there were 260 000 dairy cows in Finland. Genetic gain compensates the decreasing number of cows, at the same time dairy farms are getting bigger. Milk production is quite stable between years. Number of dairy farms increases towards the north and east. Thanks to long summer days the grass is growing well, which gives good possibilities to ruminant based animal production in northern parts of the country as well. Although the growing season

is usually too short for grain in the north. There is practically no corn in Finland either, so dairy cows main feed is grass silage and the protein source is rape seed (soy bean is forbidden in dairy industry quality schemes).

The agricultural sales revenue total was EUR 2.2 billion, of which milk accounts for 40 %. Finland is self sufficient on dairy products, although half of the cheeses are important. This means, that dairy co-operative Valio (80% all milk in Finland) is exporting dairy products quite much. Before Russian ban fresh dairy products were exported to Russia with a good profit, today the export is in cheese and milk powder and focused mainly to EU, USA and China. Economical value of the export as well as dairy farmer's income dropped after Russian ban.

There are 47 000 farms in Finland, most of them are private owned (86%) and heirs (11%), number of farms has decreased appr. 2,5% since 1980's, although the production has been quite stable. Farmers average age is 49,1 years and an average farm has has 47 ha field. Almost every farm has forest as well.

Finland has been quite isolated from farm animal imports last decades. This has given us very good situation in animal health. We are free from serious animal deceases as well as free from salmonella. Antibiotics are used only to sick animals under vet control. It is forbidden to cut piglets tails or hens' and broilers' beaks according to animal welfare act.

Finnish farmers are very keen on operating with environmental subsidies, almost 90 % of Finnish farms belong to an official agri-environmental program.

Private persons with their families own 74% of Finland's total forest land area. These property entities had an average size of 30.5 hectares and 620 000 forest owners. Increasing trend is jointly owned forests (siblings, family etc.). The rest of the forests are owned by the state, wood industry, 3<sup>rd</sup> sector or churches.

## 2. Characteristics of AKIS

### 2.2. AKIS description

The Ministry of Agriculture and Forestry steers the policy on sustainable use of natural resources. Legislative work is carried out as part of the Finnish Government and the EU institutions and decision-making.

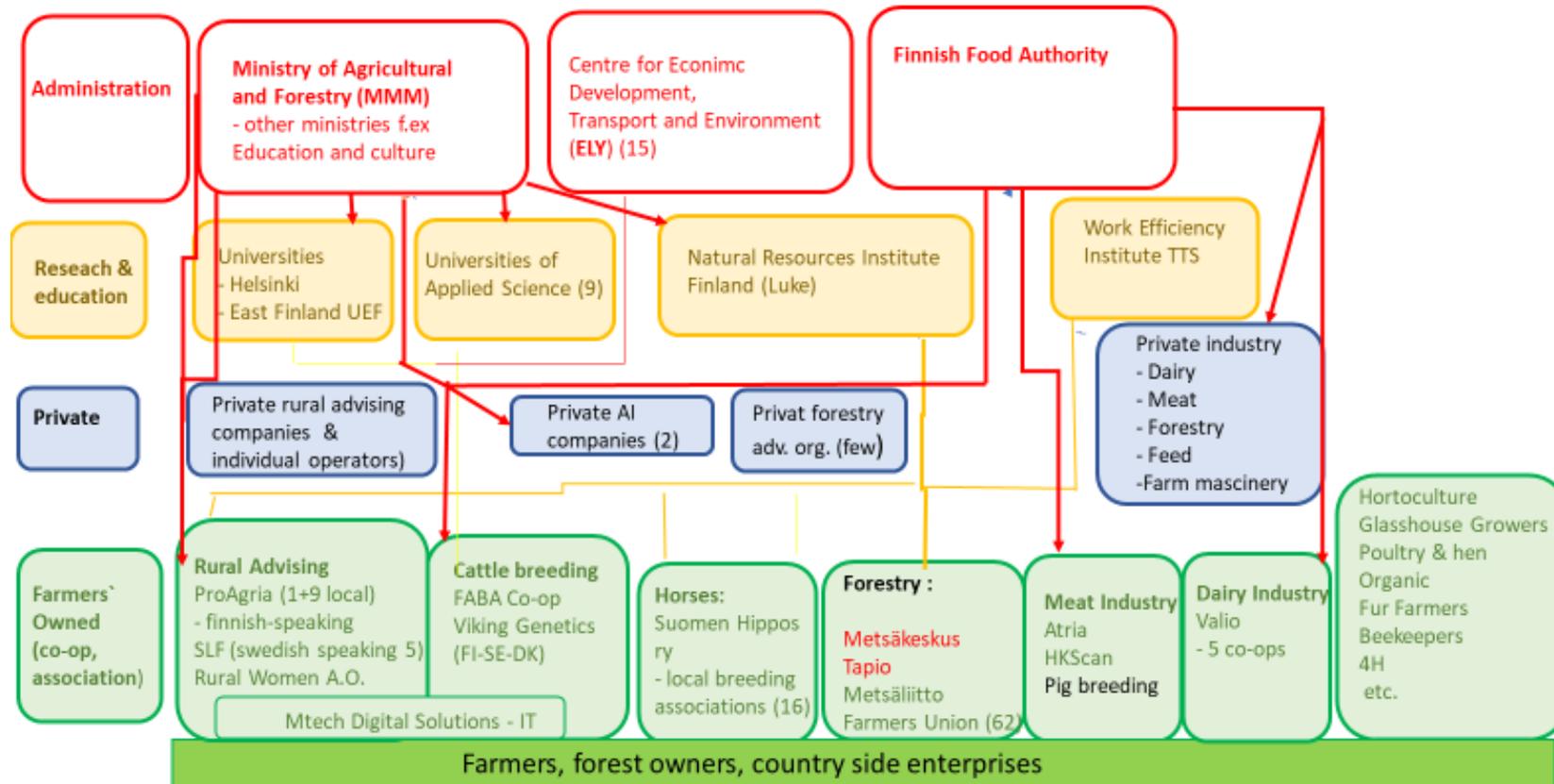
The Finnish Food Authority operates under the Ministry of Agriculture and Forestry for the good of humans, animals and plants, supports the vitality of the agricultural sector, and develops and maintains information systems.

The Finnish Food Authority began its operations on 1 January 2019 when the Finnish Food Safety Authority, the Agency for Rural Affairs and part of the IT services of the National Land Survey of Finland were merged into one Authority. The Finnish Food Authority's activities cover the entirety of Finland, and the Authority employs almost one thousand experts and professionals in nearly 20 locations.

The Finnish Food Authority promotes, monitors and studies the safety and quality of food; the health and wellbeing of animals; plant health; fertilizer products, animal feeds and plant protection products that are used in agricultural and forestry production; and propagating materials i.e. seeds and planting materials. It is responsible for the use of the funds provided by the European Union's agricultural guarantee and rural development funds in Finland, operates as the EU's paying agency and monitors the implementation of EU and national grants – farming subsidies, project, entrepreneurship and structural subsidies as well as market subsidies.

In this report most of the descriptions of Finnish farm advising system is covered with ProAgria example, because it is the main operator in this area, serving more than 80% of all Finnish farms and rural businesses.

### AKIS FINLAND 2020



## 3. History of the advisory system

### 3.1. Agricultural advising

The history of the agricultural advisory system began in 1797 when the first “Economic Association of Finland” was established. The first agricultural advice themes were inter alia potato farming, hay and flax cultivation and farming tools. The Economic Association operated in the whole country, but at the same time special regional advising bodies were needed.

During the years 1828-1905 many regional agricultural and economical associations were established. In 1907 the representative meetings of the regional centers were replaced by the Central Association of Farming Advising Centres (MSKL) which was set up to control and lead the regional centres.

In 1930’s the Rural Women's Advisory Organization was founded. The Advisory organization is now a nationwide organization for advice directed at households and customers, promotion of landscape management and small enterprises in rural areas.

In the year 1993 there was a clear segmentation between the Association of Rural Advising Centres and nationwide Rural Advising centres. Positive changes in the agricultural advising strategies were noticed after Finland joined the European Union in 1995.

ProAgria, the new name of agricultural advising organization was established in 2001 with an idea of deepening co-operation between advising and animal breeding. Next organizational change was done in 2013, from 16 regional centres to 11 and the last one in 2019 to 9 local organizations. Today the independent local ProAgria organizations are responsible for the farm advising work in their area and the central organization is focused on supporting the knowledge, marketing, IT, information and R&D work in co-operation with the local organisations and stakeholders.

Cattle breeding started in 1898 when the East-Finland Cattle Breeding Organization was founded for breeding east type cattle breed. 1901 was founded Finnish Ayrshire Association (for Ayrshire breed breeding) after first Ayrshire

animals were imported into Finland in 1848 from England and later on North-Finland Cattle Breeding Association 1904 (for north type cattle breed), West-Finland Cattle Breeding Association 1905 (for west type cattle breed), and Finnish Pig Breeding Association in 1908. All original breed associations joined in 1946 as Finland Cattle Breeding Association and in 1969 together with Ayrshire and pig breeders to Finnish Animal Breeding Association. In 1969 founded Finnish Beef Cattle Association joined it few years later.

AI Associations Union and Finnish Animal Breeding Association changed their structure up to co-operatives. At the same time was build an umbrella organization to AI co-ops and breeding organization FABA.

Moving on towards genomic selection raised a need of stronger organization and co-operation between same type of breeding schemes. Finland has been breeding for health traits since 1983, so natural partners were found in Nordic countries with the same breeding schemes. All local AI co-operatives joined with the breeding organization and new co-operative was called Faba. Common evaluation company NAV was founded with Sweden and Denmark, bovine semen production concentrated into Viking Genetics, as well owned by these three countries. Boar semen production and pig breeding was operated by Faba Sika Oy, later on sold to Snellman meat industry. Today these new organizations are running well and international co-operation is becoming more and more important.

Horse breeding started in 1907, when the herd book for Finnhorse was founded. The aim was to improve a working horse breed for agricultural and forestry needs, few decades later started systematic breeding for trotting horses. Finnish Warm Blood breeding for riding horses started in 1926. The number of horses was biggest in 1950 with 408 000 horses. Today there are 74 300 horses, 19 200 multi-purpose Finnhorses, 25 000 warm blooded trotters, 19 700 warm blooded riding horses and 10 400 ponies. Horse breeding and trotting business is today operated by Hippos and it's local horse breeding associations.

## 3.2. Forestry advising

Finnish Forest Association was established in 1870 at the strong national awakening theme and economical improvement times. Association collected forest professionals who saw burning forest for agriculture purposes and cutting down for building material as a threat for wood industry. The association started to promote the national importance of wood industry. They started to improve the knowledge of silviculture as well. They for example hired a specialist teaching seeding, planting, built up a tree nursery system, took part in agricultural shows and rewarded good wood producers.

In 1907 all private forest owners advising work was transformed into Tapio, which is today the leading provider of forest management related advisory and consulting services in Finland, serving both the private and public sectors. Tapio is 100% owned by the Finnish Government. The Finnish Forest Association concentrated to work on forest information. Today the association is known as a co-operation organization among forest and wood professional association and publishes information in English as well in web-paper forest.fi.

The destruction of forests was prohibited in Finland by the very first Forest Act in 1886. Currently this prohibition means that after cutting downs the forest owner must within a due time ensure that a new forest is established to replace the one felled. The strong legislation has been a back bone for wood industry raw material as well as increasing the forests growing capacity.

The method of setting up a new forest depends on the type of habitat. In general, seedlings are planted on productive land, since they are capable of competing for space with grasses. On poor, grassless lands, seeds may be sown. These two methods of establishing a forest are called artificial regeneration.

A forest may also be established through natural regeneration. This means that a sufficient number of large and healthy trees are retained to provide seeds for a new stand. In continuous-cover silviculture, the standing trees provide seeds for the new trees for the small clearings.

The average annual felling area in Finland is a generous two percent of the forest area. About two thirds of this consists of thinnings while the rest is made of regeneration.

The aim of silviculture is to maximize the yield of most valuable roundwood in the forest. To qualify as roundwood, a tree has to be sufficiently straight and stout, which is why roundwood is harvested particularly in the end of the rotation period. Roundwood is processed by sawmills into plywood, planks and boards. These are used to make furniture or houses, for example.

Thinner trees are called pulpwood, which is harvested particularly in thinnings. Pulpwood and chips, which are a by-product of sawmills, are sent to pulp mills because they are very good material for paper and cardboard. The sawdust produced by sawmills is used either in board manufacturing or for the generation of energy.

Harvesting also produces residues – the crowns, branches, twigs and stumps of trees. An increasing proportion of this is gathered in to provide a source of energy for power plants.

Today in public debate on forestry issues is focusing in two harvesting methods, either clearcutting or continuous-cover – or uneven-aged – harvesting. The interests of forest owners and environment activists differ most when talking about old forests. The need of old forest protection is obvious, it is mainly question of hectares and money. Finland is covered with forests and most Finns feel home in the forest, hunting, hiking, picking berries and mushrooms regularly. Every man's right gives good opportunities for everyone to enjoy forests and because there are forests everywhere, everyone can visit a forest by foot wherever they live.

## 4. The agricultural and forestry advisory services

### 4.1. Overview of all service suppliers

The biggest rural advisory organization in Finland is ProAgria. ProAgria advisory services cover the whole country and most of the services needed in farms, horticultural and rural businesses. There are few other operators selling services mainly on farm economics and book-keeping with a small market share (like Wikli Group) locally and a big group of single private advisors (>100), mainly specialized on vet services or economics and operating locally.

Most of the veterinarians are working in public services or employed by private vet-service company or operating as individual private vets.

Breeding services are organized by FABA co-operative with appr. 7500 members. FABA is operating all over Finland with 350 specialists, serving dairy and beef farmers in AI, embryo transfer, classification, breeding planning, gene recourse work with rare original breeds etc. FABA has an EU breeding organization status, keeps up all bovine herd books in Finland and runs all dairy and beef breeding schemes in practice. FABA includes a vet company (Emovet) as well. FABA turn over was 42 M € in 2018.

Nordic co-operation is very strong between Finland, Sweden and Denmark in cattle breeding. FABA is one of the owners of AI company Viking Genetics and Nordic Cattle Genetic Evaluation and operates with Viking Genetics breeding scheme. FABA is an active member of World Holstein Federation, World Ayrshire Federation and several other international breed association.

In AI business there are two private companies operating in Finland with much smaller turn over than FABA, they are selling Semex and Alta Genetics dairy bull semen and AI services.

Suomen Hippos ry, The Finnish trotting and breeding association, consists of 131 member organizations. One of its functions is to license trainers, drivers and officials. Hippos is also in charge of formulating the rules of racing, as well as to serve as the registry for the horses. The maintaining of breeding and racing information and records are also a part of Hippos responsibilities. The Finnish

trotting and breeding association seeks to promote the trotting sport and fair play in trotting games.

In equine advising Hevostietokeskus has a big role. It operates as a development unit on advising and education. It offers information on horse feeding, stable conditions, horse health, training etc. The other important operator in equine business in Finland is the Natural Research Institute Finland (Luke) horse research unit. ProAgria is serving horse farms in several ways like business development, strategy, construction of stables and riding halls, economics, plants, lean etc.

ProAgria has a cooperation agreement with several independent special agricultural organizations like the Finnish Poultry Association, Work Efficiency Institute (TTS), Central Organization for Finnish Horticulture, Association for Finnish Beef Farmers, Association of Organic Farming, Association for Trotting and Horse Breeding (Hippos) and the Finnish Fur Breeders' Association.

Finland food industry is very much based on co-operative and owned by Finnish farmers. Most of the operators in food sector are supporting their producers with variation of farm level services. Most popular are quality services like lab controls and education. Very typically co-ops help the farmers with strategy planning, investments and problem solving (i.e. quality problems). Usually food industry serves free of charge their owners.

Feed industry is operating quite much on advising services, mainly feeding planning with their products for free or included in the prize of the feed. Most of the device sellers are operating in some level of advising as far it concerns their own products.

Automatic milking system business is investing in advising quite a lot. The biggest milking robot sellers in Finland are Lely and DeLaval.

ProAgria is working closely with automatic systems, for example selling starting services for DeLaval. One third of the whole milk in Finland is milked by automatic milking systems, so there is a big need of AMS knowledge among dairy advisors in ProAgria.

Co-operation is good with feed industry as well, ProAgria feeding specialists use all kind of feed products and raw materials when making feeding plans for animals.

Feed companies are offering product details for ProAgraria IT-solutions to be used in this planning programmes.

Finland is a land of family forests, two-thirds of the Finnish forests are owned and managed by private individuals. Tapio is a leading provider of forest management related advisory and consulting services in Finland. They offer services both to the private and public sectors in Finland and are also active internationally. Tapio's main task in the start was the enforcement of forest legislation along with advisory and education services. Today Tapio provides consulting and expert services in the field of forest management and we are a 100% Finnish Government owned company.

Suomen metsäkeskus – The Finnish Forest Centre is a state-funded and operating under the guidance of Ministry of Agriculture and Forestry and organization promoting forestry and related livelihoods, advising landowners on how to care for and benefit from their forests and the ecosystems therein, collecting and sharing data related to Finland's forests and enforcing forestry legislation.

[Metsään.fi-eServices](#) portal connects owners with related third parties, including providers of forestry services. This makes it easy to be in touch with forestry professionals. Metsään.fi offers the latest information to forest owners on their properties. Users can see what should be done in their forests right now. Information is displayed for each forest stand compartment, broken down by soil type, tree type and natural occurrence, and possible logging or forestry actions are suggested, including income and cost estimates. Maps and aerial photographs clearly show where properties are located and what they look like. Users log in securely using their online banking codes. The service is offered in Finnish and Swedish.

Forestry businesses, forest management associations and timber buyers can be found in the portal. Forest owners can check which service providers are available in the area surrounding the forest property, and, if necessary, authorize chosen partners to view their data or transfer them to their own systems. It also contains up-to-date aerial photographs and maps. Most private Finnish forest owners are either in employment or retired, and a growing proportion live far from the forests they own. For most owners the forests are not a major source of income, and only a small fraction has professional forestry skills.

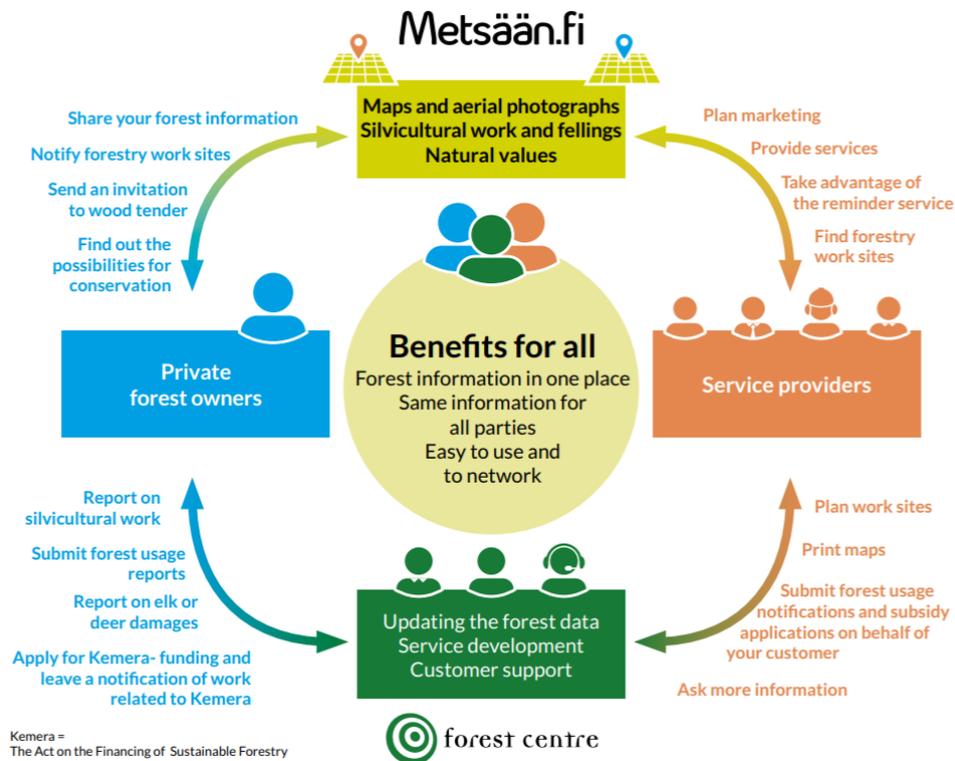


Figure 2, Forestry data services

Forest industry is serving customers at the timber point as well, the biggest operators are Stora Enso, UPM and co-operative Metsäliitto. On the forestry advisory market there are some private advisors as well.

The Central Union of Agricultural Producers and Forest Owners MTK aims to promote the economic viability of family forestry by having an influence on the forest and economic policy. The Forest Management Associations in MTK organization (66 of them all over Finland) serve forest owners in practical forestry issues and look after the interests of forest owners at the local level.

In appendix 1 there is a list of the main operators.

## 4.2. Public policy, funding schemes, financing mechanisms, advisory service providers

Public agricultural policy is mainly based on European Union Common Agricultural Policies added with national mechanisms since 1995 when Finland joined EU. Subsidies has a big role on farms, 31% of farm income comes from subsidies, total 5789 M € in 2019 (CAP 561 €, LFA 837 €) EU and national funding, 837 € and national 434 € (source Luke 2020). For the farmers it is urgent, that they get help with the formalities, timelines and details of the mechanism. ProAgria helps in bureaucracy and has an insurance system to cover advising work.

The state subsidies the forest management differs from the agricultural policy, the aim in forest sector is to safeguard the continuous growth and health of Finnish forests.

The advisory service structure in Finland is based on public-private partnerships. The state's share in terms of finance agricultural advising is decided by the Parliament of Finland, the money is appointed to the Ministry of Agriculture and Forestry (MMM). The advising operators (i.e. ProAgria, FABA and special advising organizations) discusses regularly with the Ministry of Agriculture and Forestry to fill in the national tasks and needs of rural advising. The basics and priorities are described in the partnership agreement. According to the annual agreement MMM has the right to coordinate the agricultural advisory services in that part of the business, which is paid by the ministry.

The annual agreement involves all agricultural advisory services in Finland which provides services countrywide. These advisory suppliers are the Association of ProAgria Centres and Swedish speaking Association of ProAgria Centres, FABA co-op, Hippos Ry (the Finnish trotting and breeding association), Suomen Siipikarjaliitto Ry (The Finland's Poultry Association), Suomen Turkiseläinten Kasvattajain Liitto Ry (Finnish Fur Breeders' Association), Työtehoseura Ry (Work Efficiency Institute) and Puutarhaliitto (The Central Organization of Finnish Horticulture) as the Special Advisory Organizations.

The leading agricultural advisory organization in Finland is ProAgria, services covering the whole country. ProAgria is a private organization owned by its

members, which are mostly farmers. Through this organizational structure the interests and the voice of the Finnish farmers and countryside entrepreneurs is strongly respected in service modelling. ProAgria is an independent expert organization providing an extensive network of specialists and a wide range of services to rural entrepreneurs.

ProAgria consist the central organization Association of ProAgria Centres and nine local independent ProAgria associations. All the R&D, support services, information, IT and most of the education of the advisors is done together. Big decisions are made in the board of directors, smaller in different business teams. Farm advising work is operated by the 9 local organizations. ProAgria sister organization is operating in Swedish, ProAgria Svenska Lantbrukssällskapens Förbund, co-operation is very close including common IT, expert education, R&D etc.

Rural Women's Advisory Organization is a nationwide expert organization and an extensive women's network in the rural areas. They include 1300 associations at municipal and village level offer a wide range of activities including training courses, excursions and club meetings for over 50 000 members. Rural Women's offer expert services, consulting, planning, advice and training employing 70 professionals in various fields of expertise, most of them are located in ProAgria local organizations and work very close with them.

Most of the advising organizations income is based on customer payments, some get a little part from the government. Pricing is depending on the type of service, usually per service or per hour, sometimes based on competitive bidding or whole offer after negotiations. Pricing is over all much lower than in other sectors business consulting. In ProAgria the finance is covered 67% of customers' payments, 15% R&D services and projects, 14% governmental and 4% other. Total turnover is annually appr. 50 M €. Pricing for the customers is reasonable thanks to small public economical support.

Co-operative food industry works very close with the advising organizations like ProAgria and FABA co-op. For example meat industry supplies slaughter data to the agricultural data bank for breeding purposes and dairy industry offers milk analyses for milk recording free of charge and Valio provides milk and feed analyses free for it's owners and different kind of management key performance indicators in co-operation with ProAgria..

### 4.3. Human resources and methods of service provision

Agricultural advisers are experts in rural business working in agricultural organizations and companies. The work includes counseling and training, as well as administrative and development tasks. Some agricultural advisers are themselves farmers. The profession requires deep knowledge of agricultural topics and regulations, as well as organizational and communication skills. Most of the advisors have a degree from agricultural college or university of applied science, supervisors and development specialists usually master-level university degree. There are not reliable statistics available of the total amount of specialist working on advising sector nor the experience or education. In 2011 the union of agrologists (Agrologiliitto) made a survey of their members work, at that moment 1/3 were working in advising business.

ProAgria has 650 experts serving the farmers and rural entrepreneurs. Educational backgrounds are agronomists, bachelors and masters of science. Substances cover several themes like economics, information technology, communication, education etc. Some of the advisors are working as farmers themselves as well.

Breeding organization FABIA co-op has 350 experts, AI technicians, breeding advisors, supervisors, biometric specialist and vets.

Forest advising organization Tapio has more than 70 professionals, most of them have silvicultural university education.

In the history of agricultural advising we have seen a strong development in advisory work. In early years the advisor cycled to the farm, collected data herself, told the farmers what to do in different issues in a teaching way, sometimes stayed overnight and after the visit saved data in the office, wrote reports etc. Today we use fluently digital solutions, new mathematical models and algorithms and are about to drown in information flow. Farmers are more educated, the future farmers usually have a university of applied science background. They speak languages, are capable to implement management systems abroad, used to self service in reports and data handling. At the same time the needs of expertise advising is deepening and the role has transformed from a teacher to a coach.

Advising today is interactive, focus more on economics and the whole farm, peering in small-groups, look at the fields with drones and right now - in Covid19 epidemic situation even meeting the farmers and peering groups with remote systems. Advisors are working in multi-substance teams to fulfill the more complex needs of the farmers.

In Finland we are worrying how do we get the best experts in the future to work in advising business. Agriculture as such is not nowadays the most sexy and well-paid business, there are critics in the media concerning the climate change and agricultural role in it. Future needs in advising business is becoming more complex, do we get the best brains to study agriculture in the universities and work for advisory business?

#### 4.4. Clients and topics

Most of the advising organizations sell services for any one working in rural businesses. Co-operative food industry advisors serve only their own members. ProAgria provides an extensive network of specialists and a wide range of services targeted to rural entrepreneurs. The entrepreneurs vary from farmers to small business owners who run businesses mainly in rural Finland. More than 80% of Finnish farms utilize ProAgria services.

The ProAgria advisory services are primarily based on face to face advice at the farm. This is changing. Nowadays digital services are increasing rapidly. ProAgria has an online advisor search to find a specialist or leave an order, national help phone is serving long days and the chat service has become very popular. CRM gives advisors opportunities to make bookings for other colleagues as well. The advisor charges the client for services, price is based on service, used time, advisor's professionalism level or a mix of these. Agreement based services like milk recording are charged according to the agreement. Dairy industry Valio's owner co-operatives offer their members a service, where the advising organizations (ProAgria, FABA) can charge some services direct from the dairy farmer's milk income.

The structure and needs of the customers vary a lot. ProAgria offers advising services farmers and entrepreneurs who work with dairy, crop, beef, pork, meat,

poultry, sheep and goats, horses, organic farming, horticultural, food and tourism, environmental services and other businesses. The main issues advisors are working on are strategy, leadership, business development, lean, production management, human resource management, investments, sales and marketing, changes in ownership and corporate types, all kind of economics, book-keeping, subsidies management, organic farming, animal welfare and so on. ProAgria offers as well a lot of education to the customers like long and short courses, books, pod casts, webinars, practical on field visits, peering teams, work well-being etc. There are as well official tests for license to use herbisides etc.

Recently there has been a need for acts against climate change like coal binding on the fields and carbon footprint calculations. The method of advising is transforming from single substance advising to consultative work.

Type of clients and farms vary a lot. ProAgria offers services for typical farmers but also for entrepreneurs working in the rural areas like tourism of food services. While services to entrepreneurs are based on strategy, leadership, decision making and goal-setting, concentrating and focusing on better results, recognizing new opportunities and exploiting them and controlling the whole business.

There are 650 experts in ProAgria serving the customers all over Finland meeting 28 177 customers every year (80% of them are farms), 85 000 live contacts per year, monthly 300 000 electronical contacts (increasing rapidly).

## 4.5. Linkages with other AKIS actors/knowledge flows

Finland is a small country and there is only one agricultural university, Helsinki University. Agricultural business is not very big, so it is quite easy to know each other both as organization and personal level, which helps a lot to build up co-operation. There is only one advisory and breeding data bank in agriculture, which is owned by ProAgria and FABAs, operated by MTech Digital Solutions.

MTech is owned by ProAgria, FABAs and the Farmers' and Forest Owners Union MTK. It's customers include companies, organizations and regulatory authorities

and r IT solutions are applicable to various industries. MTech has a long experience as the supplier of web services and ICT solutions to farmers, breeding organizations and agricultural advisory organizations. [The MyFarm software family](#) developed by us is the most popular agricultural software in Finland. They systematically expand our operations and offer a competitive alternative also for operators outside Finland, specially in other Nordic countries.

Databank includes all Finnish agricultural data and has a connection to the official bovine identification register. Data bank includes data on bovines and sheep, milk and meat production, farm economics etc. Horses and pigs are not included in production or register level, only on farm economics point of view if they are using ProAgria services. Co-operation between Nordic Breeding Evaluation and AI Viking Genetics is very close.

ProAgria co-operates with other actors in the field of AKIS, especially within the food chain, research institutes and universities as well as applied agricultural education institutes. ProAgria offers education for stakeholders as well as they offer their courses to ProAgria's advisors. Co-operation is very active with the Farmers' Union, banks, universities of applied science and co-operative food industry and different suppliers like automatic milking systems and feed industry.

ProMaatalous ("pro-agricultural") is a co-operation group, which includes ProAgria, FABA co-op, the Finnish biggest dairy industry Valio and IT-technology and services MTech Digital Solutions. Its bodies meet regular and agrees on common themes.

Co-operation with the forest advising sector is quite poor even though the highest university education is in the same university with agricultural and veterinarian (Helsinki) and administration under the same ministry.

Few years back there was a big fusion in research field, when The Natural Resources Institute Finland (Luke) was established. Luke covers widely the agricultural, forestry, food and natural resource sector. There is right now discussion going on with the ministry, Luke and ProAgria to build up a body to disseminate the research results to the farmers more efficiently.

The climate change is attacking all of us. It has brought new co-operation with environment organizations. For example ProAgria is working with Baltic Sea Action Group in disseminating information material and web learning courses to the

farmers and advisors. ProAgria is as well one of the owners of a company called Biocode, which is specialized on carbon foot print calculating.

ProAgria operates internationally as well, mainly in Russia and the Baltic region. Moreover, ProAgria is an active partner in advising cooperation and development work with other Nordic countries. ProAgria is as well an active part in several international and national EU-projects.

EU-projects are very popular in Finland. They usually require co-operation between different organizations. ProAgria is running annually big number of partly EU-funded projects, partners are usually universities, research institutes, other advising organizations, farmers' co-operatives, development companies, associations, farmers' union etc. Most of the projects are operating locally. Working together gives a good opportunity to get know each other and sometimes it brings more co-operation after the project has finished.

## **4.6. Programming and planning of advisory work**

The national focus points in rural advising are agreed annually in the discussions with the Ministry of Agricultural and Forestry. European Union Common Agricultural Policy and political programs have influence as well. International rules control advisory work in cases like milk recording. Main services for the farmers are quite stable year after year, although improvements, new innovations, tools, key performance indicators and digital services are published almost every year.

ProAgria has a common development work, which is mainly done in the Association of ProAgria Centres in co-operation with local ProAgria organizations. Most of the R&D includes operations with the common agricultural data bank and IT services by MTech Digital Solutions.

Some ideas for new services or methods come from EU-projects or ideas are tested with the help of them. This is a very economical way of doing R&D and gives a possibility to involve customers immediately into the process. One of the big successes, small group peer-learning, is one of them. Small groups of farmers are called on special issue, sometimes the issue is given, sometimes they decide it in

the group. Group is meeting regular on each others' farms or elsewhere, get known the management and methods, which each member of the group is operating on the farm, discussing, evaluating etc. The advisor has a role as a facilitator. Farmers appreciate very highly colleague experience and are more willing to try new methods if a fellow farmer is promoting it. Most of the peering groups are operating in grass production, some on economics, HR, lean, animal welfare and so on. In this pandemic times peer-groups are meeting in Teams and field or barn visits are done video assisted.

ProAgria is focusing on customer's success. Customers are very often involved in pilot phase in developing new methods, services etc. Customer reflections and satisfactory are measured regularly. In addition the advisors collect feedback daily. Results are very good.

Recent investments has been done on implementing consultative procedure in advising, starting with educating strategy consultants, HR consultants and moving on to production consultants (dairy, plant). Lean management is spreading slowly in Finnish farms, most popular it is in dairy. Supporting both HR and lean ProAgria published a mobile tool for measuring farm working time. Environmental services are in increasing focus. ProAgria published last year a book of climate-wise agriculture, to increase knowledge of climate change basics and introduce useful methods for fighting against it on farms. There was a big seminar on that issue as well. Podcasts based on the book are very popular.

There has been several years a special group of "top know-how"-consultants working on dairy-, plant, planning- and organic production sectors. The task of these "top know-how"-consultants is to search for new information from abroad, networking in international seminars and bring new methods into practice by helping colleagues and serve the most developing customers.

ProAgria renewed it's strategy in the beginning of 2020. It is leading the advising work with action plans.

Mission: We enable the most clean and vital rural area in the world.  
Vision: We offer the best client experience in business developing.

The goals are:

- 1) We are the most overwhelming partner to our consumers in value adding.
- 2) By sustainability, profitable and effectiveness
- 3) Actively improving the customer's whole business
- 4) Respected leading organization



Fig 3. ProAgria strategy

## 4.7. Advisory organizations forming the FAS and evaluation of their FAS implementation

Farmers are allowed to use a fixed amount of EU-based the governmental money annually for buying advising just paying the tax of the service (FAS). In Finland this service is called Neuvo ("advice"). The Finnish Food Authority is accepting licenses for the advisors who are allowed to sell these services. Most of the authorize advisors work for ProAgria, very many of the others are private vets. All the approved advisors can be found in <https://tilaneuvojat.ruokavirasto.fi/#/fi>.

A farmer can buy advising in energy, plant protection and plant farm food and feed hygiene, organic plant production, organic animal production, environment, animal production, animal welfare plans and modernize farms and improve their competitiveness. The last one has been most popular. Farmers like to finance one part of the advising by FAS. It is a handy way of decreasing the invoice sum for the



farmers but at the same time gives a little bit false picture of the true prize and value of the service.

## 5. Summary and conclusions

### 5.1 Summary and conclusions on section 1 – 3

Finland is the most sparsely populated country in European Union, 338 455 square kilometres with population of 5,5 million. The climate varies significantly from Southern Finland's humid continental climate to the boreal climate of the north. Finland is primarily a boreal forest biome. Most of the land is covered with forests and there are more than 180 000 lakes as well.

Location in the north characterizes the agricultural, most of the farms lies between 60th and 65th parallel and growing season is short. Dairy is the most important agricultural sector and can be operated in the north part of the country as well. Dairy cows feeding is based on grass silage, which grows well all over the country because of long summer days. Primary production represents 2.9% of GDP. Finland is self-sufficient in most of the agricultural products.

Forests play a key role in Finnish economy, making it one of the world's leading wood producers and providing raw materials for wood-processing industries. Most of the forests are private owned and most of the farms have forest as a part of their operations. The government has a strong historical role in forestry management, cuttings and plantings are regulated, the main advising bodies (Tapio, Metsäkeskus) are owned by the government and making long-term strategies on timber resources.

In agricultural the main management body is Finnish Food Authority, which operates under the Ministry of Agriculture and Forestry. Agricultural policy and legislations are born in the parliament.

The role of farmers is very strong in Finland in AKIS network. The advising business in Finland is mainly owned by the farmers. In the history several associations and co-operatives have merged to national organizations. The majority of food industry has co-operative structure as well.

### 5.2 Summary and conclusion on sections 4

The leading operator in agricultural and rural advising is ProAgria, providing expert

services and know-how to develop competitiveness in agriculture and rural businesses.

The biggest rural advisory organization in Finland is ProAgria, association owned by members. ProAgria advisory services cover the whole country and most of the services needed in farms, horticultural and rural businesses, 650 specialists, >80% of farms and > 1 ha in cultivation planning.

FABA co-op is operating as an EU-status breeding organization in dairy and beef breeding in the whole country (7500 members, 350 specialists). Pig breeding is managed by slaughter industry, in Finnish-Swedish level co-operative one and national by a private meat industry. Horse breeding is runned by Hippos, horse owners associations.

Most of the private advising organizations are small, 1-35 specialists and mainly operating locally in economics or veterinarian services.

Special advising s managed by different organizations focused on that animals (horses, fur, bees, horticultural etc.).

Co-operative food and forest industry has an important role in advising, both serving their owners themselves and in collaboration with big advising organizations.

In silvicultural advising is very much concentrated in government owned organizations (Tapio, Metsäkeskus), which work very closely together. ProAgria is serving forest owners in economics, changing ownerships and the whole farm services (strategic planning etc) if the forest is part of a farm.

The policy of agricultural advising is based on public-private partnerships. The Ministry of Agricultural and Forestry (MMM) focuses in different strategies and declarations it's will in agricultural policies and discusses regularly with the biggest advising organizations. The Finnish Parliament determines annually a small amount of subsidies to advisory work to full fill the focus and keep services available in the whole country. The Ministry has s steering role in supported issues. Discussions with the authorities and policy makers is a natural lobbying role of an advising organization.

Most of the advising organizations income is based on customer payments, governmental share is usually less than 15% if any.

The structure and needs of the customers vary a lot depending on type of business, size of the farm, life cycle of the firm etc. There is a trend to focus more on the whole business (farm, firm) instead of a single process. Importance of economics, strategy and leadership is increasing. The role of the farmer is changing from a traditional farmer into an entrepreneur or a leader.

Demands for advising is changing as well. Future farmers are more educated and need more specialized advice. The role of an advisor will be more like a business coach, working as a consultant.

We have rapidly moved on face to face advising into remote systems in Covid epidemic times. This will bring us a hybrid model to be used in normal times to serve farmers with digital systems, remote contacting and using visit only when it is needed. Finland is a big country and distances are long at the countryside. Hybrid advising model is saving time and costs when leaving out traveling. At the same there will be less emissions.

## 6. References

This report has been collected by Jaana Kiljunen, Association of ProAria Centres, based on the knowledge of AKIS operators in ProAria and stakeholders and the previous report in 2014 written by Danuta Jaakkola.

FABA, history of animal breeding in Finland [www.faba.fi](http://www.faba.fi)

Kantar TNS 2020, Maatilojen kehitysnäkymät ProAria 2027  
maatalous 2020 [www.kantar.fi](http://www.kantar.fi)

Luonnonvarakeskus [www.luke.fi](http://www.luke.fi), Natural Research Institute\_Statistic database

Maatalous myös tulevaisuuden elinkeino, Reijo Karhinen, report 2019

[https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/161359/MMM\\_3\\_2019\\_Turvallista%20ruokaa%20Suomesta.pdf](https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/161359/MMM_3_2019_Turvallista%20ruokaa%20Suomesta.pdf)

MMM - Ministry of Agriculture and forestry [www.mmm.fi](http://www.mmm.fi)

MTK Farmers' and Forest Owners Union [www.mtk.fi](http://www.mtk.fi)

Nordic Cattle Breeding Evaluation <https://www.nordicebv.info/>

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Ruokatieto

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Ruokavirasto [www.ruokavirasto.fi](http://www.ruokavirasto.fi)

Suomen Hippos, [www.hippos.fi](http://www.hippos.fi)

Suomen Metsäyhdistys [www.smy.fi](http://www.smy.fi) [www.forest.fi](http://www.forest.fi)

Tapio [www.tapio.fi](http://www.tapio.fi)

Tilastokeskus [www.stat.fi](http://www.stat.fi)

Viking Genetics <https://www.vikinggenetics.fi/>

[Wikipedia.org](http://Wikipedia.org)

## Appendices

### 1. List of AKIS operators in Finland

Type	Organization	web
Rural advising	Central Organization on Rural Advisory Centres	<a href="http://www.proagria.fi">www.proagria.fi</a>
Rural advising in Finnish	ProAgria Etelä-Pohjanmaa	<a href="http://www.proagria.fi">www.proagria.fi</a>
Rural advising in Finnish	ProAgria Etelä-Suomi	<a href="http://www.proagria.fi">www.proagria.fi</a>
Rural advising in Finnish	ProAgria Etelä-Savo	<a href="http://www.proagria.fi">www.proagria.fi</a>
Rural advising in Finnish	ProAgria Itä-Suomi	<a href="http://www.proagria.fi">www.proagria.fi</a>
Rural advising in Finnish	ProAgria Keski-Pohjanmaa	<a href="http://www.proagria.fi">www.proagria.fi</a>
Rural advising in Finnish	ProAgria Keski-Suomi	<a href="http://www.proagria.fi">www.proagria.fi</a>
Rural advising in Finnish	ProAgria Lappi	<a href="http://www.proagria.fi">www.proagria.fi</a>
Rural advising in Finnish	ProAgria Länsi-Suomi	<a href="http://www.proagria.fi">www.proagria.fi</a>
Rural advising in Finnish	ProAgria Oulu	<a href="http://www.proagria.fi">www.proagria.fi</a>
Construction	Maveplan	<a href="http://www.proagria.fi">www.proagria.fi</a>
Rural advising in Swedish	Svenska Lantbrukssällskapens förbund	<a href="http://www.slf.fi">www.slf.fi</a>
Rural advising in Swedish	Nylands Svenska Lantbrukssällskap	<a href="http://www.nsl.fi">www.nsl.fi</a>
Rural advising in Swedish	Finska Hushållningssällskapet	<a href="http://www.fhs.fi">www.fhs.fi</a>
Rural advising in Swedish	Ålands Hushållningssällskap	<a href="https://landsbygd.ax/">https://landsbygd.ax/</a>
Rural advising in Swedish	Österbottens Svenska Lantbrukssällskap	<a href="http://www.osl.fi">www.osl.fi</a>
Rural advising	Wikli-Group	<a href="http://www.wikli.fi">www.wikli.fi</a>
Economics	Envitecpolis	<a href="http://www.envitecpolis.fi">www.envitecpolis.fi</a>

Economics	Finanssila	<a href="http://www.finanssila.fi">www.finanssila.fi</a>
Economics	Rantalainen	<a href="http://ww.rantalainen.fi">ww.rantalainen.fi</a>
Dairy industry	Valio	<a href="http://www.valio.fi">www.valio.fi</a>
Dairy industry	Osk. Tuottajain Maito	<a href="http://www.valio.fi">www.valio.fi</a>
Dairy industry	Osk. Länsi-Maito	<a href="http://www.valio.fi">www.valio.fi</a>
Dairy industry	Osk. Maitosuomi	<a href="http://www.valio.fi">www.valio.fi</a>
Dairy industry	Osk. Pohjolan Maito	<a href="http://www.valio.fi">www.valio.fi</a>
Dairy industry	Arla Suomi	<a href="http://www.arla.fi">www.arla.fi</a>
Dairy industry	Juustoportti	<a href="http://www.justoportti.fi">www.justoportti.fi</a>
Dairy industry	Maitokolmio	<a href="http://www.maitokolmio.fi">www.maitokolmio.fi</a>
Dairy industry	Osuuskunta Maitomaa	<a href="http://www.maitomaa.fi">www.maitomaa.fi</a>
Dairy industry	Satamaito	<a href="http://www.satamaito.fi">www.satamaito.fi</a>
Feed industry	Lantmännen	<a href="http://www.lantmannen.fi">www.lantmannen.fi</a>
Feed industry	Hankkija	<a href="http://www.hankkija.fi">www.hankkija.fi</a>
Feed industry	Kinnusen Mylly	<a href="http://www.kinnusenmylly.fi">www.kinnusenmylly.fi</a>
Feed industry	Feedex	<a href="http://www.feedex.fi">www.feedex.fi</a>
Feed industry	Vilomix	<a href="http://www.vilomix.fi">www.vilomix.fi</a>
Meat industry	Atria	<a href="http://www.atria.fi">www.atria.fi</a>
Meat industry	HKScan	<a href="http://www.hkscan.fi">www.hkscan.fi</a>
Meat industry	Snellman	<a href="http://www.snellman.fi">www.snellman.fi</a>
Horse breeding	Suomen Hippos	<a href="http://www.hippos.fi">www.hippos.fi</a>
Cattle breeding	FABA	<a href="http://www.faba.fi">www.faba.fi</a>
Vet services	Emovet	<a href="http://www.faba.fi">www.faba.fi</a>
Cattle breeding	Viking Genetics	<a href="http://www.vikinggenetics.com">www.vikinggenetics.com</a>
Poultry	Suomen Siipikarjaliitto	<a href="http://www.siipi.net">www.siipi.net</a>
Horticultural	Puutarhaliitto	<a href="http://www.puutarhaliitto.fi">www.puutarhaliitto.fi</a>
Horticultural	Kauppapuutarhaliitto	<a href="http://www.kauppapuutarhaliitto.fi">www.kauppapuutarhaliitto.fi</a>
Organic	Luomuliitto	<a href="http://www.luomu.fi">www.luomu.fi</a>
Organic	Demeter	<a href="http://www.demeter.fi">www.demeter.fi</a>
Bees	Suomen Mehiläishoitajain Liitto	<a href="http://www.hunaja.fi">www.hunaja.fi</a>
Fur	Suomen Turkiseläinkasvattajien Liitto	<a href="http://www.fifur.fi">www.fifur.fi</a>
Youth	4H	<a href="http://www.4H.fi">www.4H.fi</a>
Farmers' Union	Maa- ja metsätaloustuottajien	<a href="http://www.mtk.fi">www.mtk.fi</a>
Forest	Tapio	<a href="http://www.tapio.fi">www.tapio.fi</a>
Forest	Metsäkeskus	<a href="http://www.metsakeskus.fi">www.metsakeskus.fi</a>
Forest	MetsäGroup	<a href="http://www.metsagroup.fi">www.metsagroup.fi</a>
Forest	Stora Enso	<a href="http://www.storaenso.fi">www.storaenso.fi</a>
Forest	UPM	<a href="http://www.upm.fi">www.upm.fi</a>

Reseach	Luonnonvarakeskus	<a href="http://www.luke.fi">www.luke.fi</a>
Reseach	Työtehoseura	<a href="http://www.tts.fi">www.tts.fi</a>
University	Helsinki University	<a href="http://www.helsinki.fi">www.helsinki.fi</a>
Univ. Applied Science	Hämeen ammattikorkeakoulu	<a href="http://www.hamk.fi">www.hamk.fi</a>
	Jyväskylän ammattikorkeakoulu	<a href="http://www.jamk.fi">www.jamk.fi</a>
	Laurea ammattikorkeakoulu	<a href="http://www.laurea.fi">www.laurea.fi</a>
	Savonia ammattikorkeakoulu	<a href="http://www.savonia.fi">www.savonia.fi</a>
	Seinäjoen ammattikorkeakoulu	<a href="http://www.seamk.fi">www.seamk.fi</a>
	Yrkehögskolan Novia	<a href="http://www.novia.fi">www.novia.fi</a>
Forest education	Metsäalan ammattioppilaitokset	<a href="http://www.metsaopetus.fi">www.metsaopetus.fi</a>
Farm education	Suomen Yrittäjäopisto	<a href="http://www.syo.fi">www.syo.fi</a>
Ministry	Maa- ja metsätalousministeriö	<a href="http://www.mmm.fi">www.mmm.fi</a>
Food authority	Ruokavirasto	<a href="http://www.ruokavirasto.fi">www.ruokavirasto.fi</a>
Centre for Economic Development, Transport and the Environment	ELY	<a href="http://www.ely-keskus.fi">www.ely-keskus.fi</a>

# AKIS and advisory services in *Germany*

## Report for the AKIS inventory (Task 1.2) of the i2connect project

*Date: January, 2021*

**Authors:**

Fanos Mekonnen Birke  
Sangeun Bae  
Annkatrin Schober  
Maria Gerster-Bentaya  
Andrea Knierim  
Pablo Asensio  
Margret Kolbeck  
Carola Ketelhodt

Contact: [andrea.knierim@uni-hohenheim.de](mailto:andrea.knierim@uni-hohenheim.de)

Project funded under the Horizon 2020 Research and Innovation Programme under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION' HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

This report aims to provide an overview of the Agricultural Knowledge and Innovation System (AKIS) as well as the Forestry Knowledge and Innovation System (FKIS) in Germany. In doing so, the report takes stock of the relevant actors in the German agriculture and forestry actors and provides particular insights on advisory service providers. The report's main sections include characteristics of AKIS actors, policy framework, funding mechanisms, and advisory services. While the report builds on the earlier AKIS report for Germany conducted by the PRO AKIS project in 2014, it also brings in a renewed assessment of the agricultural and forestry advisory and innovation services and describes actors' linkages and knowledge flows in the sector.

The German AKIS report is one of 29 AKIS country reports produced in 2020 by the i2connect project partners and subcontractors. AKIS describes the exchange of knowledge and supporting services between diverse actors from the first, second or third sectors. With the next CAP reform ahead that envisages a strategic strengthening of member states' AKIS, an update of the AKIS report and a renewed assessment of agricultural advisory and innovation support services will provide useful and timely information for the various AKIS stakeholders operating in the sector.

The German agriculture sector exhibits a general trend towards a decrease in the number of farm holdings and an increase in the average farm size per holding. Also, distinction in farm size between the former Eastern and the Western German States is visible. Concerning the forestry sub-sector, Germany remains in the front line for timber production compared to other European countries. The UAA for forestry remains stable so far, where 52% of the forest area belongs to the public sector.

Diverse actors from all organisational categories: public authorities, research and education, private sector, farmer-based organisations and third sector non-governmental organisations characterize the German AKIS. Moreover, the heterogeneous and decentralised governance structure where the Federal Government and the 16 states (Länder) take an active role provide a unique perspective to the AKIS in the country. While the various coordination structures and policy frameworks in place make the German AKIS a strong one, the

decentralised system and actors' heterogeneity make the linkages within the AKIS actors partly fragmented.

The heterogeneity of the German advisory services has a long-standing history and the trend continues. Nowadays, a more pluralistic mode of advisory delivery, where the public, private and third sector organisations offer different service is prominent. According to the survey results, in general, advisors in the service organisations have many years of professional experience and good educational backgrounds; further advisory certifications such as CECRA courses as additional qualifications are considered essential for advisors. The clients of advisory service providers range from small or medium and to large scale farmers, with no particular target group recognised per type of service provider. In contrast, targeted services for specific interest groups such as farmworkers, new entrants, or other advisors seem rare. Advice offered includes cross-cutting topics such as entrepreneurship and farm management, support with the grant application and agri-environmental stewardship measures and nature protection as well as the conventional topics such as crop production, livestock production, farm machinery and building construction. The survey results showed that advisors spend 43% of their time in targeted consultation service and divide the remaining in other advisory activities. While the link between research and practice still requires more work, the strong cooperation and linkage with public authorities, FBOs and private companies affirms the important role these actors have in knowledge sharing, service provision, and connecting actors in the overall AKIS.

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## Abbreviations

ABL	Arbeitsgemeinschaft bäuerliche Landwirtschaft
ÄELF	Ämter für Ernährung, Landwirtschaft und Forsten
AKIS	Agricultural Knowledge and Innovation System
AWG	Bayerisches Amts für Waldgenetik
AWU	Annual Work Unit
BaySF	Bayerische Staatsforsten
BLE	Bundesanstalt für Landwirtschaft und Ernährung
BMEL	Bundesministerium für Ernährung und Landwirtschaft
BÖLW	Bund Ökologische Lebensmittelwirtschaft
BZL	Bundesinformationszentrum Landwirtschaft
CAP	Common Agricultural Policy
CECRA	Certificate for European Consultants in Rural Areas
	Dachverband Agrarforschung wissenschaftlicher
DAF	Gesellschaften der Agrar-, Forst-, Ernährungs-, Veterinär- und Umweltforschung e.V
DAFA	Deutsche Agrarforschungsallianz
DBV	Deutscher Bauernverband
DIP	<b>Deutsche Innovationspartnerschaft</b>
DLG	Deutsche Landwirtschaftsgesellschaft
DLV	Deutscher Landfrauenverband
DRV	Deutscher Raiffeisenverband
DVS	Deutsche Vernetzungsstelle Ländliche Räume
DWD-ZAMF	Deutscher Wetterdienst- Zentrum für Agrarmeteorologische Forschung Braunschweig
EAFRD	European Agricultural Fund for Rural Development
EIP-Agri	European Innovation Partnership for Agricultural productivity and Sustainability
EU	European Union
FAS	Farm Advisory System
FBO	Farmer Based Organization
FKIS	Forest Knowledge and Innovation System
FLI	Friedrich Loeffler Institute

FNR	Fachagentur Nachwachsende Rohstoffe
FZuS	Forstwirtschaftliche Zusammenschlüsse
GAK	Gemeinschaftsaufgabe Agrarstruktur und Küstenschutz
GDP	Gross Domestic product
GDR	German Democratic Republic
IALB	Internationale Akademie für ländliche Beratung
JKI	Julius Kühn Institute
KWF	Kuratorium für Waldarbeit und Forsttechnik
LSU	Livestock Unit
LWF	Bayerische Landesanstalt für Wald und Forstwirtschaft
MRI	Max Rubner Institute
NGO	Non-Government Organization
SO	Standard Output
StMELF	Bayerisches Staatsministerium für Ernährung, Landwirtschaft und Forsten
TI	Johann Heinrich von Thünen Institute
UAA	Utilised Agriculture Area
vlf	Bundesverband Landwirtschaftlicher Fachbildung
VLK	Verband der Landwirtschaftskammern

## 1. Main structural characteristics of the agricultural and forestry sector

This section provides a brief overview of the structural characteristics of the German agriculture and forestry sector. The information provided is based on the review of policy documents, and information from the national and European level databases such as DESTATIS and EUROSTAT.

With its 83.01 million inhabitants, the federal republic of Germany has the largest population of all the EU member states (EUROSTAT, 2020d [demo\_pjan]). Situated in central Europe, it expands from the Baltic Sea in the North to the Alps in the South. It is a federal republic comprising 16 states, so-called Länder, of which 13 are considered territorial states and 3 are city-states (Berlin, Hamburg and Bremen). About 51% of Germany's land is used for agriculture (33% arable land and 13% permanent grassland) and another 30% for forestry (Statistisches Bundesamt [Destatis], 2020e)

### 1.1. Agricultural and forestry structures and holdings

Germany's total territory amounts to 35.7 million hectares, and almost half (16.7 million hectares) of it goes to the Utilised Area for Agriculture (UAA), which comprises arable land and permanent grassland (Destatis, 2019). The UAA in Germany, one of the highest in the EU, has remained relatively stable over the past twenty years. In contrast, the number of holdings decreased from 299,310 in 2010 to 266 700 in 2018 (EUROSTAT, 2020b; Destatis, 2020a). This means more than thirty thousand holdings ceased their agriculture activity in just a few years. While the absolute number of farms has decreased, the average farm size of those existing holdings has increased over the years. In 2018, the average farm size was 60,5 hectares compared to 55,8 hectares in 2010 (BMEL, 2019a, p. 108).

The agricultural structure reveals a typical dichotomy in terms of the number of farm holdings and farm sizes in the German states. Of the total 266,700 farm holdings, 91% are situated in the old states (Länder) and manage farms with mostly less than 50 hectares. The remaining 9.3% are in the five eastern states of the former German Democratic Republic (GDR), managing farms of mostly more than 100 hectares (Destatis, 2019). The former GDR states have a larger proportion (59%) of the total UAA in Germany.

Over the past ten years, organic farming has gained importance in German agriculture. Land allocated for organic farming has expanded by 470,000 hectares since 2014 (BMEL, 2019a, p. 81), raising the total area of organically farmed land to 1.52 million hectares, which corresponds to 9,1 % of the UAA (BMEL, 2019a).

Same as the UAA, the land used for forestry remains stable in Germany. The forest area amounts to 11.4 million hectares, of which 10.9 million hectares is for timber. Germany's timber stocks account for 3.7 billion m<sup>3</sup>, making the country in the front line for timber production compared to other European Union countries (EUROSTAT, 2019, p. 88).

Forest ownership is mainly public (52%) - where the states own 29%, communities and associations own 19%, and the federal government owns 4%. The remaining 48% of forest land is privately owned. The number of communal and private forest owners in Germany is estimated at two million (BMEL, 2014). The private forests are predominantly small, where 50% comprise less than 20 hectares and only 13% are more than 1,000 hectares. Some forest owners have also agriculture land as well. The proportion of forest area and the ownership structure developed differently over history and among the states (BMEL, 2019a, pp. 95–96). Regarding types of wood, German forests are characterised by about 90 billion old and young spruces, pines, beeches, oaks and other tree species (BMEL, 2014).

## **1.2. Contribution of agriculture to the German economy and income**

Germany's gross domestic product (GDP) per capita has witnessed a consistent increase in the past three years from €39,259 in 2017, to €40,339 and €41,346 in years 2018 and 2019 respectively (Destatis, 2020f). In contrast, there was a slight decrease in agriculture's contribution to the Gross Domestic Product with 0.5% in 2018 (EUROSTAT, 2019, p. 155) compared to 0.7% in 2017 (BMEL, 2019a, p. 51). Regardless, Germany's agricultural gross domestic product is among the four largest sectoral products in the European Union.

The total standard output (SO) of all German farm holdings has shown a steady increase, where it was €46.252m, €49.242m and €65.662m in years 2013, 2016 and 2017/18 respectively (EUROSTAT, 2020b[ef\_m\_farmleg]); BMEL, 2019a). When classifying the agricultural holdings into standard output classes, 24% of the holdings produce between €50,000 and €100,000; 38.4% of the holdings produce

between €100,000 and €250,000 and 36.9% of the holdings produce more than €250,000 (BMEL, 2019a, p. 62).

In Germany, over a quarter of the arable land is used for wheat production. In 2019, the top agricultural products in terms of harvested production were sugar beet (29.7 million tons) and wheat (23 million tons)(Destatis, 2020c). Fruits and vegetables with the highest harvest were apples (973,400 t), asparagus (104,400 t) and strawberries (99,000t) (Destatis, 2020d). The domestic farming sector meets about a third of Germany's demand for vegetables and a fifth for fruit. The remaining amount are imported from other European countries and international (BMEL, 2019b).

In terms of livestock population, there are 11.4 million cattle, 25.5 million pigs, and 41 million hens (Destatis, 2020b). Germany is the largest milk producer in the EU and, after France, the second-largest producer of beef and veal. Pig farming is the mainstay of the domestic farming sector, where pork holds the first rank as a source of meat in Germany (BMEL, 2019b). Regardless, the total Livestock Unit (LSU) in Germany featured a slight decrease from 18.4million in 2013 to 18.1 million in 2016 (EUROSTAT, 2020c[ef\_Isk\_main]). Also, a 7% decline in the number of farm holdings with livestock has been observed between 2013 and 2016 (BMEL, 2019a, p. 110).

### **1.3. Contribution to employment and demographic structure**

The agriculture sector in Germany has a 1.3% share of the country's total employment(EUROSTAT, 2019, p. 155). In 2018, the annual work unit (AWU) - full time equivalent employment - for Agriculture was 474.00, which showed a decline from 477.60 in 2017 and 480.00 in 2016 (EUROSTAT, 2020a[aact\_ali01]). Farms with more than 50% regular labour from family members represent 94% of the total share of all farm holdings. A closer look at the age structure of farm managers in Germany reveals that only 14.7% of farms are managed by farmers who are 40 years old or younger. Female farmers represent 9.6% of farmers in Germany (EUROSTAT, 2019, p. 137). The small representation of young and female farmers shows the challenge the agriculture sector faces to adapt to the new generation.

Concerning the forestry sub-sector, the forest and timber industry, including processing and paper and printing and publishing, accounted for nearly 1.3 million

jobs with an annual turnover of about 170 billion (BMEL, 2014). Specifically, for forestry and logging, the AWU in 2017 was 48.01, which showed a small decline from 48.9 in 2016 and 50.21 in 2015 (EUROSTAT, 2020b[for\_emp\_lfs]).

## 2. Characteristics of AKIS and FKIS

### 2.1. AKIS and FKIS description

As already described by Paul et al. (2014) in the PRO AKIS report, the German AKIS is characterised by a heterogeneous and decentralised governance structure where the Federal Government and the 16 states (Länder) take an active role. Therefore, the multifaceted organisational setting at the national level has only a limited impact on the state level (Knierim et al., 2015). In this section, we present the German AKIS from a national perspective. In addition, to illustrate the institutional diversity among the federal states, we present two examples of state-level AKIS: Bavaria and Schleswig Holstein. Furthermore, as the forestry sub-sector is unique, we describe Germany's forest knowledge and innovation system as a separate sub-section.

#### 2.1.1. AKIS actors and knowledge flows at the national level

**The public sector of the German AKIS** includes the Federal Ministry of Food and Agriculture (BMEL<sup>1</sup>) and its subordinate agencies. The BMEL is responsible for all higher-level matters in the agricultural sector, however, it does not play a big role in the advisory services, which is predominantly the states' responsibility. As an authority subordinate to the BMEL, the Federal Agency for Agriculture and Food (BLE<sup>2</sup>) is responsible for information service provision at the federal level and acts as a project management agency of the BMEL. The Federal Information Centre for Agriculture (BZL<sup>3</sup>), and the German Agency for the Networking of Rural Areas (DVS<sup>4</sup>) are based in the BLE with the mission to disseminate information and coordinate the cooperation and exchange among various actors. BZL, as a knowledge-based information service provider for agriculture and all related subjects, collects and analyses data and information for wider dissemination. The DVS was set up to support cooperation and exchange between administrative and

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<sup>1</sup> *Bundesministerium für Ernährung und Landwirtschaft*

<sup>2</sup> *Bundesanstalt für Landwirtschaft und Ernährung*

<sup>3</sup> *Bundesinformationszentrum Landwirtschaft*

<sup>4</sup> *Deutsche Vernetzungsstelle Ländliche Räume*

scientific actors and practitioners in agriculture and rural areas, e.g. via thematic networking events, a topical newsletter as well as a regular journal. According to the expert interviewees, the DVS plays a key role in supporting the European Innovation Partnership (EIP) Operational Groups, which have a limited outreach to AKIS actors in Germany. The experts also emphasised the need to scale up the experiences from the EIP operational groups to the broader German AKIS. Another important task in BLE is coordinating relevant EU research affairs and participating conceptually in EU bodies, representing the position of the BMEL. Via this task, the BLE advises the BMEL and German research institutions in the agricultural and food sector on cross-border cooperation under the EU Research Framework Programmes. However, according to the interviews, the linkage of the EU research affairs with the rest of the German AKIS actors for knowledge exchange is minimal.

The BMEL finances **four federal agricultural research institutions**: The Thünen Research Institute for Rural areas, forestry, agriculture and fisheries (TI); Julius Kühn Research Institute for Cultivated Plants (JKI); Friedrich Loeffler Research Institute for Animal Health (FLI); and Max Rubner Research Institute for Nutrition and Food (MRI)(BMEL, 2020a). The institutes primarily work on scientific guidance in decision-making for the BMEL. **Six Leibniz institutes** are also co-funded by the BMEL and the federal states in which their headquarters are located. These institutes conduct application-oriented basic research in the green sector and complement the federal research institutes (BMEL, 2020a). At the regional level, the states are responsible for conducting research and demonstration projects in the **state level research institutes** that carry out practical tests or adaptive research for their respective states and across Germany. These bodies sit in the state ministries of agriculture or in the chambers of agriculture. The so-called *Arbeitsgemeinschaft der Ressortforschungseinrichtungen*, a working group that brings together more than 40 federal research institutions for knowledge exchange, quality assurance of scientific work and cooperation with the state/departmental research institutes. The federal ministries are responsible for coordinating the *Ressortforschung* working group.

As can be observed from above, the BMEL interacts with a large pool of public research institutions to shape Germany's agricultural research direction and to set new trends and opportunities for excellent research and innovation transfer. Nevertheless, the interviewees affirmed the system's inefficiency in transferring

or disseminating research results to other AKIS actors in Germany and expressed the need to strengthen the linkages.

**The German Agricultural Research Alliance (DAFA<sup>5</sup>)** congregates the publicly funded agricultural research institutions in Germany. DAFA primary aims to support the BMEL in setting strategic agendas for agricultural research and future trends in specific topics by coordinating various publicly funded research institutions. Members of DAFA include units at universities, non-university research facilities, federal and state research institutes, independent research institutes, and agriculture chambers with a research component. Since the last ten years, DAFA actively supported the research agenda, particularly in livestock, legumes, grassland, bees in agriculture, organic agriculture and aquaculture. Another integrative agricultural research association is the umbrella organisation of Agriculture research (DAF<sup>6</sup>). DAF, a multidisciplinary association of leading scientific societies in the sectors of agriculture, forestry, food, veterinary and environmental research, was founded in 1973 to replace the former 'Research Council's tasks in Germany (FISA, 2020).

The agriculture education system in Germany involves various actors and responsibilities at different levels: (i) basic professional training (*Berufsausbildung*), (ii) advanced training (*Fortbildung*), (iii) University education (*Studium*) and (iv) further education (*Weiterbildung*).

- (i) The basic professional training, regulated by the Vocational Training Act (BBiG<sup>7</sup>) at the federal level, takes place in the dual system frame. In this context, vocational schools (*Berufsschule*) and (agricultural) company or enterprises conduct the training. Additionally, Agro-Technical-Schools, Animal-Husbandry-Schools or Forestry Schools linked to research institutions engage in inter-company training. Highly qualified and pedagogically well-trained professional masters (*Meister*) or instructors (*Ausbilder*) on the farms and in the enterprises, together with the schools form the backbone of a practice-oriented transfer of knowledge and know-how to the next generation of agricultural workers and forestry personnel.

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<sup>5</sup> *Deutsche Agrarforschungsallianz*

<sup>6</sup> *Dachverband wissenschaftlicher Gesellschaften der Agrar-, Forst-, Ernährungs-, Veterinär- und Umweltforschung e.V.*

<sup>7</sup> *Berufsbildungsgesetz*

Vocational training schools continue to develop the capacity of many young professionals in the German agriculture sector. For instance, in the year 2019, a total of 32,331 young people studied the 14 agricultural professions offered in the (BMEL, 2020c, p. 27). Our interviewees affirmed that vocational schools are crucial actors in the German AKIS. Furthermore, some interviewees stressed the importance of explicitly including topics, communication, public relation and personal competence in the vocational school curriculum.

- (ii) Secondary technical schools (*Fachschule*) and higher agricultural schools (*Höhere Landbauschule*) offer advanced training opportunities for those who completed basic professional training from the dual system. In particular, agricultural professionals who aspire to have a full-time agricultural occupation use advanced training opportunities. The secondary schools offer farmers qualifications that allow them to train apprentices on their farms, gardening or forestry enterprises or labs. According to BLE (2020), the number of secondary technical schools that provide advanced training in the federal states amount to 353
- (iii) Universities of applied sciences and agricultural science universities train theoretical and practical education in agriculture. Throughout the country, a total of **ten universities and 13 universities of applied sciences are dedicated to agricultural study programs** (VDL, 2020). The so-called old states, host majority of those universities. Universities of Applied Sciences focus particularly on applied research questions and include a higher amount of practice and internships in practical farms than science universities. Consequently, the applied universities cooperate more with practitioners, companies, associations and organisations at the local level.
- (iv) Various universities and technical schools offer further education (*Weiterbildung*) courses on diverse topics and duration for all agricultural professionals who want to acquire knowledge and skills to meet new challenges in their profession. For example, publicly financed organisations such as the federal **teaching and research institutes** (*Lehr- und Versuchsanstalten*) provide possibilities for conducting specific experimentations for those from vocational schools as well as for other individuals interested in specific topics. Privately financed organisations such as the German Agricultural Society's **DLG Academy** and the **Andreas-Hermes Academy** of the German Farmers Association also provide further education courses. There are also numerous associations with more

specific educational functions for agricultural and rural actors and **professional associations** with an (agro-) ecological working focus.

**State agriculture offices** in the states of Bavaria, Baden-Württemberg, Hessen and Rhineland-Palatine provide holistic agricultural economic advice (Knierim, Thomas, & Schmitt, 2017b). However, their mode of service delivery evolved in the past years. For instance, in Baden-Württemberg, the state office provides free advice to farmers only on general questions. It leaves advice on specific issues such as production technologies and farm entrepreneurship or confidential questions to private advisors. Private advisors are admitted and supported for providing modularised, content-wise targeted services in a two-stage concession process. Farmers contract private advisors and contribute financially to the service provision.

Meanwhile, agriculture offices at a state and district level are more engaged in holistic advisory services such as agriculture investment promotion, rural development and following up on regulatory issues related to the use of EU EAFRD funds. On the other hand, private advisors offer advisory modules on specialised topics such as business management, plant and animal production, organic farming, income combinations, environment, and energy. Similarly, Bavaria introduced a two-tier system in 2006, that allows the state agriculture offices and non-governmental advisory organisations to offer service in complementarity (Knierim et al., 2017b).

**Chambers of agriculture** are described as self-governing bodies of the farmers and the state governments, thus acting as a kind of hybrid organisation between the public sector and Farmer Based Organisations (FBOs). In Germany, chambers of agriculture exist in seven states. Administrative and regulatory duties of the chambers are similar to those of the state agriculture offices. The chambers are responsible for education and training tasks and provide advisory services to farmers. According to the expert interviewees, chambers have a strong linkage with vocational education providers and many farmer-based organisations and third sector organisations in the German AKIS. Unfortunately, continuous reduction of public funding for the chambers in recent years has resulted in a decline in the number of advisors and also a change to a fee-based advisory service.

**Private advisory services** can be accessed by any farmer at any time and in all states of Germany. Therefore, numerous private companies - ranging from individual freelancers to larger companies with a wide range of clients - provide advisory services to farmers. In principle, private advisory companies provide similar tasks and services as that of chambers and states but only on a commercial basis. Agricultural advisory companies play a key role in the eastern German states, where advisory service is mainly privatised. Also, in the other states with public services or chambers, the number of private advisors contracted by farmers' own finances is rising. According to our interviewees, private companies, particularly those in eastern Germany, cooperate with other AKIS actors such as state research institutes, chambers, vocational schools and the industry in manifold issues and ways. Our interviewees also highlighted that private advisory services are limited to the services that farmers are willing to pay. Therefore, private companies cannot offer advice on important and relevant topics such as nitrogen balancing.

**Upstream and downstream companies**, e.g. companies providing agricultural inputs or processing agricultural products, also engage in agricultural knowledge exchange. For example, our interviewees expressed the key role that the German Raiffeisen Association (DRV<sup>8</sup>), a private company, plays in agricultural knowledge exchange. The DRV represents the interests of the cooperative-oriented companies in the German agricultural and food industry. There are 1,984 DRV member companies in the production, trading and processing of plant and animal products. Members of the DRV include farmers, gardeners and winemakers (DRV, 2020). The DRV is known to work directly with farmers and deliver advisory services.

There is a broad range of actors who belong to **farmer-based organisations (FBO)**, as with the private sector; to give an overview of all FBOs in Germany is therefore impossible. Also, the boundaries between private organisations and FBO are often fluid, which makes it hard to separate one from another. For example, an advisory circle may work as a non-profit farmer association or as a partly or fully commercialised advisory company.

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<sup>8</sup> *Deutscher Raiffeisenverband*

**The German farmers' association (DBV<sup>9</sup>)** is one example of FBO at the national level, with the major aim of representing farmers' interests in the society, but also actively involved in providing advisory and knowledge exchange services. The DBV represents the most dominant lobby group of farmers in Germany. It has traditionally played a key role in the agricultural sector and is well connected with other lobby organisations and the public sector. The DBV's organizational structure can be observed at three governance levels: at the local (district) level, the farmers' association provides a forum for exchange, opinion building and mutual support. It serves also for representation of farmers' interest towards regional administrative bodies. The second level is the state farmers' association that provides information, advice and services for all local level groups, individual advice for farmers on selected topics and maintains linkages with the state level actors such as chambers of agriculture, ministries etc. At the national level, the DBV operates as a professional interest organization with a broad range of activities and services and manifold links to national and international, in particular EU political fora.

Also, the DBV has a close link with the German Rural Women's Association (DLV<sup>10</sup>). The DLV represents women who live in the countryside and their families. Roughly half a million rural women are members of DLV (DLV, 2020). Given that female farmers make up only about a third of DLV-members, DLV can be regarded more broadly as a lobby group of rural female actors, rather than solely farmer-based. The DLV recognises itself as an important educational actor for rural women.

Besides DBV, farmers, particularly those engaged in smallholder and ecologically oriented farming, are represented by other associations, for instance, the 'working group for smallholder farming' (ABL<sup>11</sup>). The ABL is an association which represents smallholder and organic farming interests and engages in knowledge exchange on ecological, agro-policy and development related topics. Most ABL members are concentrated in the "old" Länder. The ABL has supported smallholder and organic farmers' interests since the 1970s.

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<sup>9</sup> *Deutscher Bauernverband*

<sup>10</sup> *Deutscher Landfrauenverband*

<sup>11</sup> *Arbeitsgemeinschaft bäuerliche Landwirtschaft*

The **association of agricultural chambers (VLK<sup>12</sup>)** primarily acts as an overarching association representing the interests of the seven agricultural chambers' in Germany. Also, VLK provides a nationwide networking platform for experts from the agriculture chambers, state agricultural administrations, farmers' associations and professional advisory service providers to exchange on agricultural knowledge. The VLK has a cooperation agreement with the state ministries for agriculture advisory activities. Through its working group for agriculture advisory services, the VLK coordinates and moderates around 40 committee meetings per year with experts from all agriculture areas.

There are many **professional associations** and **NGOs** that represent agricultural interests at national, state and local levels in Germany. Most of the associations and NGOs represent their members' interest at the local level through district associations. In this report, we only mention some associations that represent professions of the agriculture sector and act as lobby groups and knowledge exchange platforms at the national level. Examples of such associations are described briefly in the following:

- **The association of agricultural producers, processors and retailers of organic foods in Germany (BÖLW<sup>13</sup>)** is an umbrella association that unites 14 member associations along the entire value chain in the field of organic agriculture. Associations such as Bioland, Demeter and Naturland are BÖLW's members. The members interact with actors in various spheres of the agriculture sector, which includes advisory service to farmers, product certification, policy discussions and bridging research and practice. BÖLW's main objective is to create a favourable framework for the further development of the organic food industry in Germany by serving as a platform for open communication and knowledge exchange and joint decisions among its members.
- **The International Academy for Rural Advisory Services (IALB<sup>14</sup>)** plays an important role in the further training of advisors. Originally founded by German-speaking advisors (from Germany, Austria, South Tyrol and Switzerland), it offers services for around 700 individual members from 18

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<sup>12</sup> *Verband der Landwirtschaftskammern*

<sup>13</sup> *Bund Ökologische Lebensmittelwirtschaft*

<sup>14</sup> *Internationale Akademie für ländliche Beratung*

different European countries and 15 corporate members (IALB, 2012). In Germany, IALB members consist of public agricultural advisory organisations, private advisory companies and individual advisors. The association engages in the advancement and support of rural and agricultural advisory services by organising and conducting professional training for advisors. IALB developed the program Certificate for European Consultants in Rural Areas (CECRA) to organise and standardise the various qualification approaches of the federal states under one umbrella. In 2015, the EUFRAS (European Forum for Agricultural and Rural Advisory Services) started cooperating with IALB to extend the CECRA courses to non-German speaking European countries and improve the qualification of rural advisors (EUFRAS, 2015). In addition, through its well-established annual conferences on topical advisory issues, IALB offers its members an important networking platform and acts as a source of knowledge.

- **The German Agricultural Society (DLG<sup>15</sup>)** is another powerful actor with more than 27,000 members (DLG, 2020). Of those members, roughly two-thirds are farmers, while the rest comprises of upstream and downstream companies, agricultural advisors and scientists. The DLG regards itself as an open network and the professional voice of agriculture, agribusiness and the food sector. The network aims to advance technological and scientific progress in crop production, farm machinery, and animal husbandry (mainly on a commercial base). The testing centres, the exhibition departments, and the DLG academy are particularly noteworthy activities of the society. DLG produces and disseminates knowledge within the organisation and beyond, e.g. in the form of printed and online-published bulletins, trade fairs and exhibitions. Farmers, advisors and other agricultural actors pay membership fees to participate in professional events that function as sources of knowledge exchange and networking platforms for farmers, advisors, scientists and up-and-downstream enterprises. Although DLG is a powerful actor in German agriculture, it represents only the top 10% of Germany's farmers (interview communication).

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<sup>15</sup> *Deutsche Landwirtschaftsgesellschaft*

- **The federal association of agricultural training (vlf<sup>16</sup>)** is a farmer-driven organisation with ‘continuous training for farmers’ as their main focus and with about 200,000 farmers as members nationwide. The association is represented nationwide with 13 member associations in the respective states. Members of the association consist of farmers who graduated from one- or two-year technical schools, technical colleges and universities in the agricultural sector as well as actors from other associations such as DBV. According to our interviewees, the vlf plays a central role in shaping the policy in agricultural vocational education and training in Germany and works closely with the state ministries and chambers of agriculture to supervise and monitor vocational education quality.

### Knowledge flows among AKIS Actors

According to our interviewees, in the German AKIS, the state level knowledge flows between associations and farm enterprises is reportedly strong. Similarly, the knowledge flows between chambers and farm enterprises as well as between research and DBV is perceived as strong. In contrast, direct knowledge flows from research to practice is perceived as weak. Importantly, the varying administrative structures in the German states were raised as challenging situations for smoother knowledge flows among the states. The EIP operational groups or similar initiatives are perceived as solutions to strengthen the knowledge flows between research and practice and among the states, according to our interviewees.

The AKIS diagram (see Figure 1) represents the main organisational types and some examples of agriculture organisations of national importance. An earlier version of the diagram was used as a discussion tool for the semi-structured interviews to visualise interviewees’ perspectives on the German AKIS, linkages and knowledge flows among the various AKIS actors. Based on the inputs from the interviewees, the diagram was adapted to its current version.

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<sup>16</sup> *Bundesverband Landwirtschaftlicher Fachbildung*

## Schematic diagram of the main actors and knowledge flows in the German AKIS

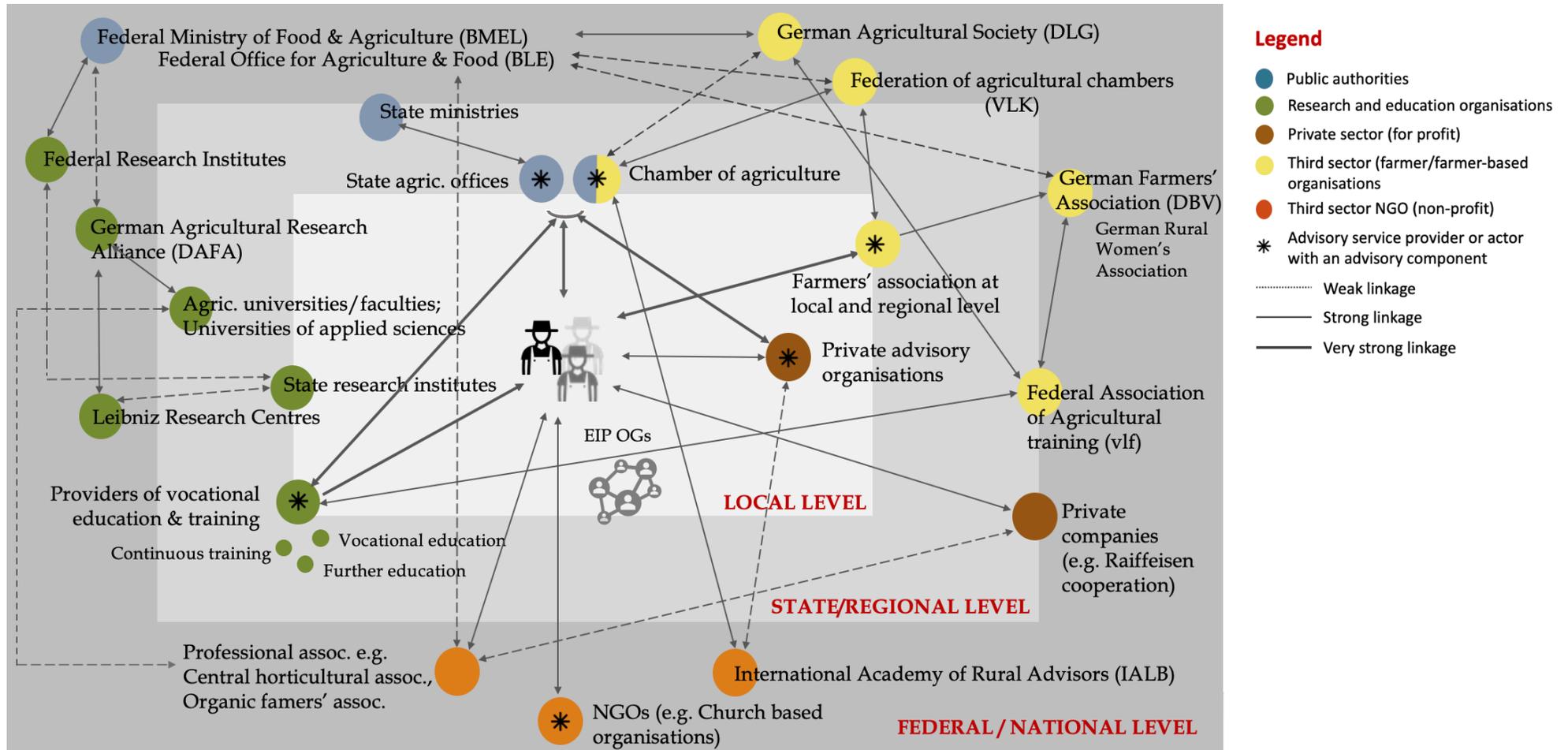


Figure 1 The German AKIS at the national level

## 2.1.2. Examples of state-levels AKIS in Germany

To showcase the heterogeneity and diversity of the German AKIS among the various states, we present two examples of state level AKISs: one of Schleswig Holstein and the other of Bavaria.

### **Schleswig-Holstein**

Schleswig-Holstein is a relatively small state in the north with shipyards, pharmacy and tourism as main sectors. The relative importance of agriculture for the GDP is a little bit higher than the German average. There are ca. 15.000 farms, half of them are full-time farms with an average size of 100 hectares. The strength of the sector is reflected in well-developed and diversified AKIS actors. In the last ten years, the campus Osterrönhof, Rendsburg, related to the agriculture department of the Kiel University of Applied Science, has become a focal point of the agricultural economy in Schleswig-Holstein and the seat of many institutions and associations. The Chamber of Agriculture moved from Kiel to Rendsburg into a new building ten years ago. Together with multiple associations and institutions, which were already there or followed, Rendsburg became a central agricultural hub. Here, the agricultural school, technical college, DEULA, chamber of agriculture, farmers' association, further producer and professional associations, as well as various advisory rings and agricultural advisory companies, are found in one building or in close proximity. Figure 2 below shows the main AKIS actors in Schleswig-Holstein and the knowledge flows among them.

In the small federal state of Schleswig-Holstein, where distances are short, many actors in the agricultural, food and forestry industries know each other well, and some even personally, for instance as alumni from their times as apprentices or students. In the past decades, good structures that promote close cooperation, which are helpful for networking, knowledge exchange and creating innovations have been created.

The Chamber of Agriculture plays a key role in the state by maintaining close links with all important actors and offering a platform to state level associations and advisory organisations. Farmers in Schleswig-Holstein are highly educated and a large percentage of young farm managers have graduated from an agricultural

university, or a university of applied sciences, or a technical college. Also, farmers have good linkages with research and training institutions in the state.

Since 2014, the European Innovation Partnership (EIP-AGRI) initiative has made it possible for actors from key organisations in agriculture and nature conservation to collaborate in 30 innovation projects. By working together in such projects, the linkages among farmers, advisors and researchers are strengthened through repeated communication and cooperation. As a result, trust has developed and close thematic working groups have been established. Nevertheless, there is still a need to strengthen contacts for stable and reliable networks to intensify innovation. Moreover, start-up initiatives in the agriculture, food and forestry sector, which is still low in Schleswig-Holstein compared to e.g. the neighbouring Lower Saxony, need to be promoted.

## Schematic diagram of the main actors and knowledge flows in the Schleswig-Holstein AKIS

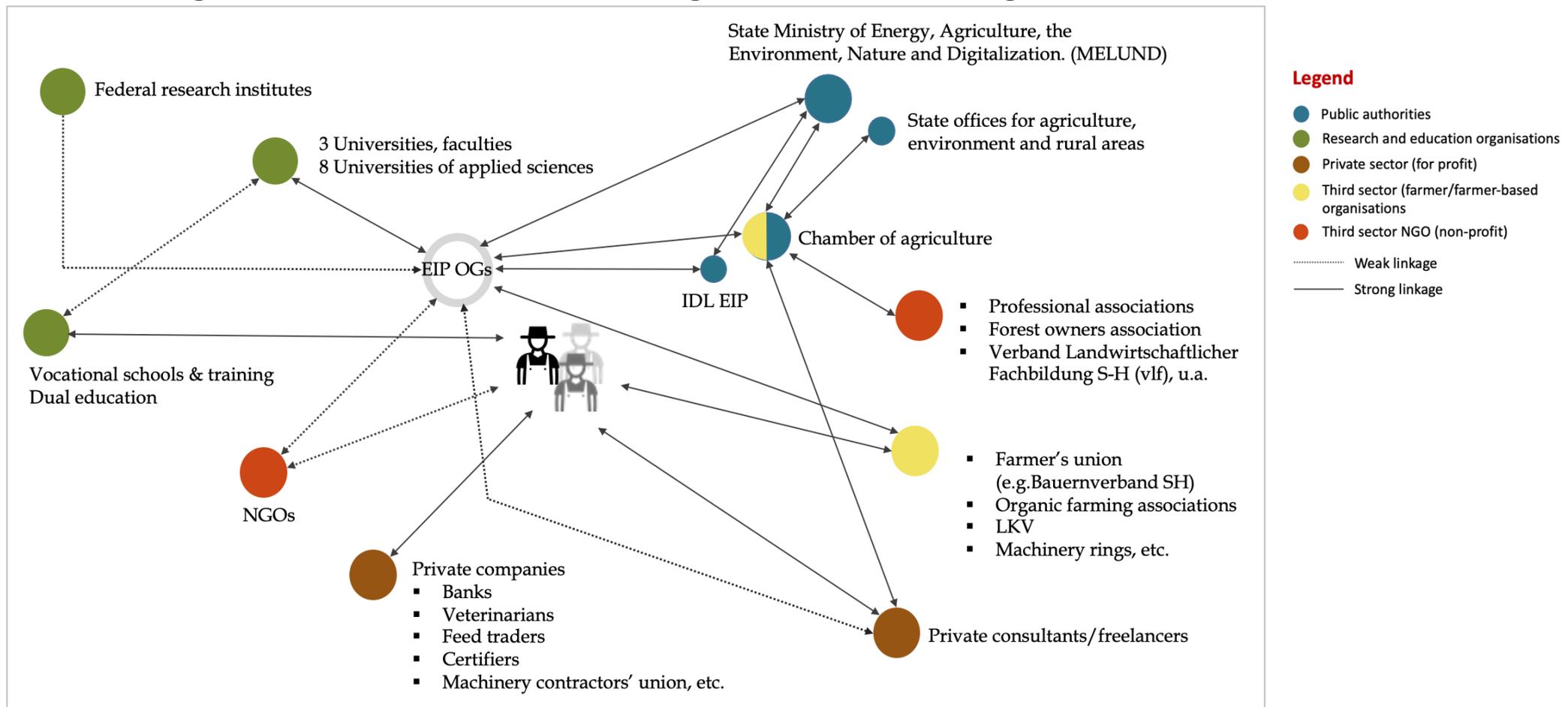


Figure 2 The Schleswig-Holstein AKIS

## **Bavaria**

The AKIS in Bavaria, characterised by a dense infrastructure comprised of a high number of public actors and various professional organisations and associations, gives an overview of the agricultural actors involved in innovation and knowledge transfer. This structural performance corresponds to the important role that agriculture plays for the rural areas in Bavaria: with roughly 90,000 farms, the state hosts almost one third of all German agricultural enterprises (Brechmann et al. 2015).

Similar to Schleswig-Holstein, Bavaria has a long tradition of agricultural production. In Bavaria, agricultural education and training and applied research are mainly under the responsibility of the State Ministry of Food, Agriculture and Forestry (StMELF). The Offices for Food, Agriculture and Forestry (ÄELF), which coordinate advisory services as well as advanced and further training, play a key role in knowledge transfer. In the case of supra-regional issues or highly specialised topics, various bodies of the state institutes and technical colleges collaborate. Concerning vocational education in Bavaria, young professionals in agriculture and home economics gain their knowledge via the dual system, or the Farmer's Training Programme (BiLa), or the master craftsman qualification. Prominent agricultural education institutions in Bavaria are the agricultural and home economics technical colleges or higher agricultural and technical colleges such as the Weihenstephan-Triesdorf University of Applied Sciences and the Technical University of Munich.

Advice for agricultural enterprises in Bavaria is dominated by state agricultural advisory organisations in collaboration with non-governmental advisory organisations. The cooperative farm advisory services scheme ('Verbundberatung') regulates the cooperation of recognised, non-governmental advisory service providers with the state advisory services. The collaborative farm advisory services do not cover all areas of advice relevant to agricultural and forestry holdings or to farm managers. Therefore, the gap is covered by advisory service from providers such as networks and associations like the Farmers' association (DBV) and the federal association of agriculture training (vlf)). Also, actors from business and industry contribute in the advisory service provision. Figure 3 below illustrates the AKIS actors and the knowledge flows in Bavaria.

## Schematic diagram of the main actors and knowledge flows in the Bavarian AKIS

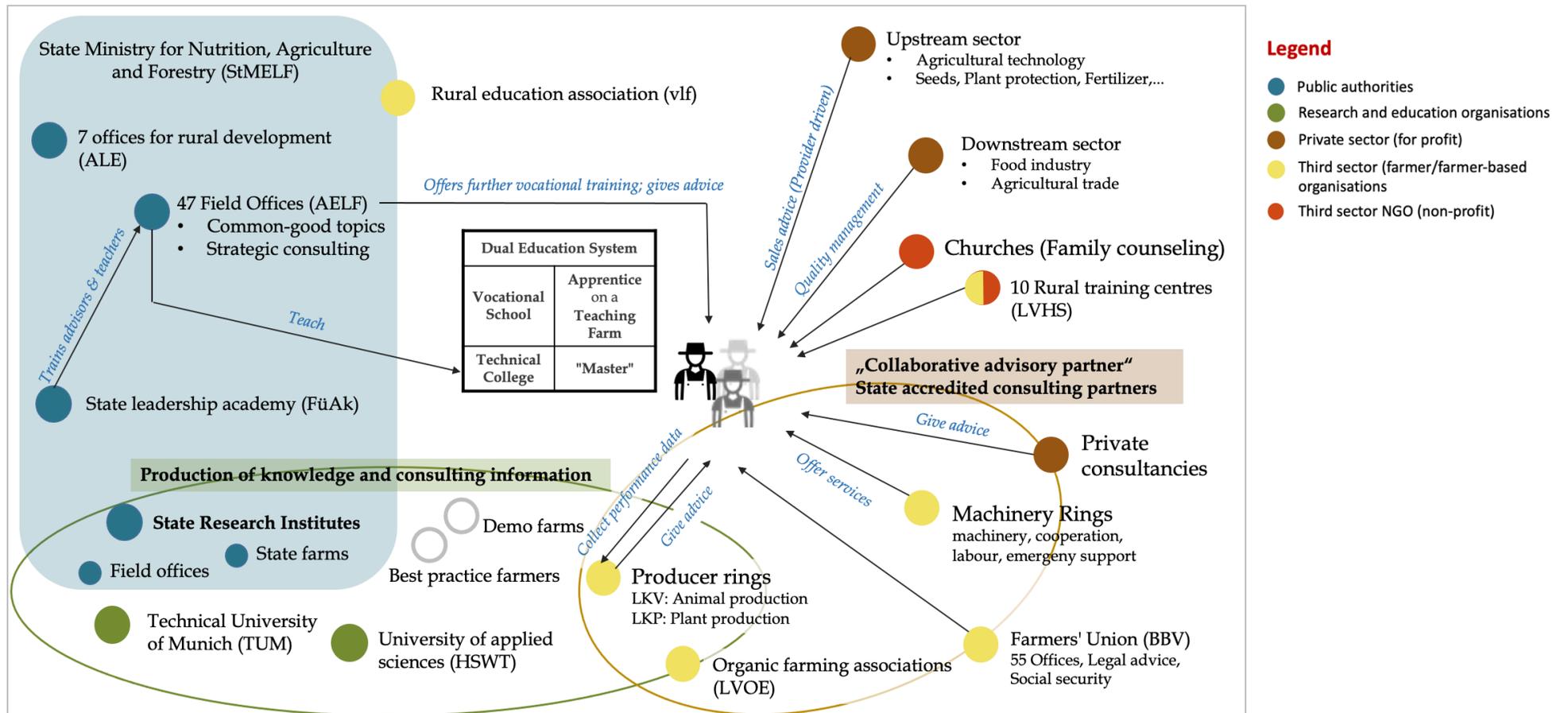


Figure 3 The Bavarian AKIS

### 2.1.3. Forestry Knowledge and Innovation System (FKIS) in Germany

The forest knowledge and innovation system (FKIS) is equally complex and heterogeneous in Germany as the AKIS. Forest governance lies within the mandate of the individual federal states, with the federal government only taking on the role of coordinating the activities of the states and setting the legal framework for sustainable forest management through the Federal Forest Act (Bundeswaldgesetz). The diversity of the forest structures and the relative importance of forestry in each state also means that different policies exist in the individual federal states (Haußmann and Köhl 2018).

The illustration of forestry actors at the national and the state level using the FKIS concept is relatively new for the sector. This was affirmed by our interviewees who mentioned that the German FKIS is independent of the AKIS and little is known about the linkages and cooperation of the diverse actors operating in the forest sector. To this end, the BMEL is in favour of setting up a coordination unit, similar to DAFA for the forest sector. One already existing structure is the FNR (Fachagentur Nachwachsende Rohstoffe) that is responsible for the forestry and renewable energy topics at the federal level.

In terms of main actors, forestry schools and forestry training centres run by the federal states play an important role in the FKIS. The forestry schools provide standard, advanced and further training courses for foresters, master foresters, and forest owners. The forestry schools and forestry training centres are run by the respective forest administration offices or state forest enterprises. At the national level, the Lohr State Technical School offers training for foresters, master foresters and forest owners.

The Federal Research Institute for rural areas, forestry and fisheries is dedicated to forestry research in Germany. Another key actor in research is the Board of Trustees for Forest Work and Forest Technology (KWF<sup>17</sup>). KWF addresses forestry technology topics, particularly those within the supra-regional context. The KWF has been operating for more than 50 years in Germany with 2500 members from

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<sup>17</sup> Kuratorium für Waldarbeit und Forsttechnik

practice, science, administration and industry. The KWF is institutionally supported by the BMEL and the ministries of the federal states. Additionally, state forestry research institutes in the respective federal states conduct forestry research.

While state research institutions and universities conduct research to produce knowledge and innovation in forestry, disseminating the results is a role of the state forest offices or forest chambers or private advisors. Moreover, the state forest offices are responsible for organising on-site advisory services and training activities for forest owners in the respective states. The internet-based information platform "Waldwissen.net", managed in collaboration with four forest research institutes in Germany, Switzerland and Austria plays a key role in disseminating findings from forest research institutions to forest owners and the public. Mitigating the massive effects of climate change on forests is one of the primary topics receiving attention by forest actors in Germany.

Concerning third sector actors in the German FKIS, the association of German Forest Owners (AGDW<sup>18</sup>) is an umbrella association covering 13 federal associations. AGDW represents the common interests of private forests owners as well as municipal and corporate forests. Figure 4 below illustrates the FKIS actors and the knowledge flows in Germany.

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<sup>18</sup> *Arbeitsgemeinschaft Deutscher Waldbesitzerverbände*

## Schematic diagram of the main actors and knowledge flows in German FKIS

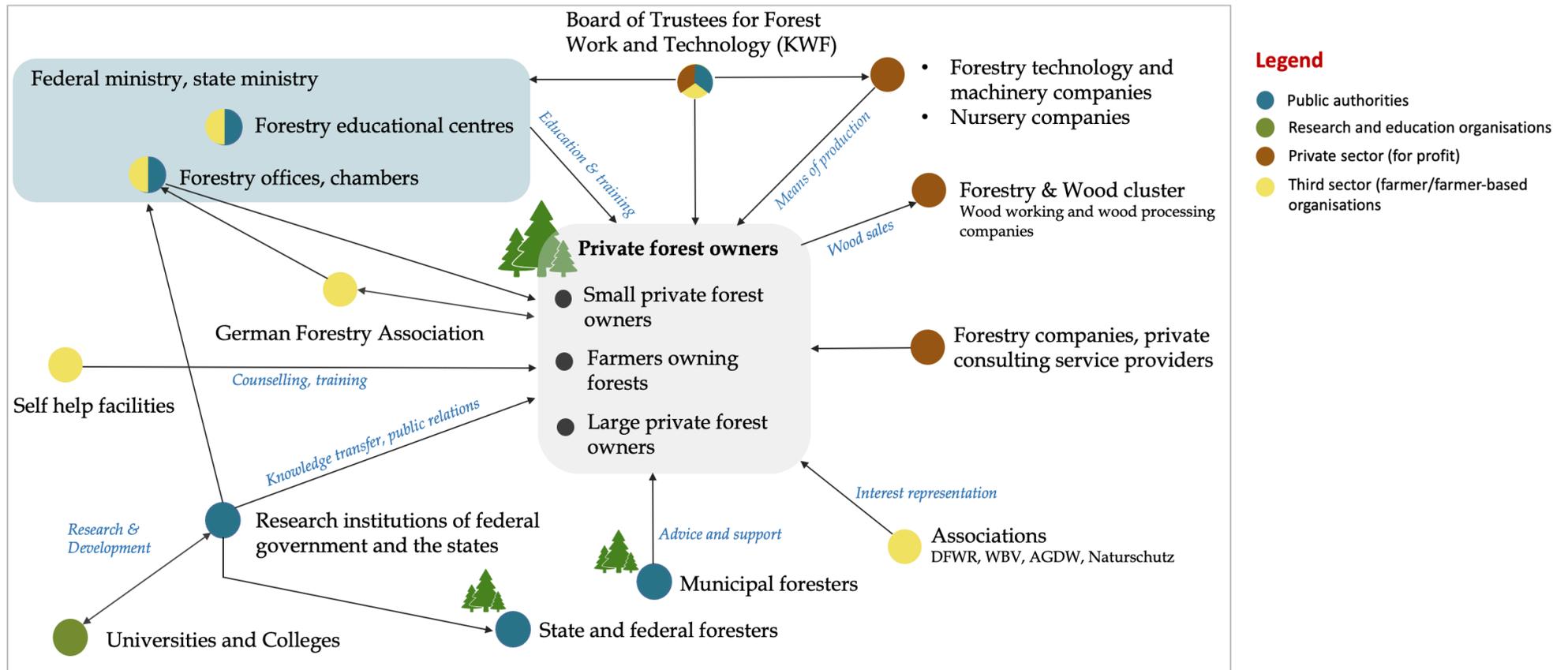


Figure 4 The German FKIS

#### 2.1.4. Example of state level FKIS in Germany

In the state of Bavaria, the State Ministry of Food, Agriculture and Forestry (StMELF) and its subordinate bodies are responsible for coordinating and overseeing the vocational education, advisory service and applied research on forestry. The Forestry College Lohr and the Lohr State Technical College provide standard and advanced vocational training. Courses take place at the School of Silviculture and at the training centres of the Bavarian state forestry company (BaySF).

Applied research is conducted by the Bavarian State Institute for Forestry and Silviculture (LWF) and the Office of Forest Genetics (AWG). Also, universities collaborate with the institute through projects. One such example is the Centre of Forestry Weihenstephan (ZWFH) which is a unique competence centre for forests in Europe. ZWFH brings together three institutes: the LWF, the Technical University of Munich and the Weihenstephan University of Applied Sciences to cooperate in the generation of forestry related knowledge and innovation. ZWFH combines basic research, applied research, education and consultancy for the entire forest sector and acts as an interface between science and practice (ZWFH 2020)

In Bavaria, advice to forest owners and on-site training activities are primarily the responsibility of the Forestry Division at the Offices for Food, Agriculture and Forestry (ÄELF). These offices cooperate with the private forestry associations (FZuS) as self-help institutions for private forest owners. Advice is free of charge for forest owners with an area of less than 200 hectares. Dissemination of knowledge from research institutions and universities is taken up by the advisors at the state authorities as well as teachers, forest owners and the public. Figure 5 below illustrates the FKIS actors and the knowledge flows in Bavaria.

## Schematic diagram of the main actors and knowledge flows in the Bavarian FKIS

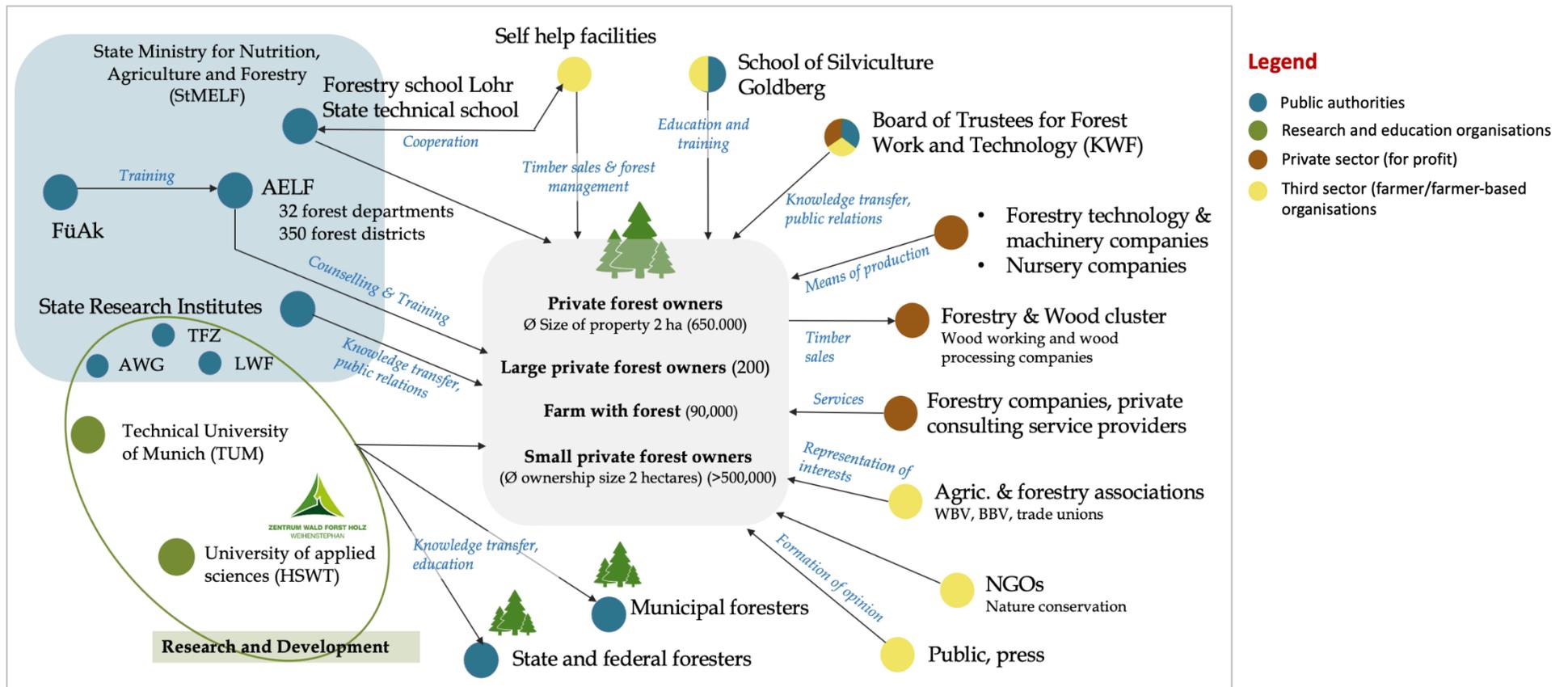


Figure 5 The Bavarian FKIS

## 2.2. Policy framework at national level

The federal ministry of food and agriculture (BMEL) is responsible for providing the framework and guiding principles for the agricultural sector, e.g. by setting policies and incentives through funding programs. Several national policies set the frame and guide the German agricultural sector's overall direction and rural areas' development. One big policy programme is the Joint Task for the Improvement of Agricultural Structures and Coastal Protection (GAK<sup>19</sup>). The GAK, ongoing since 1973, is the most important national funding instrument to support agriculture and forestry, the development of rural areas and to improve coastal and flood protection. Together with the states' funds, the total budget of the GAK amounts to around 1.9 billion euros per year (BMEL, 2020b). BMEL finances 60%, while state governments cover 40% of the GAK budget. According to our interviewees, financing shares between the federal government and the states are sometimes adjusted upon negotiations.

Moreover, the BMEL initiates specific programs that are purely implemented by BLE without the states' engagement. These programs aim to support research projects and promote innovation and knowledge exchange. Some of such programs are:

- **The programme for the promotion of innovation** that aims to support the competitiveness of the German agricultural and food industry. Through this programme, collaborations between small and medium-sized companies and research institutions are promoted to efficiently tap into innovative ideas;
- **The Federal programme for Organic Farming and Other Forms of Sustainable Agriculture Programme (BÖLN<sup>20</sup>)** that aims to promote organic farming as a pioneering form of agricultural use. The BÖLN implements the exchange of knowledge at an early stage of research funding. BMEL puts about 30 million euros for BÖLN;

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<sup>19</sup> *Gemeinschaftsaufgabe Agrarstruktur und Küstenschutz*

<sup>20</sup> *Bundesprogramm Ökologischer Landbau und andere Formen nachhaltiger Landwirtschaft*

- **The support program for renewable raw materials (FNR)** that aims to further develop a sustainable bioeconomy and open up new perspectives for Germany as an industrial location and develop the rural areas.
- **The German Agricultural Innovation Partnership (DIP<sup>21</sup>)** that aims to strengthen agricultural innovations by providing funding for research and development projects with high practical relevance. The funding is aimed at commercial companies eligible to apply alone or in association with other industry or science partners. Member organisations of DIP include public authorities, third sector associations and research organisations. The members meet regularly to propose projects for funding and discuss the eligibility of funding.
- **The Future Program of digital agriculture policy** that aims to support projects that use digital technology to improve living and working in rural areas. Through this program, the BMEL is planning a comprehensive data platform for farmers.

Moreover, policy programs that directly target federal states, such as EAFRD and EIP-AGRI are worthy to note. The money from the European Agricultural Fund for Rural Development (EAFRD), goes directly to the states' rural development programmes. Responsibility of managing EAFRD funds lies solely on the state ministries (BMEL, 2019). The other policy program, the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP AGRI), supports collaboration and knowledge exchange among farmers, scientists, consultants and associations to implement innovative projects via the operational groups (OG).

According to our expert interviewees, although the policy and the programmes are all in place, only a small number of advisors and other relevant AKIS actors are addressed. Possible reasons highlighted were budget constraints and the limited capacity of policy support staff to deal with the many actors in the AKIS.

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<sup>21</sup> *Deutsche Innovationspartnerschaft*

### 2.3. Coordination structures

There are multiple coordination structures in Germany, aiming to make knowledge exchange and innovation processes optimal. The first is the thematic working panel (*Bund-Länder Arbeitsgruppen*), which coordinates exchange between the national and state ministries. Paul, Knuth, Knierim, Ndah, and M. Klein (2014) described the thematic panels as important exchange platforms between the state and national level. Our expert interviewees also corroborated the important coordination role these thematic panels play in exchanging agricultural knowledge and innovation at the national level. However, communication gaps among the states and cross-exchange with different thematic panel members were raised as issues that could be improved.

The second important coordinating body at the national level is the German Federal Agency for Agriculture and Food (BLE). The BLE acts as the executive agency for the BMEL programs. Under the BLE is the German Networking Agency for Rural Areas (DVS) which is a coordination and networking body responsible for coordinating the knowledge exchange and dissemination among EIP-OGs programmes. The BLE initiated an online portal the Research Information System for Agriculture and Nutrition (FISA), in order to provide detailed information on publicly funded research projects in the fields of agriculture and nutrition (FISA, 2020). Furthermore, other coordination structures such as the association of agriculture chambers, vocational training, and the DAFA continue to play a significant role in coordinating agricultural knowledge exchange and innovation.

According to the expert interviews, regardless of the coordination structures in place, the horizontal interplay among German AKIS actors in the various states and subsystems appears rather weak. Similarly, Paul et al. (2014) indicated a low level of cooperation among the state ministries in agricultural knowledge exchange and innovation processes.

### 3. History of advisory services in Germany

Germany has a long history of agricultural advisory service that dates back to the second half of the 19<sup>th</sup> century. However, an institutionalised form of advisory services provision was installed from the 1920s onwards (Hoffmann, Lamers, & Kidd, 2000). Before the unification of East and West Germany in 1990, the agricultural sector policies and strategies focused on higher production for farmers and low cost for consumers. Advisory service in the eastern part of Germany was an integral part of an overall system promoting socialist agricultural development under party and state officials' directions. In the western part of Germany, there were three organisational forms for agricultural advisory services: (i) chambers of agriculture, (ii) public agricultural offices, (iii) Advice circles and farmers' working groups (Paul et al., 2014).

After the reunification in 1990, there was strong support for a fourth organisational form in the eastern states: a private advisory system. Consequently, in the 1990s, German advisory services appeared as one of three types: Chambers of Agriculture in the northwest of Germany and in Saarland, private advisory service providers in the north-east German states and the public/state advisory services in the Southern German states and in Saxony. In addition to the prominent service providers, associations, upstream and downstream industries continued to play a significant role in advisory services.

Since mid- 2000, advisory service provision in Germany has received more political focus and reforms have taken place at national and state levels (Knierim, Thomas, & Schmitt, 2017a). One significant transformation is the trend towards increased pluralistic advisory services. In the pluralistic system, the state's role in specialised and specific advisory services has been reduced. In contrast, the role of the private sector and third sector organisations in specialised topics have increased. Also, for the past ten years, advisory services are regarded as important players in the German AKIS.

The European Fund for Agriculture and Rural Development (EFARD), as part of the CAP 2014-2020, allocates funds for advisory services and knowledge transfer for each federal state. According to Knierim et al (2017a), the co-financing from the EFARD funds has significantly contributed to the expanding advisory service offers in the German federal states.

## **4. Agriculture and forest advisory service providers**

This section is based on the review of policy documents, published and grey literature, expert interviews, and the online survey results on the German advisory service providers. The survey is not representative of the advisory service providers in Germany. However, it gives structured situational insights by providing information about the type of advisory organisations, topics and methods of advice, and advisors' qualifications and experience of the participating advisory actors.

### **4.1. Overview of all service providers**

The federal states are responsible for coordinating and providing agriculture and forestry advisory services in their respective states. While Berlin and Brandenburg states have a common advisory service structure, the other states possess independent advisory services. Based on the typologies of advisory service providers presented in the i2connect conceptual background report (Knierim et al., 2020), four types of advisory service providers that prevail in the German states are summarised in Figure 6. In reality, however, there is a pluralism of actors that offer services, and no single typology exists distinctively in any of the states. Also, various third sector organisations such as farmer associations and NGOs offer advisory services at the local level throughout the country, but only in a limited scale or a smaller geographical location.

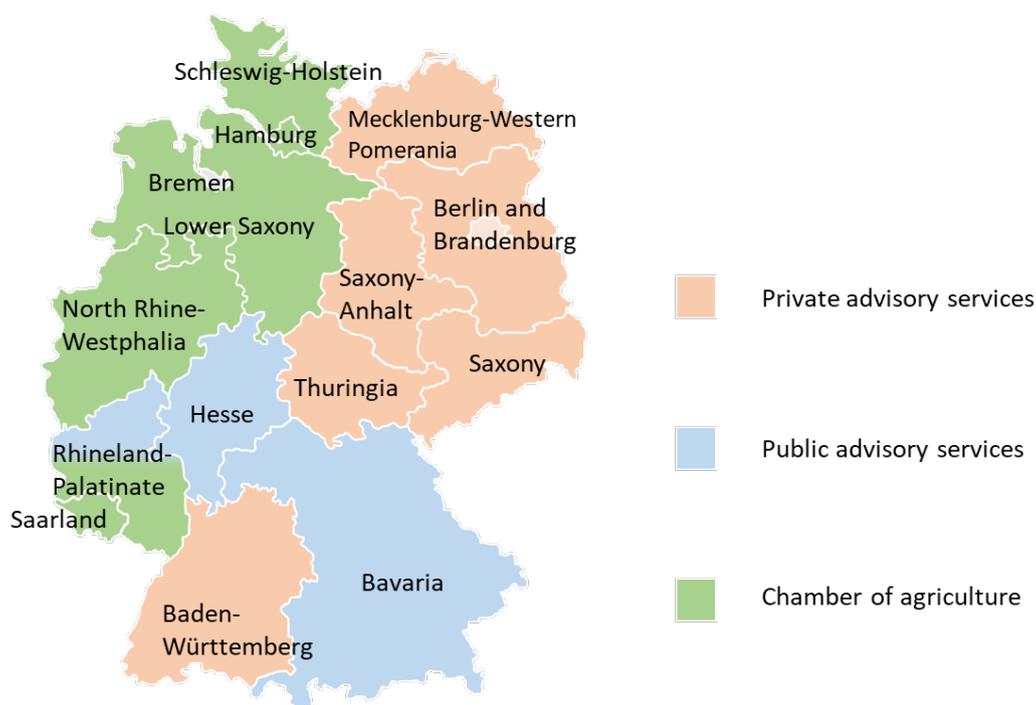


Figure 6: Dominant type of advisory service providers in the German states

To assess the advisory service landscape for agriculture and forestry enterprises, we conducted an online survey between October and November 2020. The questionnaire invitations were distributed to advisory organisations and individual freelance service providers via contact persons in all federal state ministries and chamber of agriculture offices. Additionally, the invitations were sent out to all IALB network members in Germany. A total of 50 complete questionnaires were received from individuals who identified themselves as representatives of advisory organisations (20) or organisations with advisory components (17) or as freelance advisors (13) (Figure 7). The majority of respondents (23 out of 50) were from two German states, Baden Württemberg and Bayern, and some states were represented by just one respondent.

**Distribution of survey respondents**

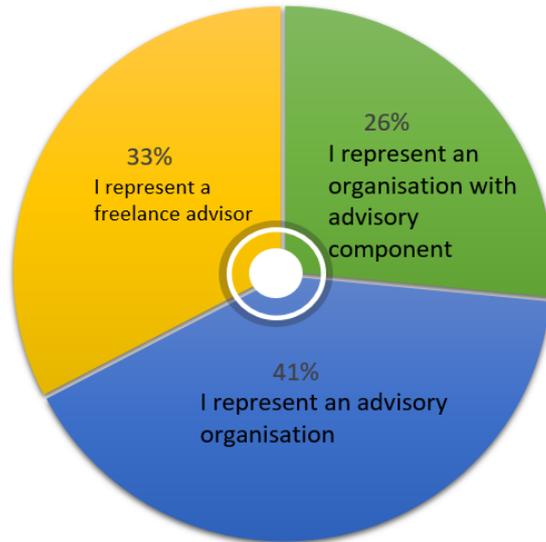


Figure 7: Distribution of survey respondents (n=50)

The respondents with an organisational affiliation identified themselves as representing a FBO, NGO, Government or ministry-based organisation, private/commercial advisory organisation or university (**Error! Reference source not found.**). For simplicity of data analysis, freelancers were included into the category of private/commercial advisory organisations, thereby constituting private companies (10 out of 50) and freelancers (13 out of 50). The freelancers included those who provide advisory services full-time (10 out of 13) and part-time (3 out of 13). In addition, a few respondents (4 out of 37) identified their organisations as one with mixed affiliation.

Table 1: Category of organisations represented by the survey respondents

Category of organisations	Number of respondents from the organisation category
Farmer-based organisation (FBO)/Professional organisation	12
Government or ministry based advisory organisation	8
Mixed	4
Non-Governmental Organisation (NGO)	2
Private/Commercial advisory organisation*	23
University-based/Research-based advisory organisation	1
<b>Total</b>	<b>50</b>

\*includes the 13 private freelance advisors who provide service full-time/part-time

From the total survey respondents, 72% (36 out of 50), reported that their organisations offer advisory services at the regional (state/province) level. University and private organisations have a scale of operation at an international level, while FBOs, government organisations and NGOs predominantly operate at the state level.

Advisory organisations and freelancers were found to offer a diverse range of advisory services. The most frequently offered services include consultancy and backstopping, creating awareness and facilitating knowledge exchange, networking/facilitation, and brokerage (Figure 8). According to the results, private advisory organisations were found to offer more services in ‘enhancing access to resources (input, finance)’ compared with the other advisory service providers.

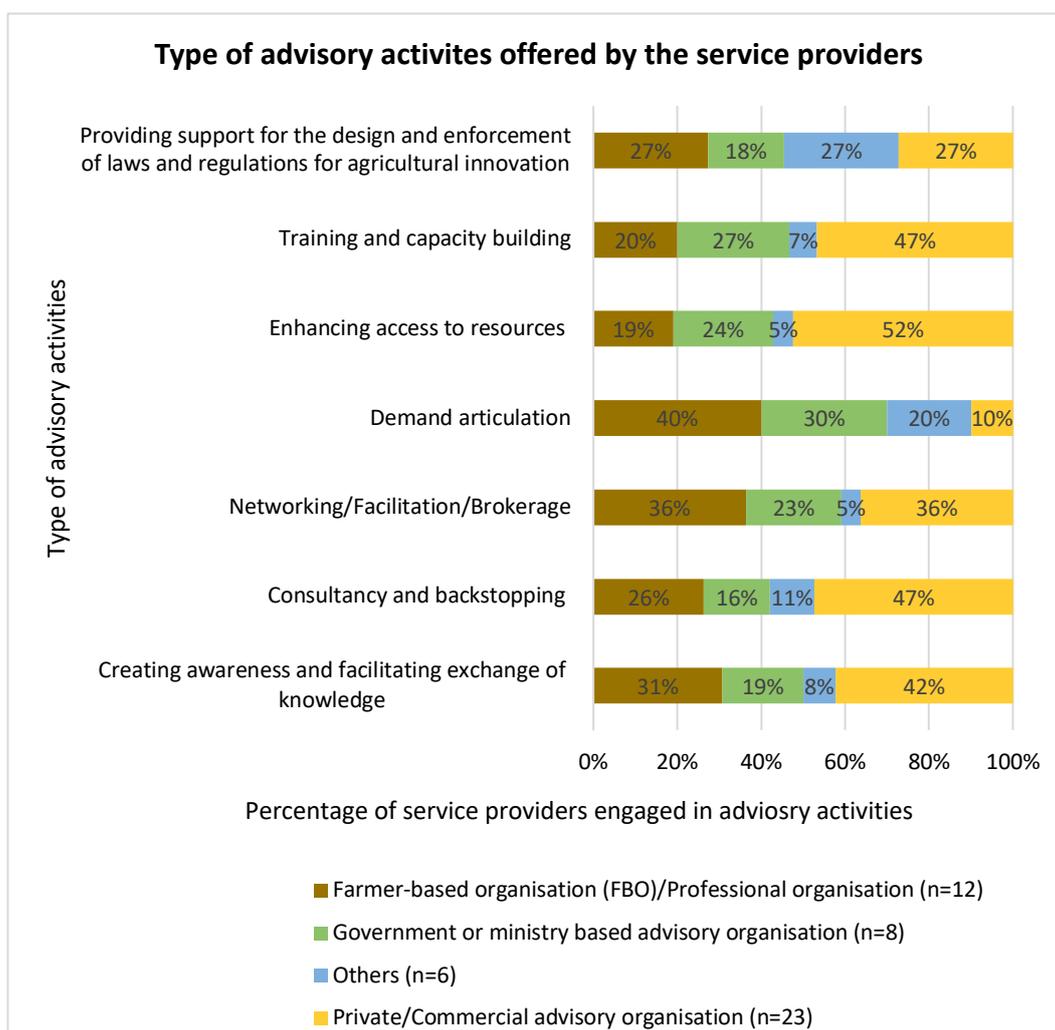


Figure 8: Main advisory activities in the organisations (Multiple answers possible, n= 36)

## 4.2. Public policy, funding schemes, financing mechanisms

In the survey, 65% (22 out of 34) of the advisory organisations reported more than one primary funding source. The other 35% (12 out of 34) reported a single funding source from national or regional governments (7 government organisations), levy (1 private organisation) and membership fee (4 FBOs). While the primary sources of funding are multiple, the proportion of national/regional government funding appears significant in all the organisations (Figure 9). Source of the national/regional government funds in Germany include funds from the federal

government and the EAFRD funds allocated for advisory service provision (Knierim et al., 2017a)

Changes in the annual budget for advisory services were observed in 29% (10 out of 34) organisations in the last three years. Some respondents mentioned that their organisation’s budget increased due to more customers, higher personnel cost, increased staff number, more projects and higher grants from church organisations. Other respondents mentioned that their organisation’s advisory service budget decreased due to the shift to EU CAP projects and a drop in clients/members.

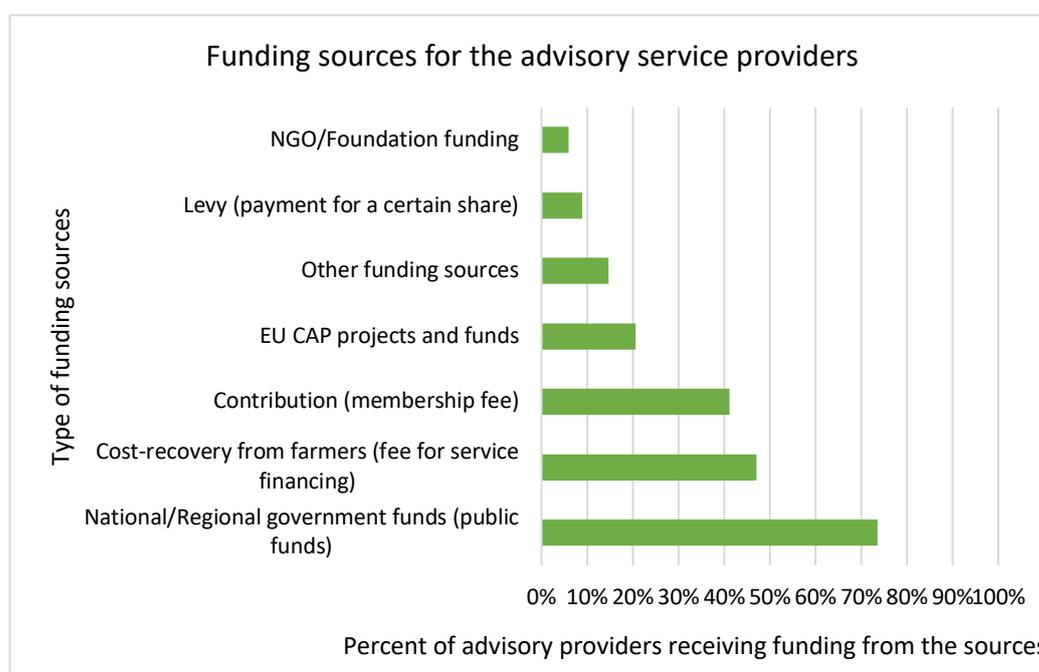


Figure 9: Primary sources of funding (Multiple answers possible)

### 4.3. Human resources and methods of service provision

The total number of employees and the share of women and advisors show a considerable variation among the organisations (see Figure 10). In general, government organisations reported higher numbers of employees and advisors.

As shown in Figure 10, advisors' share is highest in mixed organisations, followed by NGOs and private organisations. Government organisations and FBOs have

lower proportions of advisors, which could be due to the multiplicity of services offered by these organisations. In general, women advisors are well represented in the respective organisations. The percentage of women advisors in government organisations and private organisations is less than in NGOs and mixed organisations.

Advisors' number remained steady in 69% (25 out of 36) of the organizations and 22% (8 out of 36) organizations reported a significant increase. According to the respondents, the increase in advisor number is related to the growing number of organic farms that led to more demand for advisory services, the acquisition of more international projects, and the availability of a wider range of funding programs. In contrast, 8% (3 out of 36) reported a significant decrease due to the country's financial crisis, the decline in clients number, and the emergence of other operational tasks.



Figure 10 Composition of employees in the category of organisations

Regarding back-office activities, 67% (24 out of 36) specified the presence of an employee dedicated to back-office activities in their organisations. On average, every organisation has up to three employees dedicated to back-office activities.

In terms of education level, the survey distinguished five different ones. After controlling for an outlier that reported 400 engineers in a government

organisation, still, a clear majority of advisors (41%) (197 out of 482) holds an engineering degree (5 years), followed by 35% (169 out of 482) with a bachelors degree (3-4 years) and 14% (69 out of 482) with a masters degree (Figure 11). Vocational certification is reported by 4% (20 out of 482) of the respondents, mainly from FBOs and NGOs, as the highest education level.

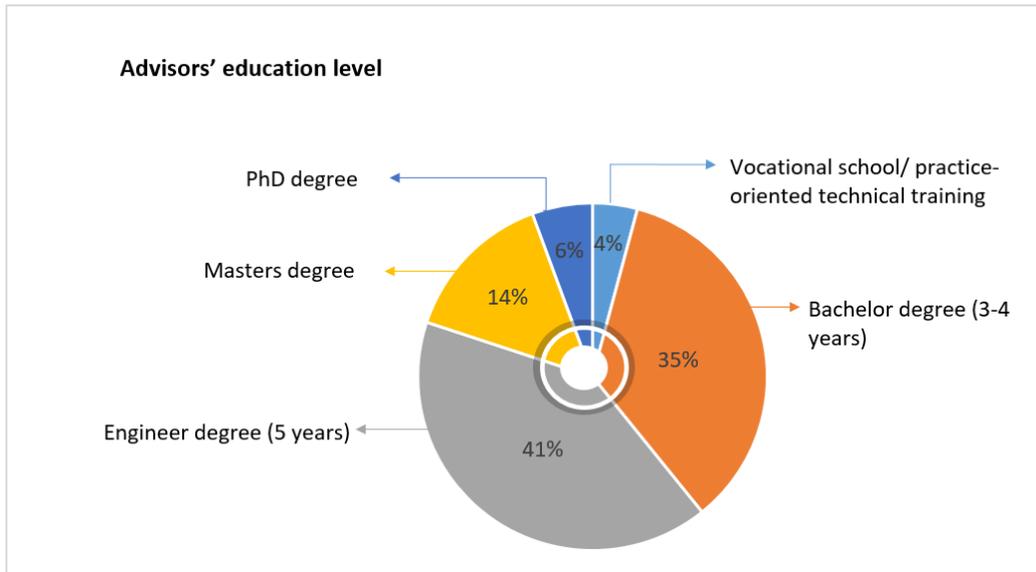


Figure 11: Percent of advisors' education level in all service providers (n=482)

When asked whether additional qualifications (other than education degrees) were required for an individual to serve as an advisor, 56% (20 out of 36) responded yes. The qualifications mentioned include one or two years of training on advisory methodologies (e.g. facilitation, mediation, communication), cross-compliance training, CECRA module certificates, work experiences in advisory service delivery and skills in practical topics such as fruit growing and forestry.

Advisors in 67% (20 out of 36) of the organisations possess advisory certifications in various topics such as cross-compliance, CECRA modules, organic farming, systematic coaching, state certification for consulting approval, ring leader and qualification certification for technical expertise such as plant protection, organic farming and energy advising.

When asked the aggregated years of advisors' professional experience, in the surveyed advisory organisations, 58% (1128 out of 1954) of the advisors have more than ten years of experience, while 30% (582 out of 1954) of the advisors

have 3-10 years of experience, and 12% (244 out of 1954) of the advisors have 0-3 years of professional experience. Similarly, a higher proportion of freelance advisors (85%) (11 out of 13) reported having more than ten years of professional advisory experience. The result indicates a trend in a smaller proportion of young professional advisors joining the sector.

### Methods of service provision

According to the survey results, individual face-to-face advice is the most common method, used in all 49 organisations. Concerning the relative proportion of use, 66% (32 out of 49) responded to use individual advisory methods in more than 80 percent of the time they provide advice. The three individual advisory methods most frequented are face-to-face advice on the farm/enterprise, advice via telephone and individual advice via digital apps (Figure 12).

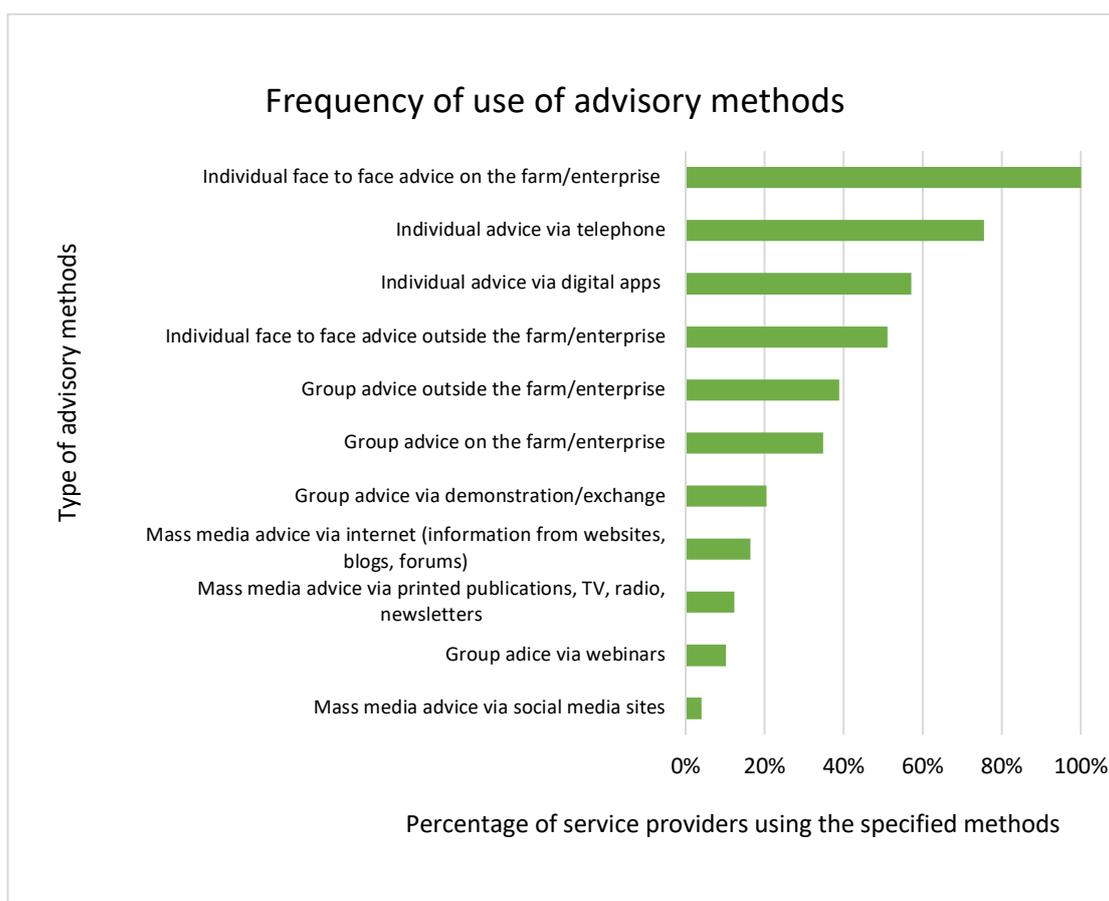


Figure 12: Advisory methods frequented by the advisory organisations (Multiple answers possible)

Changes in the advisory methods used have been reported by 59% (29 out of 49) of the respondents due to the Covid-19 pandemic. According to the respondents, individual face to face advice has been reduced or replaced by telephone or digital advisory methods. Similarly, group advice has been replaced by webinars or video-based consultation and training.

#### 4.4. Clients, topics and content

Conventional advisory service to farmers with small/medium scale farms followed by farmers with large commercial farms appears more pronounced compared to targeted advice to farm workers or new entrants (Figure 13). Some FBOs, government-based advisory organisations, and private advisory organisations reported to also provide advisory service to full-time/part-time forest owners. In contrast, the freelance advisors who participated in the survey served clients exclusively from the agricultural sector.

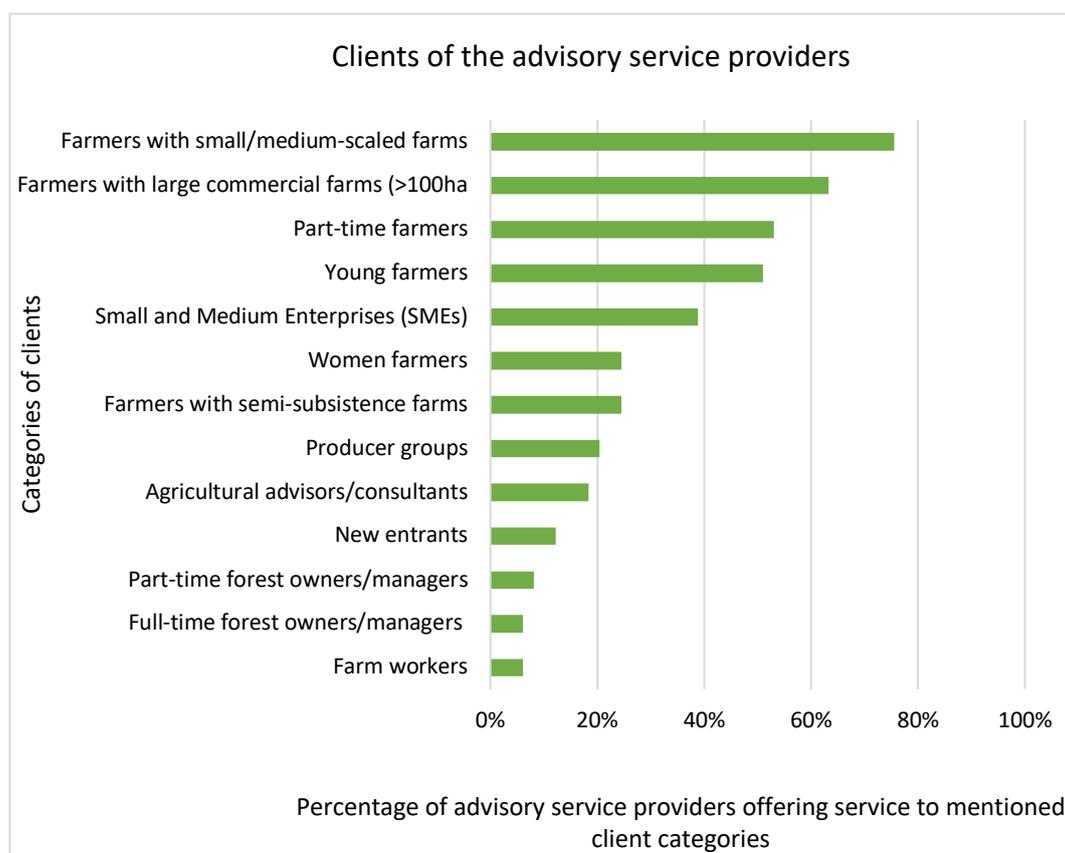


Figure 13: Clients of advisory service providers (Multiple answers possible)

According to the survey results, the public advisory organisations and the mixed organisations have the highest number of clients that contract their advisory service with some as high as 300,000 clients per year. In contrast, private organisations and freelance advisors have relatively fewer number of contracts with farm enterprises. This trend might be attributed to the capacity of the organisations and the history of the organisation in service provision.

### Cross-cutting and specific advisory topics

The advisory organisations offer a diversity of advisory topics to their clients. Cross-cutting topics such as entrepreneurship and farm management, support with the grant application and agri-environmental stewardship measures and nature protection are reported as the most frequently offered advisory topics (Figure 14). Specific entrepreneurship topics offered by the organisations include business administration, organisational development, business start-ups, farm cafes, finance, investment promotion, and income diversification.

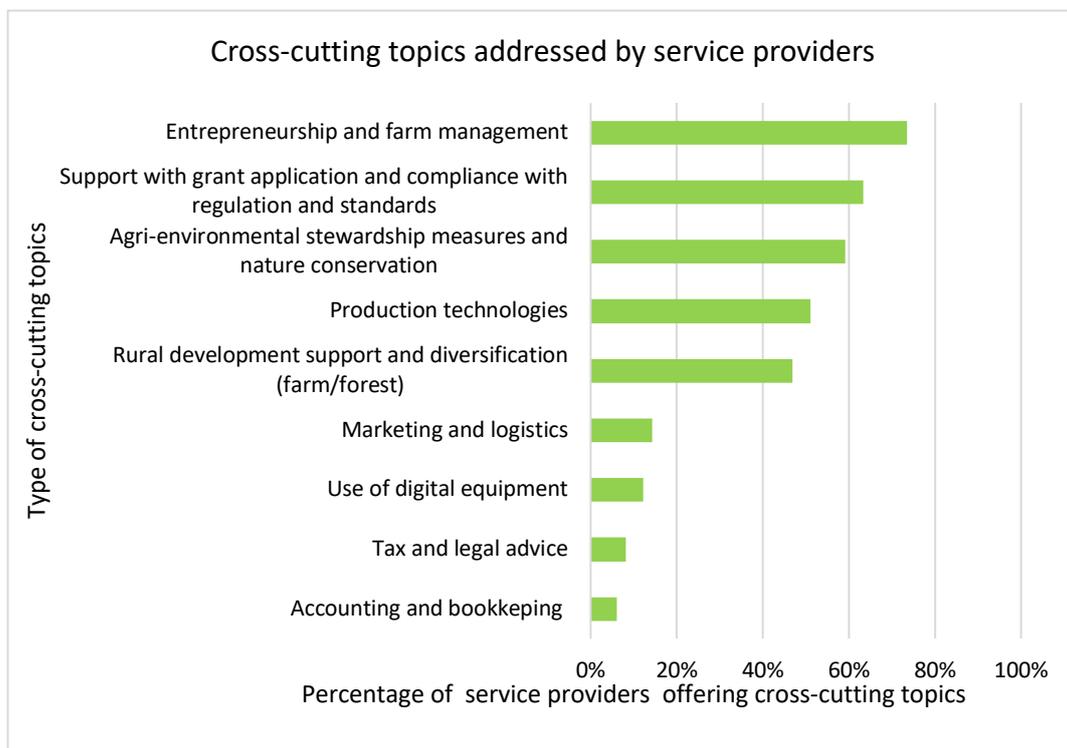


Figure 14: Cross-cutting topics addressed by service providers

Moreover, specific advisory topics such as crop production, livestock production, farm machinery and building constructions are frequently provided by the advisory organisations, predominantly by FBOs, government organisations and private organisations. Non-government organisations mainly focus on cross-cutting topics rather than specific advisory topics. Of the total 49 survey respondents, 41 reported providing advice on specific advisory topics, while eight reported their focus on only cross-cutting advisory topics. Figure 15 shows the relative proportion of specific advisory topics provided by all respondents.

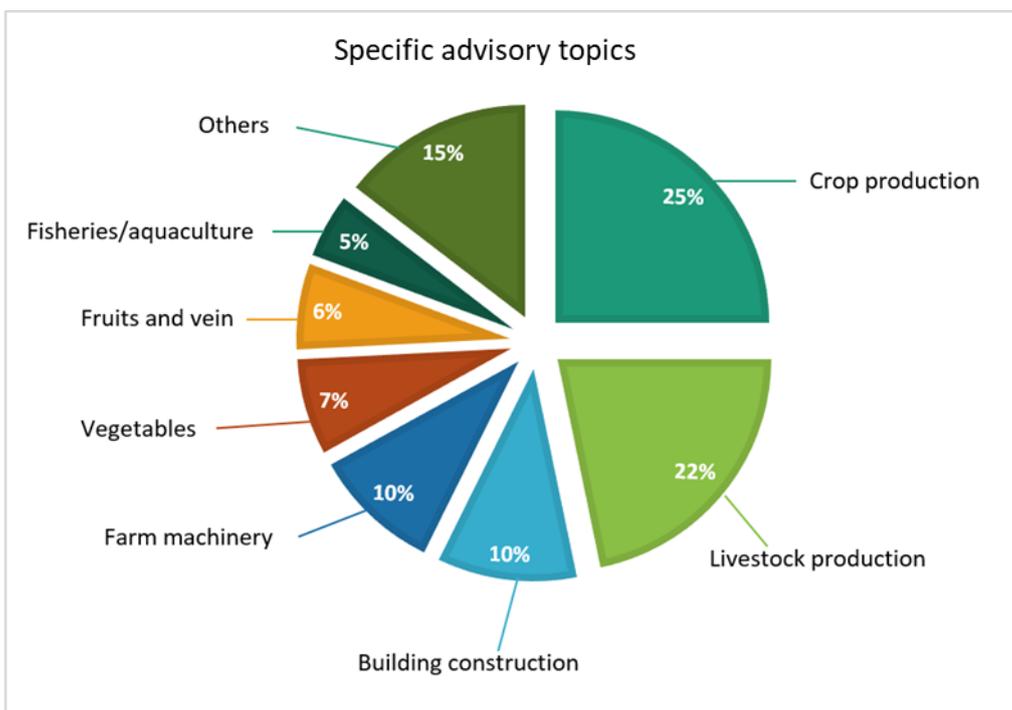


Figure 15: Specific advisory topics offered to clients (Total response n= 124)

Additionally, twelve organizations from 35, reported that they outsource cross-cutting and specific advisory topics. Topics outsourced vary from law and taxes, renewable energies, specific production technologies, marketing and logistics, to funding applications.

## 4.5. Linkages with other AKIS actors and knowledge flows

Participants were asked to rate the degree of cooperation in advisory service delivery with select types of actors on a scale from 'no', 'weak', 'medium' to

‘strong’ cooperation. Most participants rated the degree of cooperation with public authorities, FBOs, and private companies as medium or strong (Figure 16). In contrast, the degree of cooperation with universities, NGOs, upstream and downstream industries, EIP-operational groups, and EU-projects were mostly rated as of no or weak cooperation. Here, the no or weak cooperation rating with EIP-operational groups is in contrast to the expert interviews’ content. This could be due to the small outreach of EIP-operational groups in Germany, and could have been the case that many of the organisations who took part in the survey were not part of EIP-operational groups. The degree of cooperation with research institutions seems stronger than cooperation with universities, which could be due to the theoretical focus of universities as compared to research institutes.

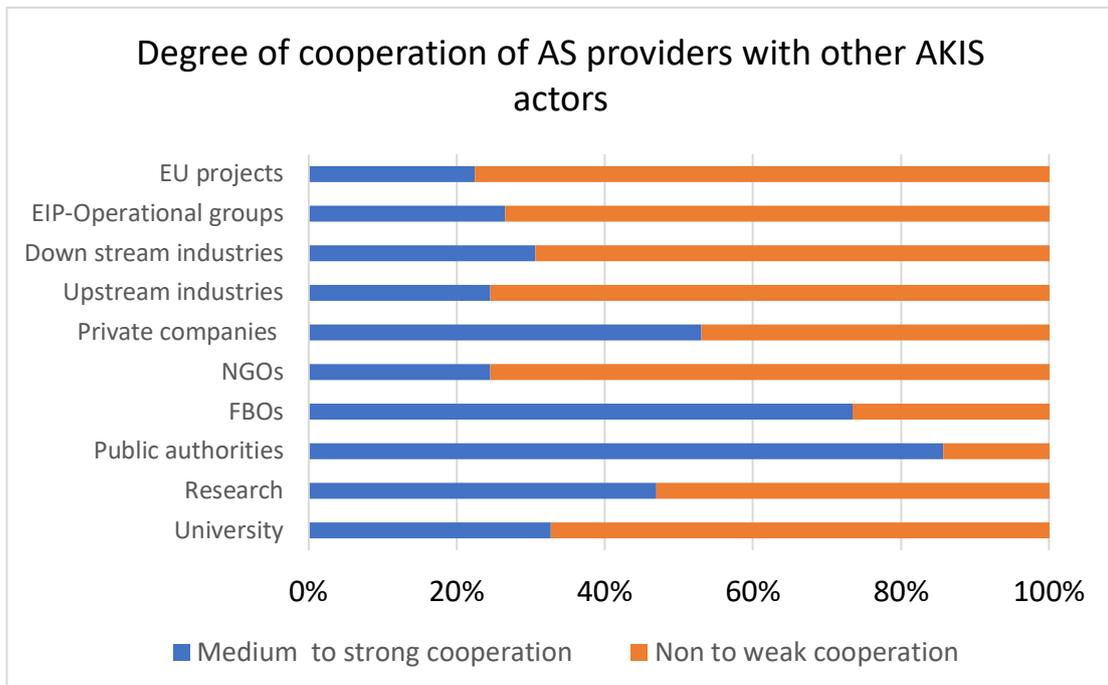


Figure 16: Degree of cooperation of advisory service providers with other AKIS actors

## 4.6. Programming and planning of advisory work

Concerning staff development plans in the advisory organisations, 51% (18 out of 35) reported having a yearly plan. Many affirmative responses came from government organisations followed by private organisations, mixed organisations and FBOs. For the organisations that claimed to have a staff capacity development

plan, the strategies listed include providing advanced training courses via internal or external seminars, obliging advisors to participate in at least two specialist training per year and organising a young talent promotion program.

When asked if the advisory organisations have a trainer or a training unit responsible for developing staff capacity, only 36% (12 out of 33) responded yes. The remaining 64% (21 out of 36) who did not have own trainers or training units, mentioned that they invite external trainers from other organisations to provide training in necessary topics advisors identify. Also, advisors are encouraged to participate in conferences and meetings organised by external organizations, as reported by some respondents. Regarding how often advisors receive training on advisory knowledge and skill, 79% of the organisations (26 out of 33) are reported to organize training for their advisors for half a day to 5 days every year. Also, 18% (6 out of 33) reported 6 to 10 days of training in a year, while one organisation reportedly organizes an exceptional 30 days of training for its advisors.

Rewarding advisors for good performance and incentivising skills development is practiced by 40% (n=35) of the advisory providers by offering performance-related remuneration either as a salary increase or bonus, giving opportunities to participate in conferences, fairs and training courses by covering costs.

Concerning time allocation for different advisory activities, the survey results show that advisors allocate up to 43% (n=27) of their time for targeted consultancy (Figure 17)

**Average proportion of time allocated for advisory activities**

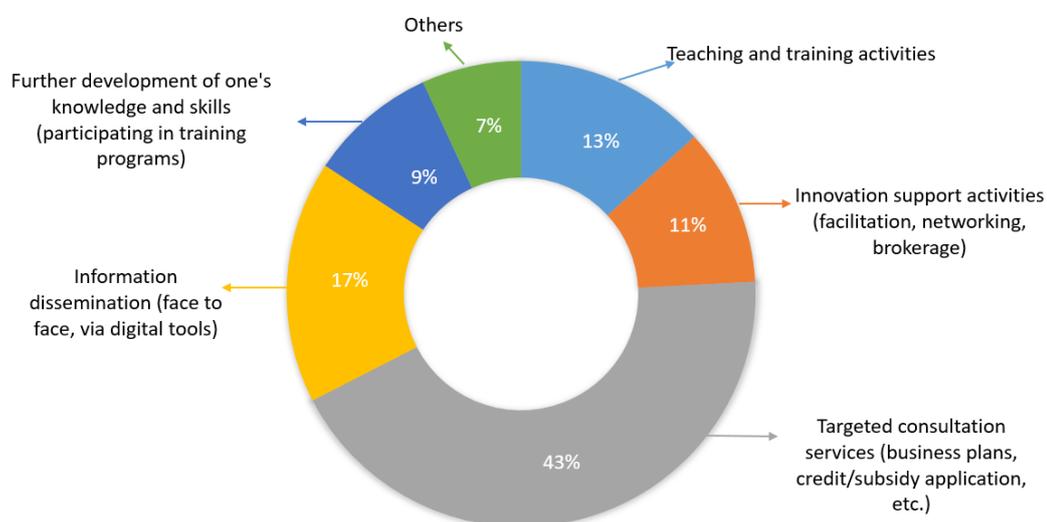


Figure 17: Average proportion of time allocated for various advisory activities

When asked about the technical and methodological knowledge and skills that advisors need in the organisations to meet the new CAP challenges, specific technological knowledge (e.g. farming practices and production technologies) was selected most frequently, followed by ecology and environment protection. Concerning the methodological skills needed, respondents from advisory organisations opted for digital skills and facilitation skills. On the other hand, freelance advisors indicated only the need for digital skills to meet the new CAP challenges. Similarly, the expert interviews results showed that advisors' interest for methodological skills development has increased in the recent years.

## 4.7. Advisory organisations forming the EU-FAS

Countries in the European Union have a farm advisory system (FAS). The FAS aims at supporting farmers to better understand and meet the EU rules for environment, public and animal health, animal welfare and the good agricultural and environmental condition. When asked of their role in offering advice related to the EU-FAS topics, 79% of the organisations (n=33) reported that they advise farmers to adapt their farms to the cross-compliance requirements by embedding the service with other advisory activities (70%) or separately (9%). The results show that government organisations and FBOs are responsible for the larger proportion of EU-FAS advice (65%).

## 5. Summary and conclusions

### 5.1. Summary and conclusions on sections 1 – 3

Germany continues to be one of the leading European countries in agriculture production, specifically in cereals and cattle farming. Nevertheless, the overall contribution of agriculture to the country's GDP and employment is minimal. Furthermore, the trend towards a decrease in the number of farm holdings and an increase in the average farm size per holding continues. Aside from that, the increasing shift towards organic farming in response to consumer's demand shows the market potential for such agricultural produce in the country.

Given the multiplicity of actors in the German AKIS, it can be considered as a strong system, and with manifold contributions from public authorities, research and education, private companies and third sector organisations it represents a pluralistic AKIS. Similarly, the policy framework and multiple coordination structures illustrate well the political focus that the AKIS receives in Germany. The policy framework and the coordination structures at national level facilitate the vertical interplay between the central and federal states, so that in this respect the national AKIS can be considered as strong. In contrast, structures for horizontal interplay among the states seem either weak or even missing, so the overall picture is that of parallel work and fragmented cooperation rather than one of integration.

Some multi-level farmer-based organisations and private entrepreneurial associations fulfil a strong linking and integrating function at the national level, which contributes to the maintenance of an overarching AKIS and its vertical connection with other actors at the state and local level. In contrast, the linkage of universities, research, and ministries at the national and state levels with other AKIS actors appears weak. At the state level, actors such as vocational education institutions, chamber of agriculture and public advisory offices play an active role in establishing and maintaining knowledge flows among the AKIS actors. In general, the German AKIS can be regarded as strong but partly fragmented.

Regarding forests and the forest sector, Germany is one of the leading timber producers in Europe. About half of the total forest area is owned by the state while the rest belongs to private foresters. In this report, the FKIS is presented separately as it is considered a separate and independent system from the AKIS.

However, an overlap can be seen with forest owning farmers, but that takes only a small share of the larger heterogeneous forest owners' group. Furthermore, the forestry sector will likely receive more attention in the near future due to the effects of climate change, such as the recurring drought observed in the past few years. This expected increased attention to forestry favours more insights into the shaping and functioning of Germany's forestry knowledge and innovation system.

## 5.2. Summary and conclusions on section 4

Germany's federal states are responsible for implementing advisory services for agriculture, forestry, and horticulture enterprises. This explains the diversity of advisory service providers and structures among the states. While either the chambers of agriculture or state authorities or private companies are predominant in the respective states, various associations and NGOs offer advisory services at the local, state and national levels throughout the country. In contrast, forest owners have fewer advisory service providers, namely state organisations and forest associations.

The low response rate and the limited geographical coverage of the survey results constrain the interpretation of advisory service provision for the whole of Germany. Nevertheless, the following insights on the topic are thought-provoking and worthwhile:

- From the survey results, it can be observed that the majority of the advisory organisations have mixed funding sources, and that the national or regional public funds dominate. This signals the prominent role that the public sector has for the provision of advisory services.
- One to one advisory services on the farm hold the upper part of advisory methods in contrast to group approaches or mass approaches offered by the advisory providers. This relates to the fact that farm enterprises are increasingly diverse resulting in situation- specific problems. Secondly, one to one advice as a preferred option in the context of the privatisation of advisory services, where farmers pay for specific advice.
- The clients of advisory services range from small to medium and to large scale farmers and no particular target group is recognized per type of service provider. In contrast, targeted services for specific interest groups such as farmworkers, new entrants, or other advisors are less common among the survey participants.

- In the organisations and among freelancers, most advisors are highly qualified with many years of professional experience and a higher education level supplemented by additional certifications. Thus, the result provides insights into the high-level competency of advisors in the German agriculture sector.
- The survey results show significant differences in number of contract the advisory providers have. While, thousands of farmers contract the public advisory organizations and FBOs for advisory services in a yearly basis, private organizations including freelancers have a much lesser amount but larger diversity ranging from five to 500 clients in a year. This situation could easily be attributed to the organisational capacities.
- The strong cooperation of advisory providers with other public advisory organisations, farmer-based organisations, and private companies affirms the important role these actors have in knowledge sharing, service provision, and connecting actors. Naturally, the gap between research and universities with practice is still prevalent; with the exception of strong linkages between applied universities and advisory service providers.
- Additional advisory certifications, particularly certification related to methodological skills such as those offered in the CECRA courses, tend to receive more attention and are considered necessary to raise the quality of advisory services provided.

## 6. Methodological reflection, acknowledgement, information sources and gaps

To compile the AKIS in Germany in the context of the i2connect project, we conducted a literature review on German agriculture and forestry, expert interviews with representatives from twelve organisations in the agriculture and forestry sectors and an online survey. The expert interviews gave an overview of the AKIS in Germany at the national level. They were instrumental in identifying AKIS actors and their linkages, the policy framework, funding mechanisms, challenges and knowledge needs. While organisations in the German AKIS are numerous, we selected only a few representative organisations that play an important role in the AKIS. Accordingly, we conducted interviews with representatives from the organisations listed in **Error! Reference source not found.** We want to acknowledge all those who participated in the expert interviews and the online survey for sharing their knowledge and experience.

The survey questionnaire was sent to agriculture advisory service providers in each state of Germany via an online platform called EU-Survey. In addition, networks such as IALB were used to distribute the questionnaire to more than 200 independent advisors and 80 advisory organisations. Although the questionnaire was widely distributed, the response rate was relatively low. One reason for the low response rate was technical problems such as firewall and server updates, which challenged respondents to access the questionnaire. The results of the survey do not equally cover all German states. For example, 44% (23 out of 5) of the data came from only two southern states. Also, in few states, no advisory organisations participated in the survey.

While interesting insights can be drawn from the results of the study, there are some limitations worthy of consideration,

- Due to the strict data protection law, the study team had restricted access to advisory service providers and freelancers' contact addresses. Therefore, there is no clear overview of the delivery rate versus the response rate
- The report was intended to assess forestry advisory service providers; however, the low response rate on forest advisory provision gives a shallow overview of forest advisory service providers in Germany

- The survey targeted advisory organisations mainly in the five categories; therefore, upstream and downstream industries that offer advice to farm and forest enterprises were not included
- On methodological issues, the questionnaires refer to farmer-based organisations in the broader sense that includes chambers of agriculture, farmers' associations and other professional associations. Therefore, it was challenging to distinguish service provision between these closely related but unique organisations during the data analysis. Moreover, although it was recommended that someone who had a broader overview of the organisations fill in the questionnaire, we have observed that some respondents left out questions that required quantitative figures which might have been due to the fact that the respondents had little overview about the organizational information requested.

Table 2: Institutional affiliation of expert interviewees

No.	Organisation (German)	Organisation (English)	Date of Interview
1	Bundesanstalt für Landwirtschaft und Ernährung (BLE)	Federal Agency for Agriculture and Food	29.07.2020
2	Bundesministerium für Ernährung und Landwirtschaft (BMEL)	Federal Ministry of Food and Agriculture	03.08.2020
3	EIP- Schleswig Holstein	EIP- Schleswig Holstein	07.08.2020
4	Verband der Landwirtschaftskammern (VLK)	Association of Agricultural Chambers	11.08.2020
5	Hochschule für nachhaltige Entwicklung Eberswalde	Eberswalde University of Sustainable development	13.08.2020
6	Deutsche Agrarforschungsallianz (DAFA)	German Agricultural Research Alliance	18.08.2020
7	Deutscher Bauernverband	German Farmers' Association (representative for vocational training)	26.08.2020
8	Deutscher Bauernverband	German Farmers' Association	28.08.2020
9	Bund Ökologische Lebensmittelwirtschaft (BÖLW)	The association of agricultural producers, processors and retailers of organic foods in Germany	September 2020
10	LMS Agrarberatung GmbH	LMS agriculture consulting company	September 2020
11	BLE- B&B agrar	BLE- B&B agrar	09.09.2020
12	Waldbauernschule Kelheim, Goldberg (WBS)	Bavarian Forestry School	September 2020

13	Bayerischen Forstschule und Technikerschule für Waldwirtschaft Lohr am Main	Forestry and technical school for forest management	September 2020
14	Bayerischen Landesanstalt für Wald und Forstwirtschaft (LWF) in Freising	The Bavarian State Institute for Forests and Forestry	September 2020

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# AKIS and advisory services in *Greece*

## Report for the AKIS inventory (Task 1.2) of the i2connect project

***Date: November 2020***

**Authors:**

Alex Koutsouris  
Eleni Zarokosta  
Eleni Pappa  
Vassiliki Kanaki

Contact: [koutsouris@aua.gr](mailto:koutsouris@aua.gr)

Project funded under the Horizon 2020 Research and Innovation Programme under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION' HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

The main aim of the report is to provide a comprehensive description of the Agricultural Knowledge and Information System (AKIS) in Greece, with a particular focus on agricultural advisory services. This report is one of the AUA outputs<sup>1</sup> in the framework of Task 1.2 of the i2connect project (Connecting advisers to boost interactive innovation in agriculture and forestry) aiming “... to update the existing AKIS descriptions for the 27 EU member states (cf. <http://proakis.webarchive.hutton.ac.uk/>) and to expand the inventory through elaboration of reports for Croatia, Switzerland, Montenegro and Serbia.” (i2connect Grant Agreement). Thus, it is one of the country reports that were produced in 2020 by project partners and subcontractors for compiling an inventory of Agricultural Knowledge and Information Systems. In this report, AKIS description is based on the infrastructural concept. The report at hand thus includes AKIS characteristics (actors, policy, governance and coordination), a short history of the advisory system, and an overview of the current advice providers and their key characteristics (such as funding, human resources, advisory methods, clients and topics, etc.).

The agricultural sector in Greece is characterised<sup>2</sup> by the fourth smallest average farm size in Europe (average 6.6 ha. vs. 15.2 ha. in EU-27), one of the highest proportions of small scale family farms (51.5% less than 2 ha.) and the second highest percentage of employment in agriculture (11.1% vs. 4% in EU-27). The average age of farmers is higher than in most European countries (33.5% over 65 years old vs. 32.8% in EU-27); the number of young managers less than 40 years old by 100 elderly managers (65 years and over) is among the lowest in the EU (24.9 vs. 32.5 in EU-27) while, at the same time, their education is the second lowest in the EU (93.2% of the farm managers have practical experience only vs. 68.3% in EU-27). Labour productivity in agriculture (EUR/AWU<sup>3</sup>) is well below (67.8%) the EU-27 average.

Crop production is much more important than livestock production (75:25 in terms of gross output, 2018); farms with livestock account for 35% of all farms.

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<sup>1</sup> The second one concerns the Cypriot AKIS report.

<sup>2</sup> The data cited here were drawn for the CAP context indicators.

<sup>3</sup> Euros per Annual Work Unit

Fruits, vegetables, olive oil, industrial crops and cereals account for 60% of total output value.

Arable cultivations cover about 54% of agricultural land followed by permanent cultivations (around 34%) and fallows (11%). Main crops<sup>4</sup> are cereals (mainly wheat, maize and barley), olive trees, fodder crops, cotton, fruit trees, vineyards and vegetables. Small ruminants (sheep and goats) predominate in animal production (64% of all LSU<sup>5</sup>), esp. in mountainous areas.

The Greek AKIS is highly fragmented and ineffective. Decentralisation, the split up of research and (farmers') training from the Ministry of Rural Development and Food and the inadequate or lacking coordination mechanisms between stakeholders have led, at best, in extremely weak linkages and thus cooperation among the main public AKIS components; the recent financial crisis further aggravated the situation. Furthermore, cooperation with private actors is largely opportunistic.

Given that, since the accession to the EEC<sup>6</sup>/EU in 1981, the Greek Extension Service gradually got heavily involved in fulfilling the increasing administrative/bureaucratic tasks of the State, advice to farmers is largely provided by private agronomists who run or work for input shops at the sub-regional/local level. On the other hand, private consultants (agronomists) serve those interested in having access to EU programmes and are thus severely restricted in terms of providing advice. An exception to this picture concerns producer groups, esp. the ones under Integrated Production Management.

Overall, in the last 30 years, despite continuous calls for the reorganisation and reorientation of extension/advisory service(s) in Greece, the system has been disrupted. The underway CAP Strategic Plan procedures are expected, through the appropriate utilization of the tools provided, to trigger the revival of advisory services in the country.

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<sup>4</sup> In terms of cultivated area.

<sup>5</sup> LSU = Livestock Units

<sup>6</sup> EEC = European Economic Community

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## Abbreviations

CAP: Common Agricultural Policy

DA: Development Agency

Dir RE&V: Directorates of Rural Economy and Veterinary (sub-regional/prefectural level)

EIP-AGRI OGs: Operational Groups of European Innovation Partnership – Agriculture (in red = not yet operational)

ELGO DIMITRA: Hellenic Agricultural Organisation DIMITRA

FAS (M2 of the RDP): Farm Advisory System of M2 of the RDP (in red = not yet operational)

GSRT: General Secretary for Research and Technology

HEIs: Higher Educational Institutes

KEA: Farmers Service Centres of GAIA Epicheirein

KEGE: (Local) Agricultural training center of ELGO DIMITRA

KEPPYEL: Centres for the quality control of propagation materials & fertilizers

MoA: Ministry of Agriculture

MRDF: Ministry of Rural Development and Food (ex MoA)

NAGREF: Gen. Dir of Rural Research of ELGO DIMITRA (ex: National Agricultural Research Foundation)

NEA PASEGES: Farmers' Union

NFAS (in red): National Farm Advisory System

NRN: National Rural Network

RDP MA: Rural Development Programme Managing Authorities

OGEEKA: Gen. Dir of Rural Education & Training of ELGO DIMITRA (ex: Organisation of Agricultural Vocational Education, Training and Employment)

PEGEAL: Regional laboratory of agricultural extension and fertilizer analysis

SASOE: Farmers' Union

## 1. Main structural characteristics of the agricultural and forestry sector

### *General country information<sup>7</sup>*

Following some key-data about Greece are provided. The total area of land covered by the Greek state is 130,048 km<sup>2</sup> (AFF) with the share of farmland being 35% (2016, AFF). The country's population is 10.7 million (2018, AFF). The GDP<sup>8</sup> is 184.7 billion EUR and the GDP per capita 17,264 EUR (2018, ASF). Following the considerable rise of unemployment in the 2010s, owed to the economic recession, currently unemployment is as high as 19.6% of labour force (2018, ASF). The exports of agricultural products are 5,901 million EUR while the imports are 6,558 million EUR (2018, ASF).

### *Information on the agricultural sector*

Following an overview of the agricultural sector is given, using topical data that underline the agricultural features of the country. The agricultural sector in Greece is important for both the rural areas and the national economy, in general. Indeed, agriculture's contribution to employment is as high as 10.6% (2017, AFF<sup>9</sup>) while it contributes 2.7% to the GDP (2018, AFF) and further affects significantly other sectors of the economy<sup>10</sup> as well as the country's social and cultural development.

The farmland (Utilised Agricultural Area - UAA) is estimated to 4,554 thousand hectares (2016, AFF) with 684,950 (2016, AFF) farms (agricultural holdings). The average farm size (UAA per holding) is 6.6 ha. (2016, ASF) with the majority of the farms (67.7%) being characterized as very small in terms of either standard output (with < EUR 8,000 of standard output; 2016, AFF<sup>11</sup>) or size (77.3% have UAA below

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<sup>7</sup> Sources: AFF: Agriculture, Forestry and Fishery Statistics 2019 and ASF: Agristatistical Factsheet 2019

<https://ec.europa.eu/eurostat/documents/3217494/10317767/KS-FK-19-001-EN-N.pdf/742d3fd2-961e-68c1-47d0-11cf30b11489>

<sup>8</sup> Gross Domestic Product

<sup>9</sup> Agriculture: Labour force in % of total employment (2017): 11.5% (ASF)

<sup>10</sup> For example, food processing is the largest sub-sector of manufacturing in Greece. This owes to the availability of high quality raw materials, specialized know-how and reasonable costs.

<sup>11</sup> Economic size < 4,000 € (2016): 49.7% (ASF)

5 ha.; 2016, ASF). The great majority (99.3%) of all farms are family farms, i.e. more than 50% of regular labour comes from family members (2016, AFF).

With regard to organic farming, the area under organic farming is as high as 9.32% of UAA (2018, Eurostat)<sup>12</sup> with the organic crop area (fully converted area) being 316,753 ha (2018, Eurostat)<sup>13</sup>.

Furthermore, according to ASF (2016) the farm holders less than 35 years old account for the 3.7% of all holders while the ones over 64 for 33.5%. The total labour force input in agriculture is 428 thousand annual work units<sup>14</sup> (2018, AFF). Young farmers (under 40 years old) (2016) account for 8.3% of all farm managers with female farmers being 27.5% of all farm managers (2016, AFF). Farmers with full agricultural training account for only 0.6% of all farm managers (2016, AFF).

Table 1.1: Structure of farm labour force (2016, ASF)

<b>Family labour force</b>	1,164,560 persons AWUs: 378,450	<b>Non family labour force</b>	24,390 AWUs
<b>Holders</b>	<b>Family members</b>	<b>Regular non-family labour force</b>	<b>Non regular non-family labour force</b>
684,250 persons 237,930 AWUs	480,310 persons 140,520 AWUs	24,390 AWUs	54,320 AWUs
<b>Total farm labour force: 457,160 AWUs</b>			

The value of agricultural output (production value at basic prices) (2018) is 10,942 million EUR with the Gross value added (at basic prices) being 5,386 million EUR<sup>15</sup>. The value of crop output is 7,568 millions EUR while the value of animal output is 2,524 millions EUR (2018, AFF). The main branches of agricultural production are illustrated in Table 1.2.

<sup>12</sup>

[https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=sdg\\_02\\_40&language=en](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=sdg_02_40&language=en)

<sup>13</sup> <https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=tag00098&language=en>

<sup>14</sup> AWUs = Annual work units. An AWU is equivalent to a worker employed on a full time basis for one year.

<sup>15</sup> Gross value added from Agriculture, forestry and fishing (2018): 4.3% of total GVA (ASF)

Table 1.2: Crop and Animal Production (in thousand tones) <sup>16</sup>

Cereals	2018	2,997
Root crops	2018	530
Fresh vegetables	2018	2,669
Permanent crops	2018	5,237
Raw milk	2018	1,845
Bovine meat	2018	40
Pig meat	2018	82
Poultry meat	2018	220
Sheep and goat meat	2018	70.10

Specifically as far as animal production is concerned, all livestock categories account for 2,102,870 LSU<sup>17</sup>, with the livestock density index (2016) being 0.46 LSU/ha UAA<sup>18</sup>. A more detailed account of Heads and LSUs is provided in Table 1.3.

Table 1.3: Livestock in Greece

Livestock <sup>19</sup>	Year	Heads	Livestock Units (LSU)
Bovine	2018	541,845*	389,884*
Pigs	2018	721,390	179,873
Sheep	2018	8,429,654	842,965
Goats	2018	3,624,719	362,472
Poultry	2016	30,390,000	280,410

\* Includes buffaloes.

### ***Information on the forestry sector.***

The forest and other wooded land is 6,539 thousand hectares (2015, AFF) while the farms with wooded area Greece are 8,960 holdings<sup>20</sup>. An overview on the forestry sector is provided in Table 1.4.

<sup>16</sup> Source: Agriculture, Forestry and Fishery Statistics 2019 (AFF); for sheep and goat meat: <https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=tag00045&language=en>

<sup>17</sup> The livestock species aggregated in the LSU total, for the purpose of this indicator, are: equidae, bovine, sheep, goats, swine, poultry and rabbits.

<sup>18</sup> Source:

<https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tai09&plugin=1>

<sup>19</sup> Source: Hellenic Statistical Authority (2018); for poultry see Eurostat (Main livestock indicators by NUTS2 regions)

<sup>20</sup> Source: [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ef\\_lus\\_main&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ef_lus_main&lang=en)

Table 1.4: Forestry in Greece

Forestry	Year		
Forest and other wooded land	2015	6,539	thousand hectares (AFF)
Persons employed in forestry and logging	2016	4,260	Working units
Gross value added (at basic prices)	2016	66	EUR million
Roundwood (in the rough)	2017	:	Thousand cubic metres

Source: Agriculture, Forestry and Fishery Statistics, 2019

The output of forestry and connected secondary activities is 93.58 millions EUR (2015, Eurostat)<sup>21</sup> and the Gross Value Added (at basic prices) is 66 millions EUR (2016, AFF).

Finally, while the persons employed in forestry and logging amount to 4,260 working units (2016, AFF), a more recent account is illustrated in Table 1.5.

Table 1.5: Employment in forestry related activities (2019)<sup>22</sup>

Type of employment	Number of employed persons (in thousands)
Forestry and logging	6.9
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	10.1
Manufacture of paper and paper products	7.4
Manufacture of furniture	12.9
Total (for manufacture)	30.4

<sup>21</sup> [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for\\_eoutput&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for_eoutput&lang=en)

<sup>22</sup> [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for\\_emp\\_lfs&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for_emp_lfs&lang=en)

## 2. Characteristics of AKIS

### 2.1. AKIS description

In Greece, the AKIS structure and functions have not been changed since the previous report (re: PRO-AKIS). Few changes have appeared, esp. in the private advisory companies, which will be dealt with below.

At national level the main actors are: the Ministry of Rural Development and Food (MRDF/ ex-Ministry of Agriculture/MoA), ELGO DIMITRA (incorporated in 2011 the ex-semi-autonomous organisations NAGREF, OGEEKA, AGROCERT and ELOGAK<sup>23, 24</sup>), the National Rural Development Programme Managing Authorities (NRDP MA), Higher Education Institutes (HEIs)<sup>25</sup>, private input companies (branches of transnational companies) and Farmers Cooperatives' Unions<sup>26</sup>. Other actors are the Ministry of Education<sup>27</sup>, the General Secretary of Research and Technology (currently under the Ministry of Development<sup>28</sup>) and the Geotechnical Chambers of Greece<sup>29</sup>.

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<sup>23</sup> NAGREF: National Agricultural Research Foundation; OGEEKA: Organisation of Agricultural Vocational Education, Training and Employment; AGROCERT: Agricultural Products Certification and Supervision Organization (responsible for the implementation of national policy on quality in agriculture); ELOGAK: Greek Organisation for Milk and Meat.

<sup>24</sup> ELGO DIMITRA at national level operate, on the one hand, 11 research Institutes and their experimental stations (re: ex-NAGREF) and, on the other hand, seven (7) occupational schools (re: ex-OGEEKA DIMITRA). Through the latter, ELGO provides initial training (2 years of studies) on the following topics: dairy-cheese making, viticulture-oenology, animal production, greenhouses, agricultural machinery, landscape architecture and wood curving-cabinetmaking in 6 specialized occupational schools located all over Greece. Such courses usually attract 250-300 students per year with almost half of them attending the dairy-cheese making courses at the Ioannina School (Epirus region, northern Greece).

<sup>25</sup> Agricultural University of Athens; School of Agriculture, Aristotle University of Thessaloniki; Dept. of Plant Production and Dept. of Animal Production, University of Thessaly; Dept. of Agricultural Development, Democritus University of Thrace; in parallel, ex-Higher Technological Institutes have been recently upgraded to university status.

<sup>26</sup> The previous Pan-Hellenic Confederation of Unions of Agricultural Co-operatives (PASEGES) has been split into two new Unions (see below).

<sup>27</sup> The Ministry of Education provides agricultural education through the Technical Lyceum's programme "Agronomy, Food and Environment". The numbers of students attending such courses revolves around 5% of the Technical Lyceum and 1.5% of all Higher Secondary Education (Lyceum) students. Among the students following this programme of studies, almost half attend the specialized courses on Agronomy/agriculture (3<sup>rd</sup> year of studies) and the other half follow either the Food Technology or the Landscape & Environment specializations.

<sup>28</sup> Till recently GSRT was operating under the Ministry of Education. Some of its research Institutes carry out research relevant to the agrifood system.

<sup>29</sup> The Geotechnical Chambers represent Higher Education Graduates in Agronomy, Veterinary, Forestry, Ichthyology and Geology and they are an official consultant to the MRDF.

The rising importance of the secondary and tertiary sector actors has to be underlined (esp. through contract farming arrangements). Such actors (processing industry, wholesalers, Super Markets, retailers, exporters) in many cases set, in fact, the quality standards that often concern not only the agricultural production per se but the whole value chain.

A further development at the national level, since 2014, has been the establishment of GAIA EPICHEIREIN and RURAL INNOVATION S.A., i.e. nation-wide structures involving a range of actors (see below).

At the regional level the main actor is the regional Directory of Agricultural Economy (of the elected Regional government) and at the sub-regional (ex-Prefectural) level, the Directorate of Agricultural Economy & Veterinary (under the elected prefectural authority) and local Development Agencies. ELGO DIMITRA at this level operate local training centres (KEGE<sup>30</sup>; ex-OGEEKA DIMITRA). Unions of Cooperatives are also found at regional or sub-regional level. Finally, private consultants-agronomists and private input shops (run by agronomists) are found usually at sub-regional/ex-prefectural level<sup>31, 32</sup>.

In Greece there is neither a national (agricultural/ rural development) policy framework nor any kind of coordination mechanism or agreements between the aforementioned AKIS actors. Indeed, it is a common understanding that, despite rhetoric and marginal, fragmented actions, MRDF has long ago ceased to put together an overall national strategy for agriculture and rural development (including a strategy about extension/advisory services and AKIS); instead MRDF rather plays the role of an intermediary transferring and controlling the

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<sup>30</sup> KEGE are located all over Greece and are mainly used for short courses, predominantly for the obligatory courses (duration: 150 hours) for those who access the 'Young Farmers' Measure of the National Rural Development Programme/ CAP. Occasionally, other trainings also take place in KEGE.

<sup>31</sup> MRDF also operates some structures such as KEPPEL (Centres for the quality control of propagation materials & fertilizers - 39 all over Greece); PEGEAL (Regional laboratory of agricultural extension and fertilizer analysis), carrying out water, soil and leaf analyses and provide advice to farmers on fertilization - 7 all over Greece); 7 regional centres for plant protection and quality control (providing information/recommendations on necessary/appropriate plant protection measures/interventions, according to agro-climatic, etc. conditions, per season) and 5 centres of genetic improvement (re: traditional/native livestock breeds).

<sup>32</sup> In the past, Agricultural Extension/Rural Development Offices (branches of the Extension Section of Directorates of Agriculture – nowadays Dir. of Rural Development & Veterinary which have abolished the Extension Section) were operating at municipality level. Nowadays the agronomists working at the Municipality level do not play any role in farmers' training or advice provision any more as they are occupied in various administrative tasks of the municipalities (thus they are not included in the AKIS diagram).

implementation of the EU policies (CAP Regulations and relevant financial resources/subsidies) in the country.

Thus, at national level, one can observe stable interactions only between, on the one hand, MRDF and, on the other hand, its semi-autonomous organisation ELGO DIMITRA and the NRDP Managing Authorities<sup>33</sup>. No other official or organised kind of interactions among the actors/stakeholders is observed. All kinds of links are rather opportunistic (for example, projects; ad-hoc, short-term/emergency committees; stakeholders; lobbying to express their demands to the Ministry, etc.) and/or due to (past) acquaintance (for example, agronomists working in various organisations/companies contacting their ex-professors to ask for advice, etc.). Of course, HEIs have an indirect link with all other actors and the Geotechnical Chambers comprising their ex-students<sup>34</sup>. But overall there are no established/official links between actors. The only exception to the rule is the National Rural Network (located in the RDP MA) who keep some contact with farmers, advisors/consultants, development companies/LAGs, etc.

MRDF keeps links with the regional GDs of Rural Economy and the latter with the sub-regional Dir. of Rural Economy and Veterinary (and vice-versa) but mostly for administrative reasons. Since the 1990s, in the name of the downsizing of the state, i.e. decentralization (Decentralisation Laws I-Kapodistrias and II-Kallikratis; see below) and, lately, the economic crisis, the previously existing structures under one authority – i.e. the Ministry of Agriculture (from the national to the sub-regional to the local level), have become (semi)autonomous (see below) and/or transferred under new administrative structures/authorities (notably the various levels of (elected) Local Authorities: regional, sub-regional/prefectural, and local). On the other hand, the role of extension in both the Ministry and the sub-regional/prefectural Directorates has been seriously downgraded. Nowadays a Dir of Research, Innovation and Education (in the place of GD Research & Extension)

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<sup>33</sup> Of course, all organizations provide information (to those who are actively seeking it) through their portals/sites.

<sup>34</sup> Universities have sporadic interventions, esp. in terms of training provision, in the rural space, depending on funding by foundations, etc. For example, the Agricultural University of Athens, the Rutgers University (N.J. USA) and the American Farm School of Thessaloniki realize an initiative funded by the non-governmental organization Stavros Niarchos Foundation (SNF), aiming at the provision of targeted support (including training) to young farmers in certain areas of the country. Nowadays, universities identify some potential in the establishment of their Centers of Lifelong Learning, through which they aspire to be able to play, to some degree, the role played by the Land Grant Universities (university extension). These Centers aim at satisfying the increasing demand for university classes delivered to the general public and, among them, to farmers.

mostly for historical and symbolic rather than essential, functional reasons is found in the Ministry's chart; on the other hand, the Extension Section has been abolished from the Dir of Rural Economy and Veterinary charts.

The structures of ELGO DIMITRA, besides dysfunctional relationships among the General Directorates (i.e. the ex-organizations) which made-up the organisation, do not contribute essentially to (either the national or regional) AKIS. This is largely so since research is isolated from farmers and other structures (i.e. extension services/mechanisms) are not in place<sup>35</sup>. The same is true for universities as well, since most of the funding for research comes from the EU; as a result, the problems tackled by the EU-wide research consortia often do not correspond to the needs of the Greek agriculture/farmers<sup>36</sup>. The only exception, albeit in terms of training, is ELGO's 7 occupational schools and training centres (KEGE)<sup>37</sup>.

Therefore, at the local/sub-regional level the main provider of advice to farmers are input shops (run by private agronomists) followed by private advisory companies and consultants. The input supply shops are, in general, isolated from other AKIS-actors. There are about 4000 input supply shops all over the country; nevertheless, no more than 700 of them are direct, important clients of the input industry. The most dynamic ones have been expanding their activities to include the provision of advisory services, business plans and applications for modernization EU-supported schemes, the Integrated Administration and Control System (IACS) declarations, etc. Regardless their size and complexity, the input shops are very close to farmers and even the smallest ones exert considerable influence on farmers' decision making, given that they are the first stop shops for farmers requesting guidance and advice on all kinds of technical issues. Nevertheless, farmers do not trust input industries and input shops; this is so since farmers consider that they provide biased advice, bounded to their own specific products, while overselling is their ultimate goal in order to increase profits. On the other hand, through its connection with large numbers of input stores, the input industry is very successful in disseminating its products (including innovative ones) to farmers.

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<sup>35</sup> ELGO's mandate includes the provision of advice and technology transfer (the organisation's structure includes a relevant Section) which has not been activated since the organisation's establishment in 2011.

<sup>36</sup> Moreover, researchers tend to focus their research more on issues with academic interest rather than on local problems, which is 'reasonable' since their careers largely depend on the numbers of their publications (not on the provision of services to the farming community).

<sup>37</sup> See footnote 6.

Independent advisers/ consultants (either in companies or freelancers) can be distinguished in relation to their know-how, the range of services they offer and their scale of operation (local, national). The majority of independent advisory companies, which are mostly active at local rather than at regional or national level, support farmers' access in investment funding, available through the RDP measures, and subsidies (direct payments) through IACS declarations. A significantly smaller number of independent advisory companies operate at national level, providing specialized services on issues such as products' certification and marketing, integrated production management and smart farming.

Another actor embracing all levels are farmers' coops. However, a large number of cooperatives are in general very weak to develop substantial independent action, while others function essentially as brokers mediating between farmers and input traders. In some cases cooperatives act more as intermediaries transferring production requirements/ required standards from the markets to farmers, with some of them also undertaking various actions to facilitate farmers' access to knowledge/know-how. Among them a limited number of producers' groups and cooperatives, appear to be very dynamic and successful in dealing with their membership's needs by building collaborations mainly with independent advisory companies but also with input shops and industries and financial institutions. Overall, though, the picture of cooperatives after the collapse of the National Union (PASEGES) is fragmented with most cooperatives being divided in two new nation-wide alliances – SASOE and NEA PASEGES. An implication of this division is that these two entities do not agree in favor of a single representation of farmers in the national and EU decision -making centers.

In this framework the partnership of GAIA Epicheirein was established in 2014, comprising 71 (regional/local) unions of agricultural cooperatives, cooperatives and coop companies, the Piraeus Bank and a communication technology company (Neuropublic) active in the production of precision farming technologies/ digitization. GAIA have developed a broad network of collaborating local agronomists (mainly through its 88 Farmers Service Centres – KEA, most of which are affiliated/hosted by the cooperating coops) providing its membership with a variety of advisory services<sup>38</sup> and training (offered to both agronomists and

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<sup>38</sup> Many services are also provided on-line (through the company's portal).

farmers) and a vehicle for farmers' representation in COPA COGECA, while disseminating valuable information and connecting them with EU fora.

A recent development (2019) releasing a new dynamic among the independent advisory companies concerns the creation of a partnership (Agricultural Innovation) in the form of a limited company founded by 25 independent advisory companies<sup>39</sup>, 17 (regional/local) unions of cooperatives and Neupublic (see above). This move puts again the spotlight to the question and need for the provision of independent advice and rules that contribute to transparency; advanced/ digital technologies must be available to farmers along with independent/impartial advice to support farmers in making sound decisions which, in turn, implies that such advice cannot be provided by entities involved in products' development and sales.

Finally, at the local/ prefectural level a number of Development Agencies (incl. LEADER Local Action Groups/LAGs) are activated since the early 1990s. Quite a few of the DAs (which largely belong to local authorities, farmers coops and local chambers), on the one hand, implement various projects (besides local LEADER/CDLD) to support local development and, on the other hand, try to support farmers (and, in general, local entrepreneurs) playing the role of innovation brokers and animators.

As a result, nowadays, the overall picture is that of a highly fragmented, uncoordinated and dysfunctional AKIS. It is further worth noting that the RDP (2014-2020) Measures concerning 'knowledge transfer' (M1), the 'provision of advice to farmers' (M2) and Operational Groups of the EIP-AGRI (M16) are either curtailed (M1<sup>40</sup>) or not (fully) implemented yet<sup>41</sup>. Currently, the obligation of Member-States, put forward by the new CAP Regulation, to include AKIS into the planning of the National Strategic Plans for the next programming period may, given that there will be the political will to prioritize relevant work/Measures

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<sup>39</sup> The interest here is that ex-competitors decided to come together and co-operate mainly in the framework of digitization while on other topics each company follows their own strategy.

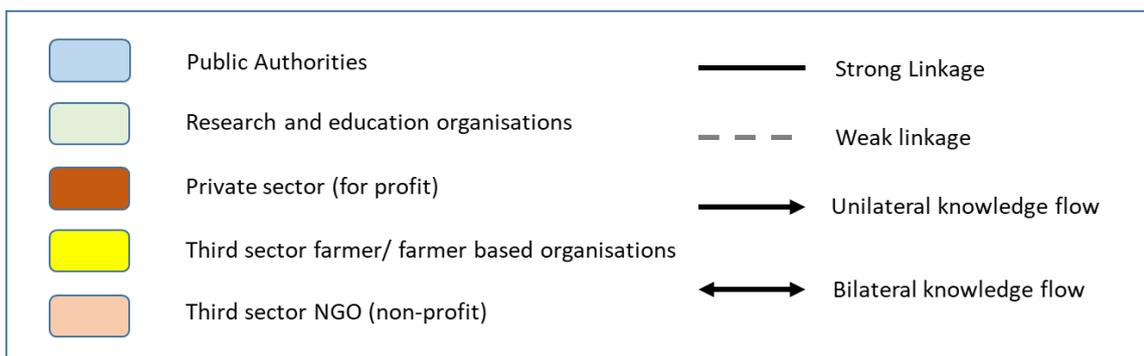
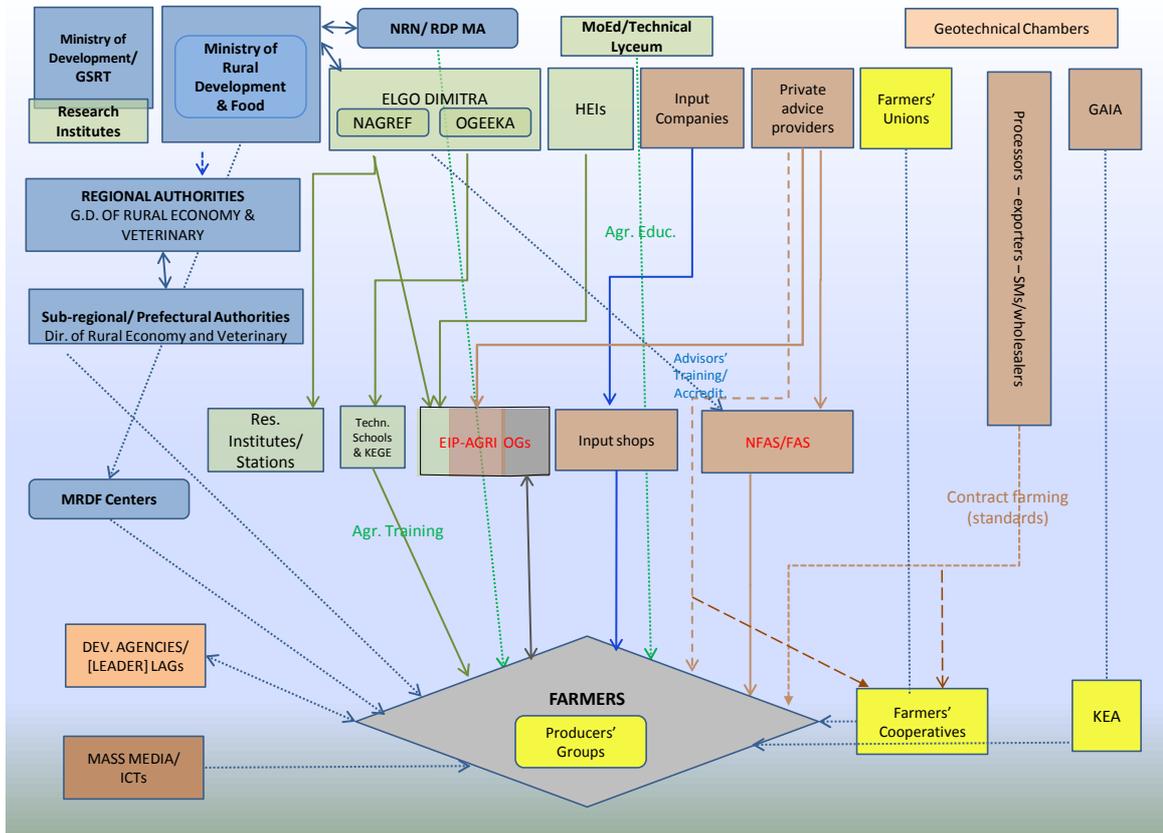
<sup>40</sup> Training (150 hours) only for those eligible for the Young Farmers programme is taking place. The sub-meters on exchanges and demonstrations have been cancelled.

<sup>41</sup> Three thousands eighty-four (3,084) advisors have been accredited in the framework of the National Farm Advisory System but the Measure (M2) has not been launched. Currently 229 OGs have been approved but the second phase (which is the essential phase of experimentation for innovation) has not been launched. In the previous RDP neither knowledge transfer nor OGs Measures were implemented; in parallel, the FAS Measure largely failed to achieve any of its espoused targets.

which, in turn, means to devote resources, result in a more structured and coherent AKIS in the country.

Below the updated account of the Greek AFKIS (AFKIS Diagramme) is illustrated.

## 2.2. AKIS diagram



### MEMO:

GSRT: General Secretary for Research and Technology (previously under the Ministry of Education)

NRN: National Rural Network

RDP MA: Rural Development Programme Managing Authorities

NAGREF: Gen. Dir of Rural Research of ELGO DIMITRA (ex: National agricultural Research Foundation)

OGEEKA: Gen. Dir of Rural Education & Training of ELGO DIMITRA (ex: Organisation of Agricultural Vocational Education, Training and Employment)

HEIs: Higher Educational Institutes

KEGE: Local training centres of ELGO DIMITRA

EIP-AGRI OGs (in red): not yet operational

NFAS/ FAS (M2 of the RDP) (in red): not yet operational

KEA: Farmers Service Centres of GAIA Epicheirein

### 3. History of the advisory system

Following WW II, the 'modern times' Extension Service was established in the Ministry of Agriculture (MoA) in 1951. Then, each of the prefectural Directorates of Agriculture was a branch (and integral part) of MoA; each Prefectural Dir. was further branched with Extension Offices in major towns and villages in each Prefecture, supervised by the Dir's Extension Section. The Dir. was also responsible for the local Training Centres (KEGE). In some cases other branches of the MoA were also present at Prefectural level (irrigation/land improvement Dir., veterinary Dir., specialised labs, etc.). This way there was a two-way communication between MoA headquarters in Athens and the decentralized services in the countryside. Furthermore extension programming (involving tangible, quantified targets) and evaluation were carried out.

After the country's accession in the EEC (1981), the role of MoA and especially the extension service gradually changed in becoming a bureaucratic mechanism responsible for the distribution of subsidies and the relevant controls. Therefore, information provision and training faded out and experimental and demonstration fields were abandoned on behalf of the maximisation and distribution of subsidies to farmers.

In 1989 NAGREF was established in an effort to promote agricultural research in Greece. The new organization mainly recruited MoA staff. The ambition of the first Boards to initiate NAGREF's own extension service was never realized.

With the first wave of decentralization (Kapodistrias plan, 1997), the Prefectural Directorates of Agriculture were cut away from MoA and transferred under the jurisdiction of the (for the first time elected) Prefectural authorities. The agronomists were thus transferred from MoA to the Local Authorities (supervised by the Ministry of the Interior) and controlled by the Prefect (prefectural governor) although the great majority of their tasks still proceeded from MoA. Furthermore, the Prefectural service became vulnerable to local pressures and politics.

The establishment of the OGEEKA DIMITRA as a semi-autonomous organization in 1997 implied the further downgrading of farmers' training due to the lack of staff and funds of the new organisation. Farmers' training focused on those entering

EU programmes, mainly Young Farmers (300 hours) and participants in modernisation schemes (150 hours). On a later stage (1994) training was restricted to Young Farmers (150 hours). On a later stage OGEEKA expanded its activities to other target groups such as rural women (150 hours) as well as through short seminars (60 hours) among which those for beekeepers are quite popular. Overall though, and despite improvements, the level of training (duration, topics, content, trainees, methodology, organization and evaluation) are but satisfactory.

The establishment of OPEKEPE, the Greek Payment Authority of Common Agricultural Policy (C.A.P.) Aid Schemes in 1997 (operational since 2001) implied the creation of a central service in Athens and its own branches at regional/sub-regional level which nevertheless were cut off from the Prefectural Dirs, responsible thus far for the control and payments of subsidies, grants, etc.

In 2005, in an effort to counterbalance the lack of extension services in the countryside the MRDF (MoA was renamed to MRDF in 2004) established (by Law) the TOKAA (Local Centres for Rural Development). These centres were actually in operation in 2008, staffed with highly qualified agronomists. However, they never got off the ground and in 2010 they were closed down and their staff was transferred mainly to OPEKEPE and the headquarters of MRDF and KEPPEL.

The Kallikratis plan in 2010 (aiming at saving public money through the reorganization and decentralization of the public services) implied the breakup of the regional services in two levels: regional and sub-regional (ex-Prefectural), and municipal. In parallel, various Dirs (agriculture/agricultural economy, veterinary, fisheries and land policy) were amalgamated into a single Dir. of Rural Economy & Veterinary at sub-regional (ex-Prefectural) level.

Overall the two waves of decentralization resulted in a dual structure: the headquarters of the MRDF and the regional and sub-regional services with no actual coordination among them. The changes introduced by the Kallikratis plan as implemented nowadays (local level) create still another, rather disconnected level, the Municipal Offices of Agricultural Production which evolved to a purely bureaucratic office.

According to a Presidential decree for MoA (1990), the MRDF comprised seven General Directories one of which was the GD of Agricultural Extension & Research. This, in turn, comprised five Directories, one of which was the Dir. of Agr. Extension<sup>42</sup>. The new organization scheme of the MRDF 2017 downgraded the ex-GD to a Dir of Research, Innovation and Education under the Gen. Dir. of Rural Development. The Dir comprises the following Sections: Agricultural research and innovation; Education, training and supervision of occupational schools; and, Butchers' schools.

A further problem is that services at all levels are understaffed a phenomenon which is expected to intensify due to the retirement of a large number of agronomists who entered the service in the period 1981 – 1987 and the prohibition of hiring new staff (imposed due to the financial crisis in the 2010s). On top of this, the restriction of travelling by 2/3 further confines agronomists in office and thus curtails the contacts between agronomists and farmers.

Overall, in the last 30 years the need for extension/advisory services has been seriously downplayed as a result of the dominant attitude according to which the absorption of available EU funds (subsidies and grants) overwhelmed 'the need to produce'; in this sense, the scientific support of farmers (being thought of as 'entrepreneurs') was not deemed 'necessary' or was totally left to the market without at the same time any kind of accreditation or controls by an competent authority.

It is only now that some timid steps are undertaken, largely due to the EU legislative framework pressure, to deal with the establishment of (private) extension/farm advisory services the first of which was the accreditation of advisors. Nevertheless it is but clear how these advisors are expected to function; it thus seems possible that accreditation will be used by the RDP Managing Authorities to launch Measure 2 of the RDP and by advisors to have access to it.

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<sup>42</sup> For further details see the PRO-AKIS report for Greece at <https://proakis.webarchive.hutton.ac.uk/inventory/country-reports-%E2%80%93-inventory-akis-and-advisory-services-eu-27>; <https://430a.uni-hohenheim.de/pro-akis>

## 4. The agricultural and forestry advisory service(s)

### *Introduction:*

The survey was based on the instrument (questionnaire) developed by the University of Hohenheim in consultation with project partners; the questionnaire was then translated into Greek by the AUA team. Following, based on the country's AKIS diagram 'representatives' of the main providers of advice to farmers (private advisory/consultancy companies<sup>43</sup>, freelance advisors and consultants; input shops; cooperatives; Development Agencies; and, Dir of Rural Economy & Veterinary) were conducted and asked to contribute to the survey (i.e. to visit the questionnaire at

<https://ec.europa.eu/eusurvey/runner/i2connectAKISsurvey?surveylanguage=EN#page0> and respond to the questions). The AUA team provided assistance whenever needed. Overall 25 questionnaires were completed<sup>44</sup>.

The 25 questionnaires come from all over the country (11 out of the 13 regions – the regions of South and North Aegean islands are not included). Half of the questionnaires come from the two main plain and productive areas of the country i.e. Central Macedonia and Thessaly regions<sup>45</sup>. On the other hand, 2 of the freelance advisors and one Dir of Rural Economy & Veterinary are exclusively working with livestock farmers.

### 4.1. Overview of all service suppliers

As seen in the previous sections, the Greek AFKIS is fragmented and weak. Therefore one can find multiple uncoordinated entities providing farmers with all kinds of advice with the notable absence of the public domain (except for bureaucratic and administrative matters).

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<sup>43</sup> The American Farm School of Thessaloniki (AFS) is included in this category (see: <https://www.afs.edu.gr/>) as, besides being an educational institute, they are also doing advisory work. Due to its distinctive character, when needed, special reference will be made to AFS.

<sup>44</sup> To secure that at least 3 providers from each category would respond to the on-line questionnaire we got in contact with 54 providers across the country. It seems that 3-4 providers although they filled the questionnaire they failed to submit it.

<sup>45</sup> In these two regions almost 40% of the recently accredited (by ELGO DIMITRA) advisors are found; according to the Geotechnical Chambers 30% of the Greek freelance consultants work in these two regions.

In this respect for the present study representatives from all kinds of providers were sought. The providers who participated in the survey are depicted in Figure 1<sup>46</sup>.

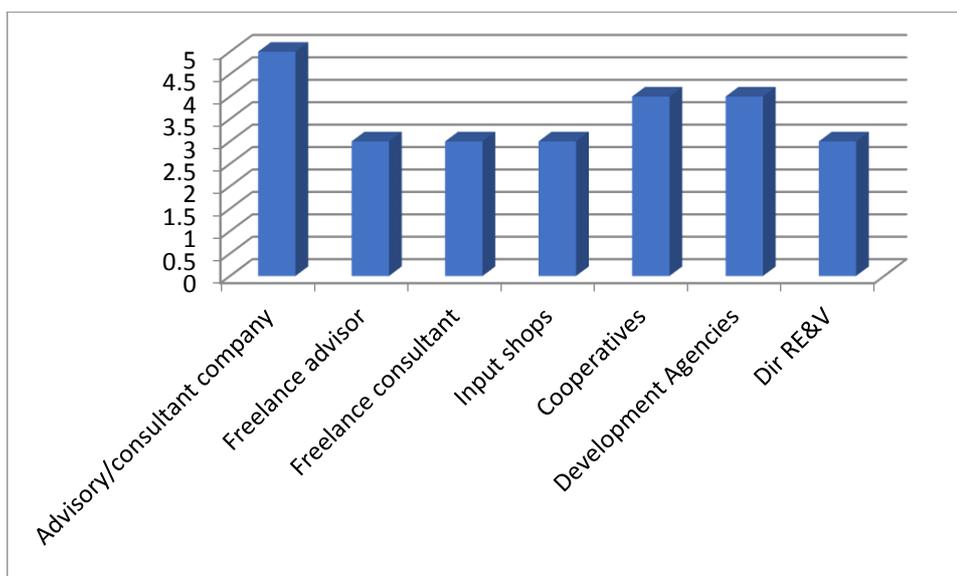


Figure 1: No of participants in the survey per category of advice provider

The Cooperatives, Development Agencies and the Directorates of Rural Economy and Veterinary (Dir RE&V) work at sub-regional/prefectural level and the same is true for the input shops (prefectural/local level).

Half of the freelancers (consultants and advisors) declared that they work at national level with the other half working at sub-regional/prefectural level.

Finally, the private advisory/consultancy companies claim that the scale of their operations is either international (2 cases), national (1 case) or regional (2 cases).

## 4.2. Public policy, funding schemes, financing mechanisms, advisory service providers

In Greece, amidst a weak and fragmented AKIS, there is no coherent policy and thus support for advisory services. Despite the ministerial decision of 2018 for the

<sup>46</sup> The numbers of different categories of providers in the Graph are not representative of the presence of these categories across the country.

establishment of a National Farm Advisory System, thus far only the accreditation of 3,084 advisors (following on-line self-directed training and central exams organized by ELGO DIMITRA) has been attained. Moreover, the Measure 'provision of advice to farmers' (M2 of NRDP) has not been launched yet.

Cost-recovery from farmers (fee for service financing) is the common source of funding for all advisory providers with the exception of the Dir of Rural Economy and Veterinary (public) and Development Agencies (funded mainly through EU and national/regional projects); in the case of cooperatives the cost may be partially covered by EU/national (project) funds or membership fee. Some among advisory companies and cooperatives may also be involved in (and funded by) EU and national projects.

The lack of a public mechanism which would be focused on the provision of extension/ advisory services to farmers results in a situation in which farmers either have to pay for such services or to access/buy 'free' advice through/along with the purchase of inputs s/he buys from a shop<sup>47</sup>.

Among advisory providers, advisory/consultancy companies claim that their budget has increased more than 10% in the last 3 years due to the increase of clients; the same is true for 2 out of the 4 interviewed cooperatives.

### **4.3. Human resources and methods of service provision**

#### ***Human resources***

The number of employees in advisory/consultancy companies (with the exception of AFS) range between 4 and 10 (average: 6) out of whom 4 are advisors (ranging between 3 and 6); on average 1.5 women work as advisors. Cooperatives<sup>48</sup> employ on average 22 persons (ranging between 9 and 30 persons) out of whom 8 are advisors (ranging between 2 and 10); on average 3.5 women work as advisors.

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<sup>47</sup> Research (2005) among rural inhabitants (between 18 and 45 years old) showed the perceived need for extension/advisory services with almost half of the sample farmers claiming that they would be willing to pay for such services. See: Alexopoulos et al. (2009).

<sup>48</sup> In the categories of organizations that follow advisors may well be confused with agronomists working in the organization.

Development Agencies employ on average 26 persons (ranging between 7 and 50 persons) out of whom 8 work (range: from 5 to 10) as advisors equally divided between women and men. The Dir. of Rural Economy and Veterinary employ on average 47 persons (ranging between 20 and 70 persons) out of whom 23 are advisors (ranging between 19 and 30); on average, 9 advisors are women.

Among the 9 interviewed freelancers there is only 1 woman.

Most (4 out of 5) of the advisory/consultancy companies declare increases in their personnel in the past 5 years owing to the increase of their clients. The same is true for half of the interviewed cooperatives while, on the contrary, the personnel in 2 out of the 3 Dir. of Rural Economy and Veterinary since the retired personnel was not replaced (a consequence of the recent economic crisis in Greece).

As far as back-offices are concerned only 3 of the advisory/consultancy companies (1 to 3 persons) and 2 of the Development Agencies (on average 3 persons) claim to occupy personnel in such a task.

### ***Education level of advisors***

In all cases advisors have a bachelor (3-4 years of studies) or an agronomist/engineer degree (5 years of studies). Higher qualifications are mainly found in the Dir. of Rural Economy and Veterinary (on average 2 PhD and 12 MSc) and advisory/consultancy companies (on average 1 PhD and 2 MSc, excluding AFS); Development Agencies and Cooperatives have on average 3 and 2 MSc holders, respectively, in their personnel.

Among the 9 freelancers interviewed only 2 have a MSc degree. All others hold the agronomist/engineer degree.

In only 5 cases (2 companies; 2 Development Agencies; 1 Cooperative) it was said that in order to hire someone organizations require further qualifications, mainly (re: multiple responses) personal and communication skills (2 cases); training in advisory work or adult education (3 cases); relevant experience (1 case); or specialized training/knowledge (1 case).

### ***Professional experience in years***

In all the interviewed organizations the majority of advisors (with the exception of AFS and 1 cooperative) have a working experience exceeding 10 years with the

notable absence of advisors having less than 3 years experience (overall 1 person only). This is especially problematic for the Dir. of Rural Economy and Veterinary due to the abovementioned restriction in hiring new personnel.

Freelancers are also experienced; 7 out of the 9 have professional experience exceeding 10 years. The two less experienced (but with experience more than 3 years) are the MSc holders.

### ***Advisory certification***

All the advisory/consultancy companies (or most of their staff) and 3 out of the 4 cooperatives (or most of their staff) have the Advisory Certification provided by ELGO DIMITRA; two of the freelancers also hold this Advisory Certification.

As mentioned in the description of the Greek FAS, last summer, more than 3,000 advisors have been accredited in the framework of the National Farm Advisory System but the Measure (M2 on FAS) of the RDP has not been launched yet.

The only other staff certifications mentioned concern cross-compliance (1 case) and integrated farming/IPM (1 case); one freelancer also has IPM certification.

## **4.4. Clients and topics**

### ***Clients***

All advisory providers serve quite a number, each, of client groups; only in two cases (one freelancer advisor and one input shop) the clientele is clearly defined. Almost all (23 out of 25) providers support 'farmers with small/medium-scaled farms'; 'farmers with large commercial farms' are clients for less than half the providers (all the advisory/consultancy companies and freelance consultants and few of the rest of the providers). More than half of the providers support farmers groups, young farmers and/or new entrants; women farmers are clients for half of all the advice providers (all advisory/consultancy companies and most of the freelance consultants and cooperatives). Slightly less of the providers support farmers with semi-subsistence farms as well as part-time farmers. The 'SMEs' are served by all the Development Agencies, most of the advisory/consultancy companies and half of the freelancers; 'advisors/consultants' are served by half of the Development Agencies and sporadically by other advice providers with the

exception of Cooperatives and Dir of RE&V. Support to forest owners/managers appears only twice.

One might observe that freelance advisors and input shops have a rather restricted range of clientele as compared to other advisory providers. There is no obvious relationship between client group and advisory activities/topic, as topics do not differ radically between advisory providers (see below).

**Topics**

As seen in Figure 2 (below) the advisory topics are most demanded by clients are: ‘entrepreneurship and farm management’ (20), ‘rural development support and diversification’ (20); ‘support with grant application and compliance with regulation and standards’ (16); ‘agri-environmental stewardship measures and nature conservation’ (12); and, ‘production technologies’ (10).

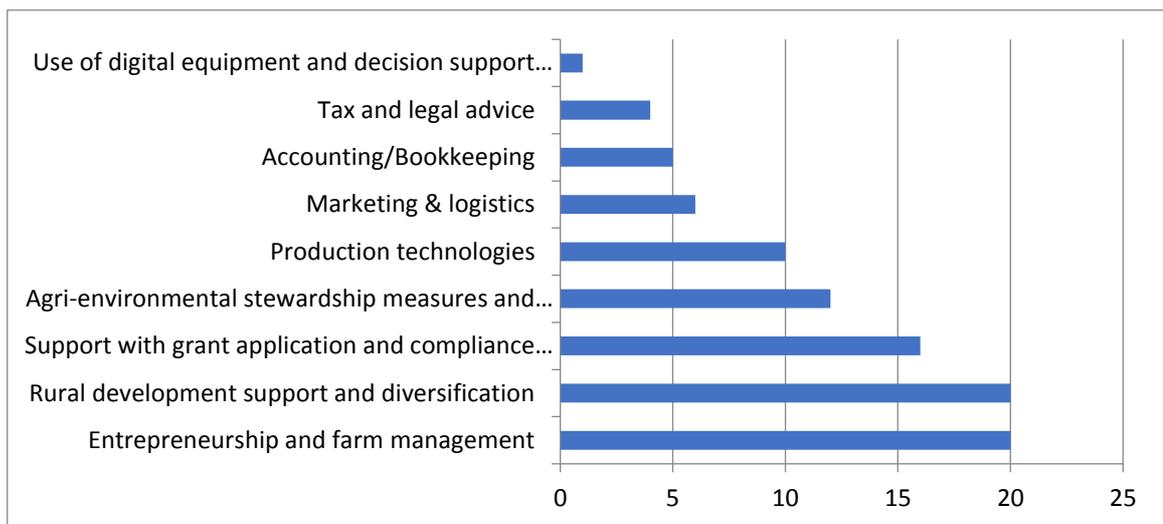


Figure 2: Most demanded, by clients, advisory topics

It is clear that ‘production technologies’ is not a topic for which farmers would ask Development Agencies and to a lesser degree cooperatives and Dir. of Rural Economy and Veterinary; ‘agri-environmental’ is not a topic for which farmers would ask Development Agencies and most among the freelancers (advisors or shops). Freelance advisors and shops as well as half of the Development Agencies are not the place where farmers ask about ‘support with grant application and compliance with regulation and standards’.

The number of clients ranges between 20 and 1,000 farmers. The Dir. of Rural Economy and Veterinary claim on average around 370 farmers/clients (ranging from 200 to 1,000) followed by advisory/consultancy companies with an average of around 350 clients (ranging from 60 to 1,000). Freelancers' (consultants or advisors) clientele ranges from 20 to 300 with an average of 125 clients. Shops appear to have more clients than freelancers (average: 180 farmers). The data for Development Agencies and Cooperatives are not consistent as they address different clienteles (municipalities, etc.) as well.

Advisory activities revolve mainly around 'consultancy and backstopping' for advisory/consultancy companies (4 out of 5 also mention 'training and capacity building'), and 'creating awareness and facilitating exchange of knowledge; consultancy and backstopping' for the rest of the providers. Only Development Agencies consistently refer to 'networking/ facilitation/ brokerage' and 'enhancing access to resources' among their activities.

Only in 5 cases outsourcing is mentioned. These mainly concern constructions and cases in which the organization is under considerable pressure (to support clients) or deals with something totally new (for example, Farmer Field Schools).

### ***Advisory methods***

The most frequently used advisory methods are the individual ones (see Figure 3). This is especially true for all freelancers – consultants, advisors and shops (between 70% and 100%; average 90%), and advisory/consultancy companies (between 45% and 90%; average 77%). Individual methods account for 68% of the methods used by Dir. of Rural Economy and Veterinary, 65% for cooperatives, and 50% for Development Agencies. On the other hand, Development Agencies use group and mass methods to quite some extent (23% and 27%, respectively), followed by cooperatives (14% and 21%, respectively) and Dir. of Rural Economy and Veterinary (13% and 15%, respectively). Advisory/consultancy companies use group and mass methods in a restricted manner (around 11% each category).

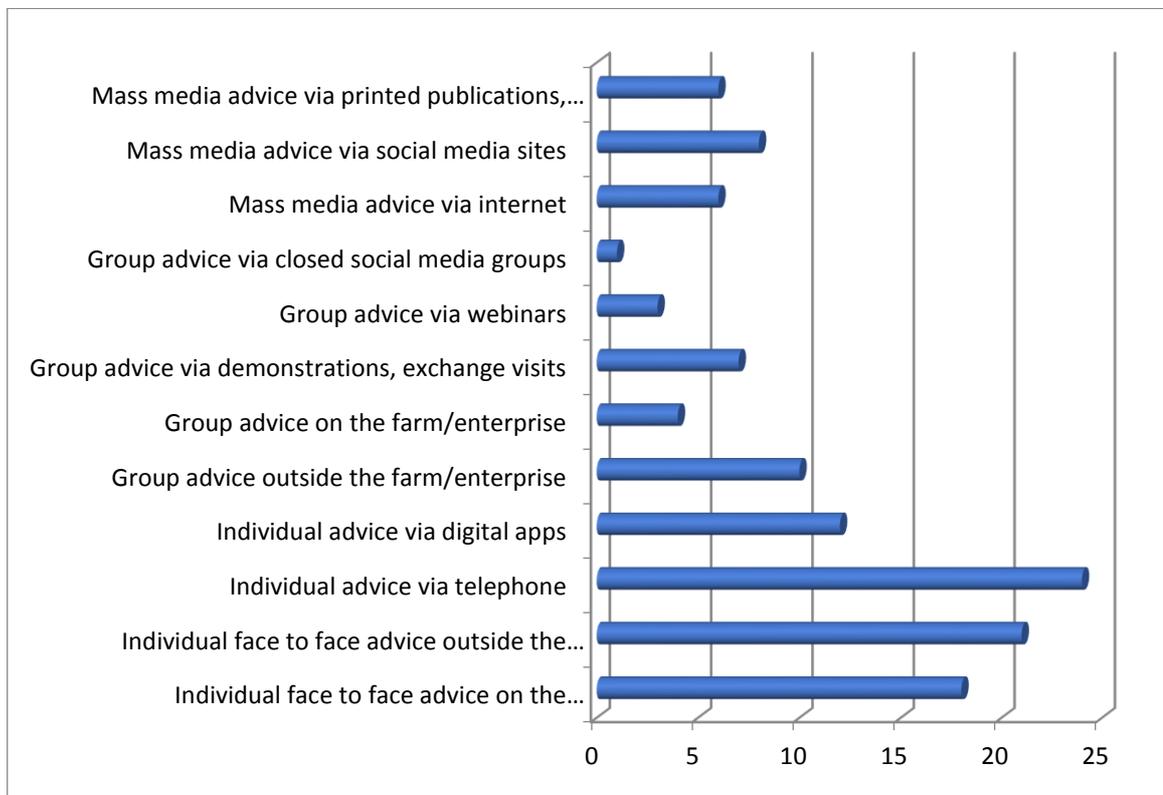


Figure 3: Most frequently used advisory methods

Face-to-face advice (either outside or on-farm) and advice via telephone were mentioned by more than half of the interviewees; when Individual advice via digital apps is added to these, then all individual methods account for more than 60% of the methods mentioned. Individual methods predominate among freelancers (78%) as well as companies/organizations (56%). Group methods are used by companies/organizations much more than by freelancers (26% vs. 8%, respectively); most of them are non-digital (21% and 8%, respectively). Digital mass media account for around 11% (companies/organizations) to 14% (freelancers) of the methods used; the more traditional mass media are used only by companies/organizations (7% of all the methods used), half of which are advisory/consultancy companies. On average, freelancers use fewer methods as compared to companies/organizations (4 vs. 5, respectively); five providers (2 cooperatives, 2 Dir of Rural Economy and Veterinary and 1 advisory/consultancy company) do not use any digital means to contact/advice their clients.

Half (13 advisory providers, dispersed in all categories) state that the way to provide advice has changed due to the covid-19 pandemic. In all cases but two (in which increased telephone contacts are reported as the means to provide advice

replacing face-to-face contacts) advice is provided to a larger extent through the use of new technologies (internet and apps; in two cases both telephone and new technologies are used).

## 4.5. Linkages with other AKIS actors/knowledge flows

As seen in Figure 4 (below) advisory/consultancy companies have medium-to-strong links with public administration (2.40<sup>49</sup>) and FBOs – professional organizations (2.40) and medium links with other similar companies (2.0).

Freelancers, with the exception of consultants who have medium-to-strong links with public administration (2.33) due to the nature of their work, do not have noticeable (medium or more) links with other AKIS actors.

Cooperatives have medium-to-strong links with FBOs – professional organizations (2.75) and public administration (2.50).

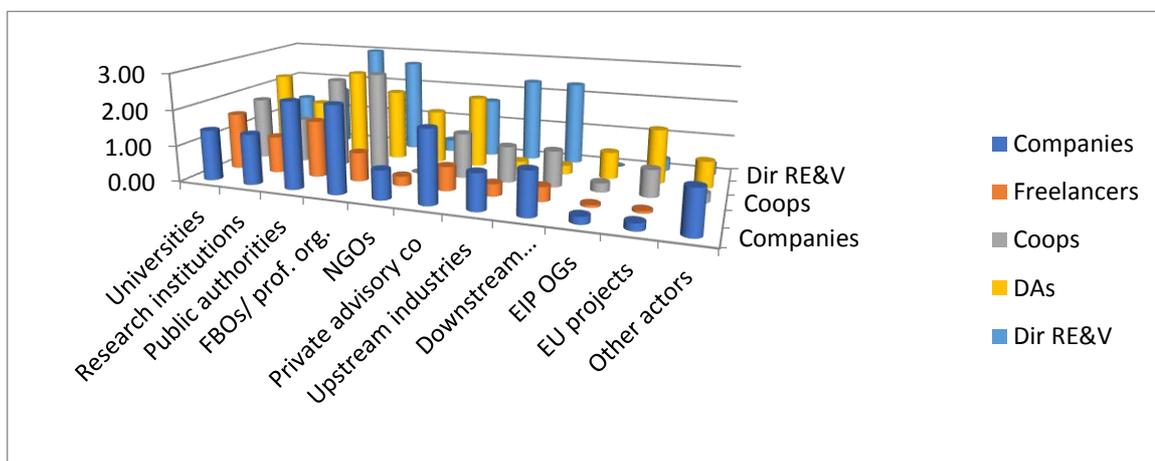


Figure 4: Degree of cooperation of advice providers with other AKIS actors  
MEMO: 0= no cooperation; 1= weak cooperation; 2= medium cooperation; 3= strong cooperation.

Development Agencies have medium-to-strong links with public administration (2.50) and universities (2.25) followed by medium links with FBOs – professional organizations (2.00) and private companies such as consultancies, advisory organisations, etc. (2.00).

<sup>49</sup> For these calculations it is assumed that: no cooperation = 0; weak cooperation = 1; medium cooperation = 2; and, strong cooperation = 3.

Finally the Dir of Rural Economy and Veterinary have strong links with public administration (3.00) and FBOs – professional organizations (2.67) and medium-to-strong links with industries, either upstream or downstream (2.33 each).

## 4.6. Programming and planning of advisory work

Two of the advisory/consultancy companies along with 1 cooperative and 1 Development Agency declared that they have staff development strategy. In two cases (1 company and 1 coop) it concerns training on precision agriculture; the other two cases refer to the fact that the organization facilitates its staff to undertake postgraduate studies, attend seminars and conferences, etc.

Only two organizations (1 advisory company and 1 coop) said that they have a trainer/training unit. In another company the sections' directors take care of their staff training; in 1 DA training takes place through the participation in projects (with research centers and universities); 1 coop said that each of its agronomists attends at least one seminar per year; finally 1 Dir of Rural Economy and Veterinary mentioned that staff can attend courses provided by the National Centre for Public Administration & Local Government (EKDDA).

In all cases training is said to last between one and two weeks.

In 3 out of the 5 advisory/consultancy companies attending training implies economic rewards (salary raise or bonus); in another one they have a competition (with economic reward) of the employee of the year. In 1 DA training is a component of the annual staff evaluation.

### *Time allocation for advisory work*

All organizations, except the Dir of Rural Economy and Veterinary (see Figure 5, below), provide targeted services to (on average) similar degrees (from 42% for DAs and Coops to 44% for companies). The other most important (on average) activity in all categories of organizations is 'information dissemination - face to face, via digital tools': companies (20%), cooperatives (41%), Development Agencies (18%) and Dir of Rural Economy and Veterinary (40%). Finally, important for companies are 'teaching and training activities' (12%, largely owing to AFS) and 'further development of one's knowledge and skills' (10%).

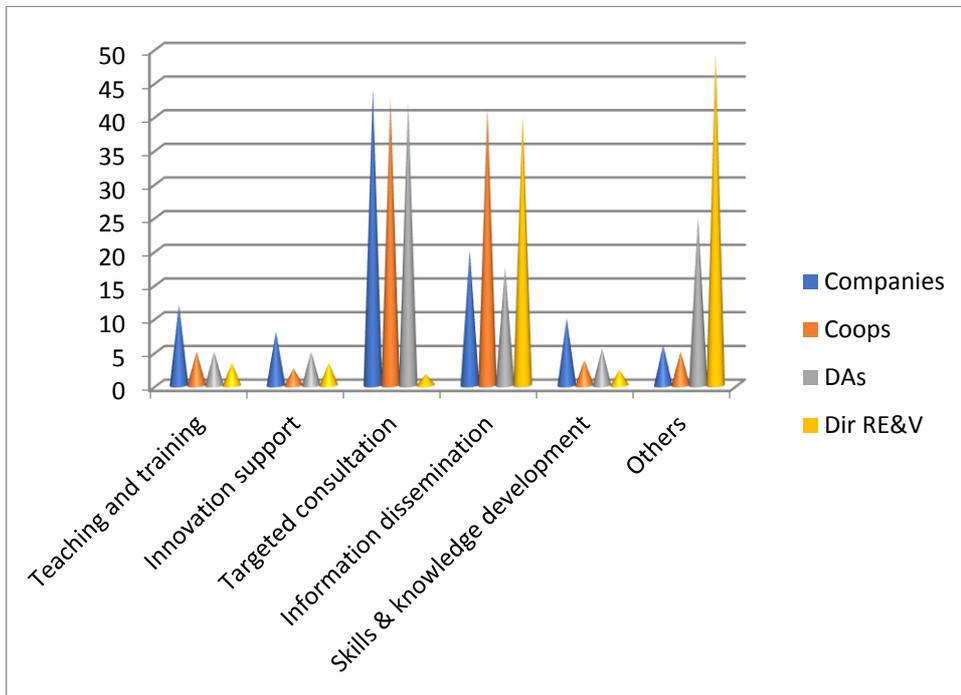


Figure 5: Allocation of advisors' time (%) in various activities

Other activities refer to project work and studies/plans (DAs and companies) and administrative/ bureaucratic tasks (almost 50% of the time, for Dir of Rural Economy and Veterinary).

#### 4.7. Advisory organisations forming the FAS and evaluation of their FAS implementation

Overall, 9 among the 16 interviewed organizations (3 out of 5 companies, 3 out of 4 coops, 1 out of 4 DAs and 2 out of 3 Dir RE&V) state that advice concerning the cross-compliance requirements (re: EU-FAS) is embedded in their other advisory activities<sup>50</sup>.

<sup>50</sup> Here is must be noted that the implementation of the RDP Measure concerning FAS in Greece has been either a failure (2007-2013) or not activated thus far (2014-2020). For the former see: Koutsouris (2014a).

## 5. Summary and conclusions

The Greek Extension Service (Ministry of Agriculture; nowadays, Ministry of Rural Development & Food) has, during the last three decades, been in a painful process of bureaucratisation leading to its absence from the rural development field. This largely owes to the fact that following the accession of Greece into the EC (1981), the administrative burden of the Common Agricultural Policy (CAP) implementation was designated to the Extension Service. However, no major functional re-structuring of the Service took place; thus, extensionists were ensnared in a bureaucratic-administrative role. Extensionists became more than ever severely restricted vis-à-vis the provision of advice to Greek farmers; information was provided to those of the farmers who actively sought for it albeit in a rather fragmented, inadequate and inefficient manner. Furthermore, changes, which took place in the mid 90s, such as the Ministry divisions' restructuring, the decentralisation of services and the establishment of semi-autonomous organisations for training and research respectively did not yield any substantial positive effects and did not make extension services more flexible and relevant to the needs of farmers.

Such a situation has been verified by a number of studies which have attempted to explore both farmers' perceptions about the Service's interventions and the intervention policy and practice of the Service. For example, Koutsouris and Papadopoulos (1998) have criticized the mainly bureaucratic role of public agronomists given that they have abolished their advisory role due to their involvement in controlling the implementation of Regulations and farmers' applications for subsidies and compensations, often creating a tension between extensionists and farmers. In this respect, Kaberis and Koutsouris (2012), Pappa and Koutsouris (2016) and Charatsari and Lioutas (2019) point to the negative perceptions of Greek farmers vis-à-vis public agronomists who are nowadays conceived of as 'bureaucrats' not serving farmers' interests. Such an inefficient and inadequate advisory function is found to be a key factor with respect to the current socioeconomic and environmental problems facing the Greek agriculture while also eliminating farmers' willingness to engage in public extension activities.

The vacuum created due to the weakness of the public as well as of farm based organizations to provide efficient advisory services to farmers is covered, locally, by private agronomists - consultants and input suppliers (Kaberis and Koutsouris,

2012). Private consultants mainly support farmers interested in having access to EU programmes so their scope is rather limited. Input suppliers/retailers (private agronomists) provide advice for free in the framework of their commercial activity. Their shops are the main points where farmers seek and obtain free information on inputs and technical requirements; shops, in turn, generate income from the trade of inputs. On the other hand, the potential conflict of interest arising from the involvement of private agronomists (input providers) in the provision of advice has been clearly pointed out (Michelsen et al., 2001; Dinar et al., 2007; Kaberis and Koutsouris, 2012; Pappa and Koutsouris, 2016).

Private agronomists/companies also support producers' groups mainly in the framework of Integrated Production schemes, thus constituting an exemption to the general "rule", according to which technical advice is not paid, since in their case the provision of advice is their exclusive job.

Overall, quite a number of papers in journals and international conferences in the last couple of decades (see, inter alia, Koutsouris and Papadopoulos, 1998; Koutsouris, 1999; Michelsen et al., 2001; Gidakou et al., 2006; Dinar et al., 2007; Alexopoulos et al., 2009; Charatsari et al., 2011; Kaberis and Koutsouris, 2012; Koutsouris, 2014a; Pappa and Koutsouris, 2016; Österle et al., 2016; Charatsari and Lioutas, 2019; Koutsouris and Zarokosta, 2019; Lioutas et al., 2019; Zarokosta and Koutsouris, 2019) as well as two PhD theses in the Dept of Agr. Economics & Rural Development, AUA (Papaspyrou, 2016; Sergianni, 2019) have pointed to the negative consequences in the Greek farming sector due to the lack of an extension/advisory mechanism and, in general, the weak and fragmented Greek AKIS.

Indeed, as shown in the framework of the "Prospects for farmers' support: Advisory services in European AKIS (PRO-AKIS)"<sup>51</sup> project (FP7-EU) the Greek AKIS (Koutsouris, 2014b) was found to be 'weak and fragmented' in the sense that

*"In a strong AKIS, there are influential actors or organisations at national level that support (parts of) the knowledge system. 'Strong' also indicates that dedicated resources are allocated to the AKIS, for example public investment is available to enhance advisory services, knowledge production and exchange. Finally, in a*

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<sup>51</sup> <https://430a.uni-hohenheim.de/pro-akis>; <http://proakis.webarchive.hutton.ac.uk/>

strong AKIS there would be evidence that farmers are being reached by and benefit from advisory services. A weak AKIS would be lacking of these features.

The 'level of integration' refers to the formal links between AKIS actors. A fragmented AKIS is characterised by several independent knowledge networks that operate in parallel. They are typically not well coordinated, rarely cooperate and even might compete. An integrated AKIS features a coordinating structure, often a public body, and the system is supported by national policies on AKIS and advisory services that frame the (inter)actions of AKIS actors. In addition, in an integrated AKIS there is evidence of linkages between various actors."<sup>52</sup>

This has been illustrated in the following Figure 6.

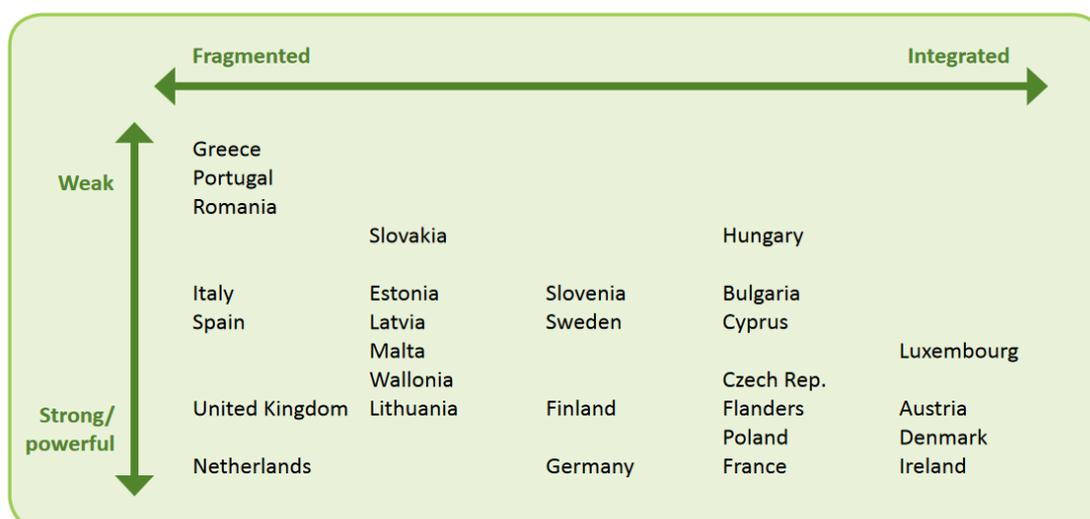


Figure 6: The European AKIS

Seven year later, the updated version (2020) was elaborated in the framework of the i2connect H2020 project. This was attained based on an updated version of the PRO-AKIS diagram prepared by the AUA research team and discussed in depth with 15 key-informants<sup>53</sup> based on the interview guide prepared by the University of Hohenheim. The final 2020 AKIS diagram shows a largely similar picture of the Greek AKIS and extension/advisory services as the 2013 one.

<sup>52</sup>

[https://proakis.webarchive.hutton.ac.uk/sites/proakis.hutton.ac.uk/files/AKIS\\_characterisation\\_briefing\\_final.pdf](https://proakis.webarchive.hutton.ac.uk/sites/proakis.hutton.ac.uk/files/AKIS_characterisation_briefing_final.pdf)

<sup>53</sup> Based on the interview guides provided by the H2020 projects i2connect (<https://cordis.europa.eu/project/id/863039>) and AgriLink (<https://www.agrilink2020.eu/>).

Indeed all the interviewees underlined that in the country AKIS is not coordinated and it is rather 'extreme (wishful thinking)' to characterise the situation as 'as system'; this is so given the fragmentation, complexity ('labirinthine situation') and ineffectiveness that currently predominate and 'do not help those who wish to get involved in farming'. The interviewees stressed the 'obvious lack' of links between various actors which, among others, results in 'overlapping jurisdictions/mandates or contradictory duties' as well as 'lack of both theoretical background and practical orientation'. According to the interviewees the interactions that occur as largely 'occasional/ opportunistic'; the interviewees thus claimed there is 'plenty of room for improvement' as well as that 'efforts are currently made'. The latter owes to the fact that in the framework of the CAP Strategic Plan currently designed in Greece (and all over the EU) the (re-)structuring of AKIS and within it of advisory services is obligatory.

In conclusion, all sources of information (papers, projects, reports, key-interviewees) and the data collected through the i2connect project survey (see Section 4) point to the same picture: multiple actors claim/ compete for the 'advisory field' (quite sometimes having in mind the funds that are/ should be available in Measure 2 of the RDP) albeit with minimal links between them, no back-office function or support/ links, addressing very wide ranges of potential clienteles and largely funded through fees and with a largely top-down ethos. Thus large groups of farmers are not served or are served through non-impartial input shops with regard to their pressing everyday needs<sup>54</sup>, and opportunities concerning for example the establishment of an advisory system, running bottom-up projects (interactive innovation) etc. have been/are missed. Nowadays, many are looking to the design of the CAP Strategic Plan (2021-2027) as an opportunity to mitigate some of the negative aspects and consequences of the weak and fragmented Greek AKIS.

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<sup>54</sup> This is further verified by the Greek case studies of the H2020 projects AgriSpin (<https://agrispin.eu/reports/>) και AgriLink (<https://www.agrilink2020.eu/>).

## 6. Acknowledgement of partners, information sources and gaps

The AUA team wishes to acknowledge the cooperation of the interviewed key-persons concerning the Greek AKIS as well as of the advice providers who responded to our call to answer the on-line questionnaire.

### List of key-interviewees

1	Maria Christina Makrandreou – Head of the National Rural Network
2	Athanasios Theodoropoulos - Managing Authority of the GREEK RDP
3	Demetrios Vacamis – Head of Agro Q (independent advisory company)
4	Antonis Andronikakis – Journalist at the farmers journal “Ypaithros Chora”
5	Apostolos Polymeros – Gen. Director, Ministry of Rural Dev. & Food
6	Nikolaos Pavlonassios - representative of PENA, the Young Farmers’ Union
7	Zografakis Stavros - Vice-Rector, President of the Research Committee of the Agricultural University of Athens
8	Spyridon Mamalis - President, Geotechnical Chambers of Greece
9	Nikolaos Stoupis - Managing Director at Agricultural Innovation; Former Gen. Secretary of the Ministry of Rural Development & Food
10	Francesca Ydraiou – Director, Greek Crop Protection Association
11	Elli Tsiforou – Gen. Dir. of GAIA Epicheirein
12	Paul Satolias – President of New PASEGES (Farmers’ Union)
13	Panagiotis Chatzinikolaou - Managing Director of the Hellenic Agricultural Organization Demeter (ELGO DIMITRA)
14	Kostas Tsiboukas – Dean of the School of Applied Economic & Social Sciences, Agricultural University of Athens; Former President of NAGREF (nowadays part
15	Vasilis Bellis – Gen. Dir. of the Development Agency of Karditsa S.A. O.T.A.

### List of survey participants

	Advisory/ consultancy companies
1	AgroCon, <a href="https://www.agrocon.gr/">https://www.agrocon.gr/</a>
2	SYPA consultants, <a href="http://www.sypa.gr">www.sypa.gr</a>
3	InfoAgro, <a href="https://www.infoagro.gr/">https://www.infoagro.gr/</a>
4	GP&A Consulting & Planning, <a href="http://www.gp-a.gr/">http://www.gp-a.gr/</a>
5	American Farm School of Thessaloniki, <a href="https://www.afs.edu.gr/">https://www.afs.edu.gr/</a>
	Freelancers - advisors
6	I. Konstantopoulos, <a href="mailto:info@gp-a.gr">info@gp-a.gr</a>
7	D. Sotiropoulou Consultants, <a href="http://www.geo-aitol.gr">http://www.geo-aitol.gr</a>
8	S. Papasotiriou, Rural Dev. Consultants, <a href="http://www.spapasotiriou.gr">www.spapasotiriou.gr</a>
	Freelancers - consultants
9	INNOVact, Business Consultants, <a href="https://www.innovact.gr/en/">https://www.innovact.gr/en/</a>
10	does not wish to disclose his/her data*
11	does not wish to disclose his/her data*
	Input shops
12	E.G.I.S./AssosSeeeds, <a href="https://www.assosseeds.com/index.php?lang=129&amp;mpage=1">https://www.assosseeds.com/index.php?lang=129&amp;mpage=1</a>
13	AGROPLACE, <a href="https://www.agroplace.gr/profil-3/">https://www.agroplace.gr/profil-3/</a>
14	GEOFORIA, <a href="http://www.geoforia.gr">www.geoforia.gr</a>
	Cooperatives
15	EAS Thessalonikis, <a href="https://www.easth.gr/">https://www.easth.gr/</a>
16	General Agricultural Coop of Ioannina, <a href="http://www.enosiagroton.gr/">http://www.enosiagroton.gr/</a>
17	Orealios Gaea - wine growers of Robola, Cephalonia, <a href="https://www.orealios.gr/en/">https://www.orealios.gr/en/</a>
18	EAS Arkadias, <a href="https://www.easarcadias.gr/index.php/el/">https://www.easarcadias.gr/index.php/el/</a>
	Development Agencies/ LAGs
19	Pelio Development Co. S.A., <a href="https://eapilio.gr/">https://eapilio.gr/</a>
20	Regional Development Agency of Western Macedonia S.A. O.T.A., <a href="http://anko.gr/index.php/en/">http://anko.gr/index.php/en/</a>
21	Development Agency of Karditsa S.A. O.T.A., <a href="http://www.anka.gr">www.anka.gr</a>
22	Development Agency of Larisa S.A. O.T.A., <a href="http://aenol.gr/">http://aenol.gr/</a>
	Dir of Rural Economy & Veterinary
23	Dir of Rural Economy & Veterinary of Drama, <a href="mailto:daokdr@pamth.gov.gr">daokdr@pamth.gov.gr</a>
24	Dir of Rural Economy & Veterinary of Larisa, <a href="mailto:d.pihlivas@thessaly.gov.gr">d.pihlivas@thessaly.gov.gr</a>
25	Dir of Rural Economy & Veterinary of Pieria, <a href="mailto:daokdr@pamth.gov.gr">daokdr@pamth.gov.gr</a>

\* Data known at the AUA team

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# AKIS and advisory services in *Hungary*

## Report for the AKIS inventory (Task 1.2) of the i2connect project

*Date: January, 2020*

**Authors:**

Gáborné Jakab Ágnes,  
Varga Zsuzsanna,  
Vér András

**Contact:**

[jakab.agnes@nak.hu](mailto:jakab.agnes@nak.hu)

This report is still a work in progress.  
The authors thank Erika Székely for valuable comments.

Project funded under the Horizon 2020 Research and Innovation Programme  
under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION 'HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

The study contains the general characteristics of the Hungarian agricultural and forestry sector and AKIS as well as the historical development of the advisory system. The organizations providing advisory services, policy issues, methods of knowledge transfer as well as the advisory organizations that make up the FAS and their operation are presented in detail.

The authors define AKIS as a system that connects people and institutions to promote mutual learning and to produce, share and use technologies, knowledge and information related to agriculture. The system integrates farmers, advisors, educators in agricultural education, researchers and other actors who generate, share and use knowledge and information from different sources to operate and develop the agricultural sector. This relationship system is shown in the AKIS diagram.

The Hungarian AKIS has a rather heterogeneous structure. In addition to the various ministries, actors in the advisory system, participants in education and research, professional chambers, advocacy organizations, farmers' organizations, media and information channels, NGOs and various EU networks play a decisive role. The Hungarian Chamber of Agriculture plays a key role in AKIS, especially in the field of protection of farmers' interests, as well as in the generation and dissemination of information. Advisory services, which are brought together by the National Advisory Centre (OSzK), have a prominent role in the transfer of knowledge and the practical application and dissemination of innovations. OSzK plays a coordinating, recording and controlling role within the framework of the Hungarian Farm Advisory System, among its tasks and actors.

According to the register, 1,100 advisors provide advisory services in Hungary, and it is important to note that the Hungarian Chamber of Agriculture employs 610 village agronomists, who, among other things, provide information and help chamber members regarding issues related to their activities. Agricultural advisory activity has a long tradition in Hungary and the quality and methodology of knowledge transfer has developed dynamically in recent years as well. The advisory system has undergone significant changes in recent decades.

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## Abbreviations

AGRYA	Association of Young Farmers
AKIS	Agricultural Knowledge and Innovation System
AM	Ministry of Agriculture
ATK	Agricultural Research Centre
COPA-COGECA	Committee of Professional Agricultural Organisations and General Confederation of Agricultural Cooperatives of the European Union
DélKerTÉSZ	Southern Plain Gardeners' Cooperative
EIP-AGRI	European Innovation Partnership "for Agricultural Productivity and Sustainability"
Szolgáltató Pont	Service Point (SP)
Operatív Csoport	Operational Group (OG)
Fókusz Csoport	Focus Group (FG)
ELKH	Eötvös Loránd Research Network
EMMI	Ministry of Human Resources
EMVA	European Agricultural Fund for Rural Development (EAFRD)
ENRD	European Union Rural Development Network
ENSZ	United Nations Organization
ESzNR	Advisors' Electronic Directory Management System
EUFRAS	European Forum for Agricultural and Rural Advisory Services
EU	European Union
FAR	Adult Education Data Supply System
FAS	Farm Advisory System
Fruitveb	Hungarian Fruits and Vegetables Inter-professional Organization and Product Council
HOI	Herman Ottó Institute Nonprofit Ltd.

ITM	Ministry of Innovation and Technology
KAP	Common Agricultural Policy
KFI	research-development and innovation
KGNH	National Office for the Circular Economy
KISLÉPTÉK	National Association of Interest Representations for Small-scale Producers and Service Providers
LEADER	Community initiative in rural economic development
MÁOK	Hungarian Veterinary Chamber
MNMNK	Hungarian Chamber of Professionals and Doctors of Plant Protection
MNVH	Hungarian National Rural Network
MSTSZ	Hungarian Association of Pig Breeders and Pig Farmers
MSZR FAS	Farm Advisory System
MTA	Hungarian Academy of Sciences
MTMT	Hungarian National Scientific Bibliography
NAIK	National Agricultural Research and Innovation Centre
NAIK-AKI	NAIK-Agricultural Research Institute
NAK	Hungarian Chamber of Agriculture
NAKVI	National Agricultural Advisory, Educational and Rural Development Institute
NATaB	National Agricultural Advisory Committee
NÉBIH	National Food Chain Safety Office
NKFIH	National Research, Development and Innovation Office
NKIB	National Research Infrastructure Committee

NRN	Hungarian National Rural Network
OECD	Organization for Economic Cooperation and Development
OMÉK	National Agricultural and Food Exhibition and Fair
OSZK	National Coordination Centre of Advisory Centres
ÖK	Centre for Ecological Research
ÖMKi	Research Institute of Organic Agriculture
PREGA	Precision Farming Conference and Exhibition
REL	Short Supply Chain
RSzK	Regional Advisory Centre
SEASN	South Eastern Europe Advisory Service Network
SZBK	Szeged Biological Research Centre
SCAR AKIS SWG	Strategic Working Group on Agricultural Knowledge and Innovation System of the Standing Committee on Agricultural Research
SZE	Széchenyi University
SZIE	Szent István University
SzSzK	Professional Advisory Centre
TSzK	Territorial Advisory Centre
Visegrád Group	Visegrad Cooperation
VP	Rural Development Programme
WFO	World Farmers' Organization
GDP	Gross Domestic Product
KSH	Central Statistical Office

## 1. Main structural characteristics of the agricultural and forestry sector

### General information about Hungary

Hungary is located in Central Europe, in the middle of the Carpathian Basin. It is bordered on the north by Slovakia, on the northeast by Ukraine, on the east and southeast by Romania, on the south by Serbia and Croatia, on the southwest by Slovenia and on the west by Austria. It covers an area of 93,030 square kilometres and has a population of 9.937 million, making it one of the medium-sized and medium-populated Member States of the European Union. Its capital and most populous city is Budapest with 1.794 million people (KSH, 2018). Hungary is home to the world's largest thermal water supply, the world's second largest thermal lake (Lake Hévíz), the largest lake in Central Europe (Lake Balaton) and the largest grassy plain in Central Europe (Hortobágy). The most important natural treasure of the country is arable land. 70% of its area is suitable for agricultural use, of which 72% is arable land. Hungary belongs to the Danube catchment area, the axis of its water network is the Danube River, the total length of which is 2,850 km, of which the length of its main branch in Hungary is 417 km. The climatic areas of Hungary are eastern wet continental, western oceanic, northern arctic, and south-southwest Mediterranean. According to the 2018 data of the Central Statistical Office (KSH, 2019), the average annual temperature is 8-11 °C, with relatively high fluctuations of 20-25 °C. The number of hours of sunshine per year is between 1,750 and 2,200. The average annual rainfall is 500-900 mm. 20% of the country's territory is covered by forests. To protect the flora and fauna, 10 national parks, 38 landscape protection areas, 142 national nature reserves, a natural monument and 1,125 nature reserves protected by local governments have been established in the country so far, on a total of 816,008 hectares.

**Economic performance, investment:** According to the 2020 publication of KSH, in the two years following the economic crisis, the Hungarian economy was characterized by a small, basically export-led recovery. This came to a halt as a result of the 2012 European recession, but in 2013-2019 the performance of the economy grew at a rate exceeding the EU-28 average. Domestic demand played a significant role in this, given that the financial situation of households improved significantly, consumption picked up and the number of investments increased

dynamically. On the production side, market-based services have become the driver of growth. In addition, in 2019, the performance of industry and construction also contributed significantly to the GDP growth of 4.9% which is outstanding at EU level. GDP per capita was USD 16,148 in 2019 (56<sup>th</sup> in the world). After several years of decline and stagnation, the volume of investments has expanded significantly since 2013, despite the temporary decline in 2016, and in 2019 it rose to its highest level ever.



Figure 1 The geopolitical location of Hungary. Source: Europe map study (2020)

**Digital society:** In Hungary, 86% of the population aged 16-74 has already used the Internet during their lives. The Internet access of Hungarian households, which is similar to that of the Visegrad countries, is constantly rising, but is still below the EU average. In 2019, only 45% of households in the lower income quarter were able to connect to the World Wide Web, which was well below the EU average. In the upper quarter, there was little difference between the domestic and EU averages (96% and 99%, respectively).

**Education:** In Hungary, in the 2019/2020 academic year, 1.7 million people took part in full-time training in public education and higher education at different levels (this represents a decrease of 0.2% compared to 2018 and 13% compared to 2010). The number of pre-school children and higher education students increased, while that of primary school and secondary school students decreased. The participation rate of the 3–22 age group in full-time public and higher education has stagnated in recent years, in 2019 it was 81%.

**Labour market:** The number of employees increased steadily between 2011 and 2018, exceeding 4.5 million in 2019. Among those aged 15-64, the employment rate rose to 70.1% and the unemployment rate fell to 3.5%.

Increasing investment in **research, innovation**, infrastructure and skills is important for improving productivity and long-term growth that benefits society as a whole. The ratio of public and private investment to GDP is high, but its composition could be better targeted at increasing productivity. Research and innovation capacities need to be expanded to improve moderate innovation performance. Territorial inequalities could be alleviated by improving infrastructure and public services in disadvantaged areas. In Hungary, investment in skills, education and training is essential in order to boost future economic growth (assessment under Regulation (EU) No 1176/2011, 2019 Country Report - Hungary).

## Presentation of the Hungarian agricultural sector

Agriculture is an extremely important sector of the national economy in terms of food supply for the population, which has been further strengthened by the restrictive measures caused by the COVID 19 pandemic. In Hungary, the proportion of agricultural areas, and especially that of arable land, is high in international comparison too. According to the data of KSH, 58% of the country's territory, i.e. 5.3 million hectares, is under agricultural cultivation. The Hungarian agriculture has been steadily accounting for about 2% of EU agricultural output and value added for years, while its share of factor income is higher, at 2.3-2.4%. The country's agriculture has developed significantly since the EU accession (2004), and its efficiency, competitiveness and profitability have begun to catch up with those of the old Member States.

According to the statements of KSH, the growth of agricultural output, which has been going on since 2010, continued in 2019, reaching another record with HUF 2,789 billion. The volume of gross value added decreased by 1.6%, but at current prices it was 3% higher than in the previous year. The profitability of agriculture at the sector level has also improved, with factor income rising by 2.9% in 2019. Foreign trade in agricultural and food products contributes greatly to the positive balance of the national economy year by year, therefore, its macroeconomic

significance is decisive. The assets of the national economy amounted to EUR 4,854.7 million, to which agricultural foreign trade contributed EUR 3,108.7 million in 2019. In 2019, the value of total national exports in euros increased by 3.9% and imports by 4.8% compared to the previous year. Agricultural exports increased by 8.2% and agricultural imports by 8.1% compared to 2018. The share of agricultural exports in the total exports of the national economy increased, mainly due to the increase in exports of cereals, oilseeds and processed feed.

Employment in agriculture (in line with the significant labour shortage and the ongoing transformation of the farm structure) declined in 2019. The number of people employed in agriculture, forestry and fishing was 210.7 thousand in 2019, representing a decrease of 2.0% compared to the previous year. Employment in the sector increased by 3.7% altogether between 2015 and 2019. The number of people employed in the food industry increased in 2019. Food enterprises employed 145.1 thousand people in 2019, which means 1.1 thousand people or 0.8% more than in 2018.

Due to the varied local conditions, field crop production is very diverse, but the role of cereals and oilseeds is decisive. The use of arable land in Hungary is concentrated, almost half of which is occupied by wheat and corn (2018), while farmers grow sunflower and rapeseed on 21.9% of the arable land. In 2018, the share of the main crops (wheat, corn, barley, sunflower, rapeseed) in the total arable land was 72.8%.

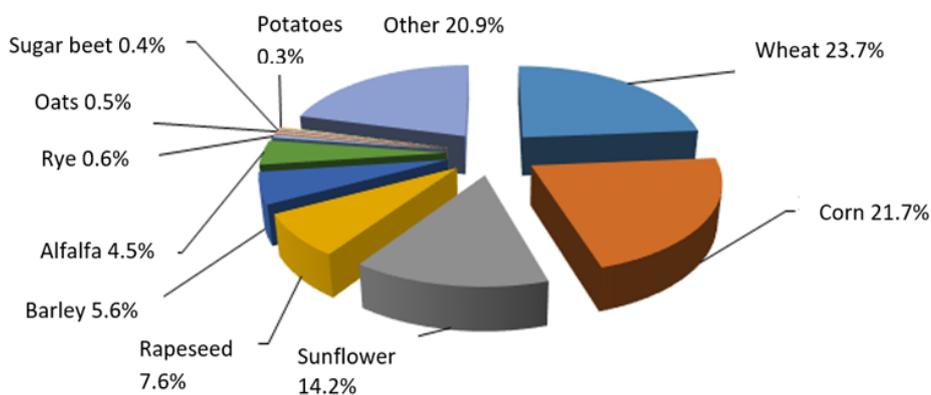


Figure 2 Ratio of the harvested area of some arable crops to arable land in 2018. Source: Central Statistical Office (2020)

Wheat yields exceeded 5 million tons for the seventh year in a row, amounting to 5.4 million tons in 2019. The yield of corn was very favourable at 8.1 million tons. The area and yield of sunflower (1.7 million tons) was 7% lower than in the previous year. The yield of rapeseed fell short of the record of 2018 with 896 thousand tons harvested in 2019.

Hungary has good conditions for feed production and animal husbandry, therefore, animal husbandry traditionally plays an important role in the Hungarian agriculture. The most important animal species are cattle, pigs, poultry and sheep. According to the data of the Central Statistical Office, the gross output of live animals and animal products at current basic prices was HUF 943 billion in 2018, their production accounted for 35.3% of agricultural output. In 2018, the volume of output was 5.7% higher than in the previous year. Output from poultry increased by 13%, from cattle, by 7% and from pigs, by 3%.

In 2018, the number of cattle was 884.8 thousand and that of cows was 402.8 thousand in Hungary. The former increased by 15 thousand and the latter by 8.1 thousand in one year. 51.7% of the cows were dairy cows, 40.7% were beef cows and 7.6% were dual-purpose breed. The increase is mainly due to the increase in the number of beef cattle. The majority of the cattle herd is kept by economic organizations but, in parallel with the expansion of the beef herd, the role of individual farms comes to the fore. In 2018, 58% of the cattle herd was kept by economic organizations and 42% by individual farms.

According to the data of KSH, the pig population amounted to 2.872 million individuals in 2018, which is practically the same as a year earlier. The decline in the number of sows stopped, the year-end survey of KSH counted 177.9 thousand individuals, i.e. 3.7% more than a year earlier. The emergence of African swine fever (ASF) in Hungary had a fundamental effect on foreign trade. The 31% share of the previously dominant Far Eastern countries in Hungarian pork exports in 2017 fell to 9% by 2018. At the same time, this was partially offset by the expansion of pork and live pig exports to European countries. The reorganization of markets moderated the decline in the purchase price of live pigs, which was 10% in 2018.

In December 2018 the poultry population decreased by 2.2% to 39.7 million compared to the previous year's survey (KSH). The number of hens, which make

up 77% of the herd, fell to 30.7 million. The number of laying hens did not change significantly: 11 million individuals were counted in December 2018. The goose population increased by 12% to 1.3 million. The turkey herd fell by 2% to 2.8 million. The number of ducks (4.9 million) increased by 4.2%. The production of all poultry species increased in 2018, of which the increase in slaughter duck production was decisive. Poultry accounted for 54.3% of total slaughter animal production in 2018. Chickens accounted for nearly two-thirds of slaughter poultry production, ducks and turkeys for 17% each, and geese for 5% in 2018.

The number of sheep was 1.1 million and the number of ewes was 798 thousand in 2018. About two-thirds of the sheep population is located in the northern and southern regions of the Great Plain. The majority of the stock, i.e. 86%, was kept by individual farms. Production in the sheep sector expanded in 2018. Slaughter sheep production increased by 3.8% annually. Exports of live animals are dominant in the sector. The volume of live sheep exports increased by 13.6% compared to 2017. Italy remained Hungary's largest market, but its share of our total exports fell from 86% to 74%. In addition, Turkey (14%), Germany (5%) and Croatia (4%) were significant. In addition to live sheep exports, sheep meat exports also increased, mainly to Far Eastern markets. Domestic sheep consumption remains extremely low (0.2 kg/capita).

The fruit and vegetable sector contributed 10.7% to the total agricultural output (2019). According to the data of KSH, the value of fresh vegetable output was HUF 193.8 billion in Hungary in 2018 at current basic prices, which was 7.8% higher than a year earlier. Traditionally, sweet corn, green peas, and watermelons are the vegetables grown in the largest area which together occupied more than half of the vegetable area in 2018. Based on the production value, tomatoes, green peppers, sweet corn, green peas and watermelons were the most significant vegetables in 2018, together they accounted for 59.8% of the production value. Hungary has been a leading producer and exporter of sweet corn in the EU for years. Yields are stable year by year thanks to production based on a high degree of mechanization and modern technologies. The production of sweet corn for industrial purposes is subject to a buyer contract almost everywhere. The market of corn on the cob for fresh consumption is fully covered by domestic, mainly smaller farms.

In Hungary, the growth of areas under controlled organic cultivation was 4.9% in 2018. Organic farming thus accounts for 4% of domestic agricultural land. This is

higher than the previous value of 2.5-3%, but still lags behind the 2017 EU average (7%). The number of organic enterprises also increased (4%), to which processors and importers also contributed, in addition to farmers representing the vast majority. In Hungary, more than half of the controlled ecological areas are meadows and pastures. This is followed by arable land with a one-third share, while the role of orchards and other perennial crops is significantly smaller. On almost half (46%) of the arable land cereals are produced and the share of industrial crops is also significant (15.4%).

## **Presentation of the Hungarian forestry sector**

According to the latest forestry sector report for 2018, 2,054 thousand hectares of forestry areas are registered in Hungary, of which 1,939 thousand hectares are areas covered with trees. 56% of forestry land is state-owned, 1% is community-owned, and 43% is privately owned. The ownership and management structure of private forests is extremely fragmented, and the majority of private forest owners and forest managers are not professionals, which reduces the efficiency and competitiveness of forest management. 40% of the forests are protected nature conservation areas or Natura 2000 forests, and the remaining forests are also home to many plant or animal species in need of protection. A significant proportion of forests also have other protective or public welfare purposes. In view of these, forest management in Hungary is subject to significant restrictions in the public interest. The coherence between the economic, protective and public welfare functions of the forest is ensured by district forest planning covering all forests that is repeated every ten years, as well as mandatory professional management and advisory services that can be used on a voluntary basis. Nearly half of the wooded area is covered by forests consisting mainly of native tree species. In these forests, especially in the case of those involved in nature conservation, nature-friendly forestry is carried out without clearcutting, if the conditions are met. Typically, conventional rotation forest management is practiced in planted forests and tree plantations meant for economic purposes. Logging is carried out on 7-10% of the wooded area in a year, about one-quarter of which is final harvesting and the rest is logging for silvicultural purposes. Only about 70% of the amount of wood (increment) produced in the Hungarian forests annually is logged, so the living tree stock is growing year by year.

The professionalism and sustainability of forestry is guaranteed by the network of forestry specialists. The Hungarian forestry regulations require the forest manager to employ specialists, the so-called forestry professionals, for the professional management of forestry. Larger forest managers typically provide this by employment, while smaller ones within the framework of an engagement contract. According to the register of the forestry authority, as of 27 September 2018, there are 3,477 full-time forestry professionals and 1,002 career entrants qualified as trainees in Hungary. Of the total staff, 3,173 forestry specialists have secondary and 1,306 have higher education (data source: Forestry Directorate of the National Food Chain Safety Office). Forestry professionals are obliged to monitor the condition of forests and the process of forest management, to lead the professional administration of forest management, and to countersign forest managers' reports and data submissions to the forestry authority. From 1 July 2020, only qualified enterprises, the so-called forestry management enterprises, may provide forestry management services. As of 1 November 2020, the forestry authority has so far registered 657 such enterprises (data source: Forestry Directorate of the National Land Centre, 2019, and NÉBIH Forestry Directorate, data provision to NAK on request, 2019).

Forestry management activities therefore mean the performance of mandatory tasks. The forestry advisory service operates separately from this, which is used by forest managers as an option according to their needs. Both activities are carried out by forestry specialists, with partial overlap.

The number of people employed in agriculture, forestry and fisheries was 210.7 thousand in 2019, of which the share of people working in forestry is approx. 10%. The number of employees in the forestry sector has shown an increasing trend in recent years (it increased by 6.9% between 2013 and 2018, and has been stagnating since 2015.) At the same time, in international comparison, employment of more than 10 people per hectare is outstanding, and within the European Union this indicator is the highest in Hungary. The labour-intensive nature of the forestry sector is also reflected by the fact that a permanently higher rate of 0.6-0.5% is achieved in employment compared to the 0.2% rate in gross value added (KSH, 2020).

Overall, it can be stated that the professionalism of sustainable, efficient forest management is ensured partly by those performing forest management activities



and partly by forestry advisors. Both activities are carried out by forestry specialists, with partial overlap.

## 2. Characteristics of AKIS

### 2.1. AKIS description

The central coordination of the Hungarian AKIS (Agricultural Knowledge Transfer and Innovation System (in Hungarian: ATIR)) is currently being developed, however, the identification and brainstorming of the actors of the system is already realized through the Agricultural Advisory System. As far as the future is concerned, coherence in cooperation will expectably strengthen given that there is a need and intention for it both from the governmental, professional and social sides.

The actors of AKIS: farmers/foresters/food producers, advisors, researchers, agricultural producer organizations as well as governmental and non-governmental organizations, in-school and out-of-school educational institutions, networks, media, other services, etc., i.e. all those who produce or transfer knowledge.

At the governmental level, the Ministry of Agriculture (AM), the Ministry of Innovation and Technology (ITM) and the Ministry of Human Resources (EMMI) as well as the background institutions supporting the work of the ministries are the main AKIS actors. Horizontally, the operational tasks of research and innovation are performed by the National Office for Research, Development and Innovation (NKFIH); the sustainable development and international networking of the research infrastructure is supported by the National Research Infrastructure Committee (NKIB).

The following higher educational institutions play a relevant role in the efficient operation of AKIS: University of Veterinary Medicine, University of Debrecen, University of Nyíregyháza, University of Sopron, University of Szeged, Szent István University, and Széchenyi University. These institutions are maintained by the state or foundations.

Agricultural vocational schools covering the whole country and maintained by the Ministry of Agriculture, as well as institutions participating in adult education are also of paramount importance.

Other actors of the AKIS system are farmer and producer professional and inter-professional organizations and associations that unite the individual Hungarian

agricultural and food supply chains (e.g. milk, poultry, pig, cereals, fruit and vegetables, sheep, herb, etc. sectors).

AKIS operates directly and/or indirectly from public, private and EU funding. In this respect, actors include financial institutions (financial and financing organizations, e.g. banks, credit institutions). It is also necessary to mention the EU-supported networks (Innovation Networks: EIP-AGRI OCS/FCS, LEADER, ENRD), the media, and other information channels (social sites, trade fairs, etc.), and the operation of non-governmental organizations (foundations, councils, associations).

One of the most important elements of knowledge dissemination is the media and other multimedia channels, be it online media, social networks or paper-based publications, but also national and international events and fairs, where AKIS actors can meet and talk to each other in person.

The role of NGOs primarily strengthens the relationship between consumers and producers through personal presence.

Horizontally, the interests of those active in all areas of the agri-food economy are represented by the Hungarian Chamber of Agriculture (NAK), from production through processing to trade, given that membership of the chamber is mandatory in Hungary. NAK also plays an important role in knowledge transfer by, inter alia, organizing the training and examination of advisors, carrying out coordination tasks related to advisory activities, and establishing, keeping and publishing a list of advisors and advisory organizations, keeping contact with agricultural and rural development advisory organizations of the EU Member States (Magyar Közlöny, 2019). In addition to NAK, two professional chambers also play a significant role in the field of knowledge transfer: one is the Hungarian Chamber of Professionals and Doctors of Plant Protection (MNMNK) and the other one is the Hungarian Veterinary Chamber (MÁOK).

MSzR operates within the framework set by law, with the coordination of the National Advisory Centre operating within the Hungarian Chamber of Agriculture. FAS basically means regulation and coordination related to advisory activities, but the National Agricultural Advisory Committee (NATaB) is part of the system. The Commission has the power to propose and give an opinion on the coordination of certain tasks related to agricultural and rural development advisory service.

The members of NATaB are appointed by the Minister of Agriculture on the proposal of NAK. The aim of the chamber's proposal was that all actors involved in the advisory system are represented in the committee, from the decision-making level, through agricultural higher education, research, professional and advocacy level to those involved in practice. Based on the composition of the membership, it can be said that NATaB practically covers the actors of AKIS.



Figure 3 Composition of the National Agricultural Advisory Committee. Source: NAK (2020)

### 2.1.1. AKIS actors and knowledge flows

The driver of innovation is research and development, in which both state and market participants are involved in Hungary. We would like to describe the actors of the Hungarian AKIS on the basis of the composition of NATaB, supplemented by the most important target group of AKIS, i.e. producers and food producers. The following section details the actors of AKIS (functions, tasks, impact on the system, etc.).

#### **Agricultural producers (farmers/foresters, food producers)**

According to the data of KSH, the number of people employed in agriculture, forestry and fishing was 210,700 in 2019, while the number of those employed in the food industry was 145,100 in the same year. According to the 2016 census of KSH, the age composition of those working in agriculture was as follows: the proportion of those over 65 was 31%, while the proportion of those under 35 was 6%. (In parallel with the decrease in the number of farms, the number of people

aged 55-64 decreased by 20% altogether.) In terms of the number of farms, 416,000 individual farms and 9,000 organizations operated in 2016.

### **Government sector and its background institutions, authorities**

The Ministry of Agriculture (AM) is responsible for agriculture, the food industry, fisheries, forestry, environmental and natural resources, and rural development. The main goal of the Ministry is knowledge-based sustainable and competitive agricultural management, stable food production, as well as the adoption and support of measures necessary for a liveable countryside.

The Ministry of Innovation and Technology (ITM) is responsible for industry, trade, innovation, research, climate change, and waste management, while the Ministry of Human Resources (EMMI) is responsible for higher education and vocational training (excluding agricultural vocational training).

The work of the ministries is supported by background institutions such as NAIK-Agricultural Research Institute (NAIK-AKI), etc. In addition, there are authorities that publish information booklets and organize information campaigns, and in this respect they are part of AKIS. For example, the National Food Chain Safety Office (NÉBIH, which belongs to the AM) also prepares information booklets and organizes campaigns for consumers, encouraging the public to make conscious and safe food choices.

### **In-school and out-of-school education: Secondary education (vocational schools), higher education (universities, colleges), adult education**

Secondary education, the basis of secondary vocational training at the national level in agriculture and food processing is provided by agricultural vocational schools maintained by the Ministry of Agriculture. There is a need for further development in the quality of education. Institutions are underfunded and due to the low attractiveness of the sector, it is very difficult to find the right quality, highly qualified teachers for teaching (the number of students, teachers, and professional experts is low), which has also been recognized by the decision makers. As of 1 July 2020, the 47 agricultural vocational training schools that had operated until then were integrated into 5 agricultural vocational training centres: Central Hungarian Agricultural Vocational Training Centre, Alföld Agricultural Vocational Training Centre, Southern Agricultural Vocational Training Centre, Northern Agricultural Vocational Training Centre, and Kisalföld Agricultural Vocational Training Centre. In order to develop vocational training, they want to place significantly more emphasis on cooperation with the economic actors in the region, on the efficiency of farming, and on improving utilization.

In international comparison, Hungarian higher education is well represented in agriculture. Universities play an important role in AKIS, as they also function as knowledge transfer centres: they carry out research, education and advisory activities as well, thus playing a role in encouraging the young generation in the field of innovation. With the help of universities, there are demonstration farms (model farms) where students can get acquainted with new technologies and the latest research results. A good example of this is the model farm network of Széchenyi University (SZE), which consists of more than 60 model farms/model plants. The model farm network covers the entire agricultural production system and is an important tool for putting university research results into practice.

Several universities have recognized the importance of agricultural advisory service, so they also launch courses that place a strong emphasis on developing “soft skills”. These types of skills play a key role in effective knowledge transfer and, therefore, they also play a fundamental role in advisory work. These universities generally seek to participate in cooperation and projects at EU level, thus emphasizing the importance of higher education training. (Both Széchenyi University (SZE) and Szent István University (SZIE) are recognized in this field.)

In the Hungarian agricultural higher education, the number of graduate students is declining, and the students who graduate do not necessarily start working within their field of specialization. There is a growing need for a well-organized higher education structure that meets local needs. This need has been recognized by the education system, so in 2020, the higher education sector has undergone a significant transformation, which puts the operation on a new funding basis. The goal to be achieved by this is more efficient and more modern education in the spirit of quality knowledge transfer. The founder’s and maintainer’s right of the model-changing institutions has been/will be transferred from direct state ownership to asset management foundations, thus renewing agricultural higher education. On August 1, 2020, Károly Róbert campus of Eszterházy Károly University in Gyöngyös and the Georgikon Faculty of the University of Pannonia merged into Szent István University, and the University of Kaposvár and Szent István University continue to operate in one organization. Not only universities but also agricultural research institutes have been involved in the integration, so that teachers and researchers have the opportunity to solve problems that arise in practice together. In the new group of institutions, the academic year 2020/2021 will continue with about 15,000 students, taking into account market needs and foreign trends.

In adult education, EMMI launched a new training system on 1 September 2020, which aims to respond to changes in the economy by launching training courses meeting new needs in the future, thus bringing about a complete structural change in the sector. The aim is to measure the quality of training, reduce administrative burdens and increase the number of people involved in training. One of the tools of the system is the introduction of the new Adult Education Reporting System (FAR).

### **Research centres, research institutes**

Basic research related to agriculture is carried out by the Agricultural Research Centre (ATK) of the state-owned Hungarian Academy of Sciences (MTA), according to the information available on the MTA-ATK website. Due to its special situation, ATK has a strong basic research activity, and with its varieties and patents that can be used directly in practice, it provides biological bases for a significant part of the arable land of the Hungarian agriculture, thus having a decisive influence on the crop production sector. Measured at European level, it is a significant base for agricultural sciences and a major contributor to the transfer of professional and scientific knowledge. ATK coordinates the work of the Institute for Veterinary Medical Research, the Agricultural Institute, the Plant Protection Institute and the Institute for Soil Sciences and Agricultural Chemistry.

The Centre for Ecological Research (ÖK), whose main task is to provide high-quality research on biodiversity and ecosystems, including aquatic and terrestrial life, also belongs to the Hungarian Academy of Sciences. The institution is primarily home to ecological research, but a number of studies are related to the impact of agriculture and forestry on biodiversity.

The Szeged Biological Research Centre (SZBK) is a key institution in internationally recognized Hungarian research in life sciences. The research topics cover many areas of molecular and cell biology, ranging from the industrial utilization of bacteria through the controlled breeding of cultivated plants to the issue of human health and environment protection. SZBK is mainly the workshop for basic scientific research, but the researchers working there also play an initiating role in setting up and managing biotechnology companies, as well as in performing educational tasks.

All three above-mentioned organizations operate under the direction of Eötvös Loránd Research Network (ELKH).

The Hungarian National Scientific Bibliography (MTMT), which carries out its task with the help of the Library and Information Centre of the Hungarian Academy of

Sciences according to the information on their website, is a well-functioning channel of knowledge transfer which, as a bibliographic database, is a repository of the scientific results of Hungarian researchers (even with full text content access).

Applied research is mainly concentrated in the nationwide National Agricultural Research and Innovation Centre (NAIK) (Research Institute of Agricultural Economics; Agro-Environmental Research Institute; Research Institute for Animal Breeding, Nutrition and Meat Science; Food Science Research Institute; Forest Research Institute; Research Institute for Fruit Growing and Ornamentals; Research Institute for Fisheries and Aquaculture; Agricultural Biotechnology Research Institute; Institute of Agricultural Engineering, Research Institute of Irrigation and Water Management; Research Institute for Viticulture and Oenology; Vegetable Crop Research Department; Department of Field Crops Research), and in other institutes belonging to the Ministry of Agriculture. The institutes carry out research, but are also involved in the transfer of knowledge to farmers, in the form of seminars, advisory services or visits to pilot stations. In addition to technological research, the Agricultural Research Institute (AKI), the leading state-funded research institute of the Hungarian agriculture, is also part of NAIK. One-third of AKI is engaged in research while the remaining part deals with data management and information analysis. Through these activities AKI assists the Hungarian government's work on practical research and provides scientific support to agricultural policy makers; at the same time, it also makes the results available to agricultural actors.

The National Research, Development and Innovation Office (NKFIH) is intended to ensure the coordination of domestic research and development and innovation at the governmental level and a stable institutional system for its predictable financing. The task of the Office is to establish a stable institutional system of governmental coordination and predictable financing of domestic research, development and innovation (RDI), ensuring the efficient, transparent and value-creating use of available resources. NKFIH deals with the renewal of the Hungarian RDI strategy for the future, and also manages the central research financing fund as the background institution of ITM. The objective of the NKFI is to strengthen the national innovation system, to encourage dynamic cooperation between research centres, companies and enterprises, and to create an attractive innovation environment. NKFIH prepares Hungary's scientific research, development and innovation strategy, manages the resources of the National

Research, Development and Innovation Fund, and represents the Government of Hungary and the Hungarian RDI community in international and European RDI organizations.

Among the research institutes, it is important to mention the Research Institute of Organic Agriculture (ÖMKi), the only research institute in Hungary specializing in organic farming, with a strong non-profit background. Their research focuses on topics that provide significant and novel results for the practice of organic food production. It is of outstanding importance for Hungarian organic farmers that ÖMKi also provides advisory and research services.

Bay Zoltán Nonprofit Ltd. for Applied Research – with its partly agricultural profile – conducts research in the fields of agro-biotechnology, biomass-based economy and circular economy, among others, according to the website presentation. This organization founded the Hungarian Bioeconomy Cluster, which helps the Hungarian biomass-based economic sector.

Knowledge transfer and innovation are also supported by the Agricultural Information Technology Cluster, which aims to effectively represent the actors of the IT, agricultural and food industry sectors to decision-makers through its functioning network of contacts, as well as to facilitate communication between the parties. The National Office for the Circular Economy (KGNH) is part of ITM, but is mainly funded by private money (working for companies) and EU/national grants (submitting project proposals).

Overall, researchers and educators can also provide advisory services within public research institutes and universities, but there is in fact no public organization in the agricultural sector whose sole purpose is to provide advisory services.

### **Advisory services, advisors and advisory organizations**

Advisory services play an outstanding role in the transfer of knowledge and the practical application and dissemination of innovations, which is brought together by the National Coordination Centre of Advisory Centres (OSzK). OSzK plays a coordinating, recording and controlling role within the framework of the Hungarian Farm Advisory System (FAS), which is advisory service eligible for EAFRD funding, among its tasks and actors. Its tasks are regulated by Decree 16/2019. (IV.29.) of the Ministry of Agriculture and Section 15/B of Act CXXVI of 2012 on the Hungarian Chamber of Agriculture, Food and Rural Development. Its operational tasks are performed within NAK's own organizational framework by the Advisory Group of the Vocational Training and Advisory Directorate. Among other things, the register of advisors and all the information concerning the training and

examinations of advisors is available here and can be read on NAK's website. Until 2019, basically only the registration of advisors related to supported advisory services was the responsibility of OSzK, however, according to the above-mentioned legislation, registration is also mandatory for natural persons and organizations engaged in advisory activities in a field related to the sector. In this sense, not only independent advisors are parts of the system but also those performing advisory services for commercial interests.

According to the register, 1,100 advisors provide advisory services in Hungary, and they play a very important role in achieving Common Agricultural Policy (CAP) supports and in complying strictly with environmental and administrative requirements. There is a great need for this type of service, as farmers are not always familiar with performing administrative tasks, and due to the administrative burden, they would drop out of work, and there are areas in the country where farmers' IT skills also need to be improved. At the same time, advisors play a key role in the execution, writing and submission of rural development applications and project management from an administrative point of view. There is also a growing demand for technological advice (new technologies, precision farming tools, organic farming solutions, integrated pest management, improvement of irrigation). Advisors and advisory organizations operate in Hungary as a network farmers can really rely on. It is necessary to note here that medium-sized enterprises and larger farms have their own advisory organizations (their own employees).

Special technological advisory service is performed by some, usually foreign individuals or companies. These are used by medium- or large-scale special farms, ones that really need individual expertise (e.g. a French advisor for cheese-making, an Italian for winemaking, or a Dutch for strawberry production).

Companies producing agricultural raw materials (producers of input materials): they provide expert advice according to their individual interests, and so they are not impartial, but their presence and influence is significant in the Hungarian agricultural sector. They play a leading role in technology support and knowledge transfer. They are mainly engaged in the distribution of herbicides, fertilizers, seeds and agricultural machinery.

### **Professional and inter-professional organizations**

There are many farmers' organizations in Hungary that focus on a given sector (e.g. arable farming, forestry, horticulture, sheep farming, etc.), but there are

organizations that represent the interests of all farmers and thus act as umbrella organizations for other sectoral organizations. Such is the Hungarian Chamber of Agriculture (NAK), an agricultural advocacy organization founded in 2013 for farmers. It currently employs about 1,200 people nationwide, including 610 village agronomists, who, among other things, provide information and help chamber members regarding issues related to their activities. NAK covers and represents actors throughout the agri-food sector (membership is mandatory for farmers, food processors, traders and service providers – i.e. 400,000 members in total). It provides additional information and acts as knowledge transfer for members (by organizing events, seminars, trainings, study trips abroad), in person and through information publications. The national network of 610 village agronomists has more than 20 years of experience throughout the country. Village agronomists are the local points of information supply and knowledge transfer. The extension of the service to cross-border areas and to Hungarian minorities is also available. NAK is a member of, inter alia, the Committee of Professional Agricultural Organisations-General Confederation of Agricultural Cooperatives (COPA-COGECA), the World Farmers' Organization (WFO), the European Forum for Agricultural and Rural Advisory Services (EUFRAS) and the South Eastern Europe Advisory Service Network (SEASN), as well as the Strategic Working Group on Agricultural Knowledge and Innovation System of the Standing Committee on Agricultural Research (SCAR AKIS SWG). The National Advisory Centre operates within NAK but in an independent status. Tasks of OSZK: registration and training of advisors (1,100 people), as well as liaison with other relevant AKIS actors (e.g. National Rural Development Network). NAK is responsible for agri-food vocational training, it registers and coordinates students and farms participating in dual training, coordinates the organization of study competitions, takes part in the organization of master's courses and examinations, and in the promotion of the agri-food professions.

The Association of Young Farmers (AGRYA) is active in increasing the knowledge flow and knowledge transfer to young farmers. Through their programs, they help to shape consumers' attitudes and promote young people's farming spirit. Given that they have limited financial resources, they have recently been increasingly collaborating with NAK and working together on generational renewal.

**Cooperatives, producer organizations, producer groups, regulatory councils, integrators**

There are a number of professional and inter-professional organizations in Hungary that focus on the needs of a particular sector and represent the given group to policy makers with advocacy, inform consumers about current events through promotion and provide information, knowledge and other services to farmers in the sector. A good example of this is the Hungarian Fruits and Vegetables Inter-professional Organization and Product Council (Fruitveb). The organization regularly organizes professional days – even in foreign languages – focusing on a specific topic, and also conducts surveys, examines market opportunities, gives advice, provides supportive training, and connects farmers. Active organizations provide independent professional advice, primarily in their respective fields. The Southern Plain Gardeners' Cooperative (DélKerTÉSZ) works in a similar way, cooperating with universities in order to solve the common problems of its members through research activities, as well as helping students to organize internships. Another good example is the initiative of Gyümölcsért Kft., which helps the cooperation of political decision-makers, researchers and producers, or MEGÉR-TÉSZ Cooperative, which organizes trainings for their members in the spirit of knowledge transfer. There are many breeding organizations that facilitate the flow of information between breeders, raw material suppliers and those interested in breeding. The Hungarian Association of Pig Breeders and Pig Farmers (MSTSZ) brings together the pig breeding organizations registered in Hungary as an umbrella organization. The association facilitates the flow of information and provides information for producers, among other things, about the relevant regulatory provisions and the conditions of CAP support, and they are in daily contact with all breeders, so they regularly conduct surveys on their needs. The Association of Sheep and Goat Breeders also maintains direct contact with breeders: in addition to increasing the flow of information, awards are given to the most important farms year after year. The Hungarian Charolais Breeders' Association also serves as a good example: it regularly informs its members on both regulatory and technological issues. The Association of Sheep and Goat Breeders also maintains direct contact with breeders: in addition to increasing the flow of information, they give awards to the most important farms each year. The Hungarian Charolais Breeders' Association also serves as a good example: it regularly informs its members on both regulatory and technological issues.

There are integrators that specifically help the flow of knowledge with the goal of increasing market demand. Each of them is concentrated in a given sector, such as Master Good Kft. in the poultry sector, which integrates poultry farmers, organizes and manages the primary market, production processes and sales. It maintains a close professional relationship with its suppliers and pays special attention to their training. There are 168 recognized Producer Groups and 5 recognized Producer Organizations in Hungary, but unfortunately not all of these organizations are active. Many cooperatives operate partly as commercial member organizations and do not provide real, relevant advisory services.

### **EU actors, hubs**

In addition to the above, the Ministry of Agriculture operates the EIP-AGRI Network (European Innovation Partnership “for Agricultural Productivity and Sustainability”) at national level. The aim of the network is to make the agricultural and forestry sector more productive and sustainable. Through this, it helps AKIS actors to adapt to new challenges (market price fluctuations, climate change, stricter environmental rules, more fierce competition). The EIP-AGRI network (Service Point) is operated in cooperation with NAK, NAIK-AKI and the Hungarian NRN. Among the infrastructures and repositories for the dissemination of knowledge and innovation, the EIP platform (<https://eip.fm.gov.hu>) is worth mentioning, which allows current and future Hungarian Operational Groups (OGs) to register and share their innovative ideas, and to publish their subsequent results. The site also provides useful information and news on the European EIP network for the interested parties. At the time of writing, 58 winning applications are being recorded by AM.

The government is working to establish a simplified system of procedures for innovative initiatives in the agri-food sector, and plays a key role in international cooperation and promotion of capacity building for researchers not only in Hungary but also in the wider Central and Eastern European macro-region. Such as e.g. the BIOEAST initiative, which coordinates and represents the food and bioeconomy RDI interests of the Visegrad countries in the fields of sustainability and biomass-based economy, knowledge-based agriculture, aquaculture, and forestry. From the point of view of the future of the national AKIS, the strategic planning of the CAP by AM-AKI-NAK and its future operation is extremely important, for which the three organizations have concluded a cooperation agreement representing the government, science, and the interests of farmers.

The secretarial tasks of the Hungarian National Rural Network (NRN) were transferred from Széchenyi Program Office to Herman Ottó Institute Nonprofit Ltd. from 1 April 2020, so the secretariat operates in synergy with the European Union Rural Development Network (ENRD). The Hungarian territorial network provides information on rural development measures and also conducts surveys. NRN belongs to AM from 2020 and aims to enhance rural development initiatives from domestic financial sources, in line with the priorities set out in the National Rural Development Program. The Hungarian National Rural Network (MNVH) belonging to Herman Ottó Institute Nonprofit Ltd. (HOI) aims to organize the AKIS actors involved in rural development into a network so that it makes the retaining power, the socio-economic development and catching-up of the countryside as well as the efficient use of support resources widely available.

The Hungarian LEADER program is based on the cooperation of local administration, entrepreneurs and non-governmental organizations. Its aim is that small communities take actual, local decisions into their own hands. It creates geographically connected groups of settlements with a population of 10 to 100 thousand to implement the regional development strategies developed by the stakeholders. It regards actors living and working side by side as equal partners, thus shaping their habitat and, through this, their own future together.

The institutions presented above are committed to innovation and effective knowledge transfer and are therefore involved in a number of international projects (i2Connect, NEFERTITI, FAIRShare, EUREKA, EURAKNOS, EFFECT, LIFE, etc.).

#### **Agri-food sector, input producers and distributors, technological advisory services**

The presence and influence of input producers and distributors providing technological advisory services is extremely important and unquestionable in AKIS. They play a leading role in providing technical and technological advice for farmers. They are mainly engaged in the distribution of fertilizers, seeds and agricultural machinery. Given that they provide “free” technological advice (note: the service fee is included in the price of the raw materials, so it is not really free), this type of advice may meet the needs of farmers who do not use independent advisory services. These input material production and distribution companies have developed knowledge transfer methods based on new technologies (technological advisory services) that provide farmers with the latest weather and pest forecasting, nutrient management data, and other information that are sent

to the customers via emails, text messages, newsletters, and on-line advertising applications (pop-ups). They play a key role in promoting and disseminating new products and technologies. Uniquely, one of the largest Hungarian input service providers (integrators) launched a complex advisory service in Hungary a few years ago, using the so-called holistic approach depending on the size of the farm, for a fee (not automatic, i.e. it is not included in the price of the products, but can be used for a fee).

In summary, it can be said that for the other actors of AKIS, the companies producing and distributing input materials can be good partners in advisory services, for example by using the networks of regional representatives, and their existing customer network can be useful for searching for and recognizing “good practices” because through them the interested farms can be involved in AKIS.

#### **Agricultural and food processors**

The activity of food processors is moderate in terms of knowledge flow and knowledge transfer. However, a good example of such an interaction is the specific expectation of a given processing company towards the supplier (knowledge transfer against new technical, technological expectations). However, this is more typical for actors with a large, even international parent company background who, in many cases, have their own, fully equipped research base or, failing that, their financial circumstances allow them to purchase research. At the same time, medium-sized and especially smaller players in the food chain have limited own research and financial opportunities. There are a number of opportunities to encourage knowledge sharing within the food industry, including networking (e.g. knowledge centre), cooperation with universities and research workshops and sharing of best practices. However, widely applicable best practices for knowledge sharing in the food processing sector have not yet been found.

#### **Financial organizations, banks**

Financial institutions and financial actors have an important role to play in ensuring sources of funding for the agricultural sector. In addition, financial institutions work in a specialized form with the relevant actors to develop schemes that can help sectoral investment and the spread of innovation. As an AKIS player, they strive for effective knowledge transfer and high quality services for the customers.

#### **Non-governmental organizations: foundations, associations, councils**

In Hungary, non-governmental organizations also take part in the transfer of knowledge, but they are only present in certain areas because they were

established for a special purpose. For example, Zsörk Foundation, which supports agroforestry, or the Hungarian Soybean and Protein Bean Association, which supports soybean production, or the National Association of Interest Representations for Small-scale Producers and Service Providers (KISLÉPTÉK), which supports smaller food producers, and the Cooperating Balaton Uplands Association, which deals with the development of a distinct rural area.

### **Online media, news portals**

The media and news portals are a key influential force in shaping the attitude of and providing information for the practical side. Agroinform.hu, for example, is a very popular agricultural portal where farmers/producers can access the latest technological information almost immediately. It is important to mention the largest trade fairs and conferences in the country: the Precision Farming Conference and Exhibition (PREGA), the National Agricultural and Food Exhibition and Fair (OMÉK), as well as the AGROmashEXPO and Agricultural Machinery Exhibition organized by Hungexpo. Another noteworthy information provider is the web news portal Portfolio, which is a platform for the economic and financial sectors to meet: it regularly organizes high-quality conferences where research institutes, business organizations, policy makers and actors of the banking sector have the opportunity to express their views on the given topic. The Agro Napló is also a well-known news portal with its own magazine and it also organizes events for the actors of the agriculture sector.

### **AKIS Diagram**

The central actors of the Hungarian AKIS are farmers, foresters and food producers. Their work is supported by the institutional system around them, such as the government sector, research and development, education, the advisory system (National Advisory Centre), various farmers' organizations, professional chambers, furthermore, financial institutions, through EU networks, as well as media and information channels, and NGOs. Horizontally, the Hungarian Chamber of Agriculture plays a key role in the transfer of information and knowledge and the flow of knowledge between different organizations, in order to help the work of farmers.

As far as the relationships between AKIS actors are concerned, they can be incidental or regular, direct or indirect. By organizing various forums (thematic

working groups (e.g. NAK KAP AKIS sub-working group), consultations, events, conferences, briefings, etc.), NAK helps the establishment of relations, knowledge transfer and information flow between the various actors. A system of relations independent of NAK is also established and operating between the individual actors.

The current structure of the Hungarian AKIS is shown in Figure 4.

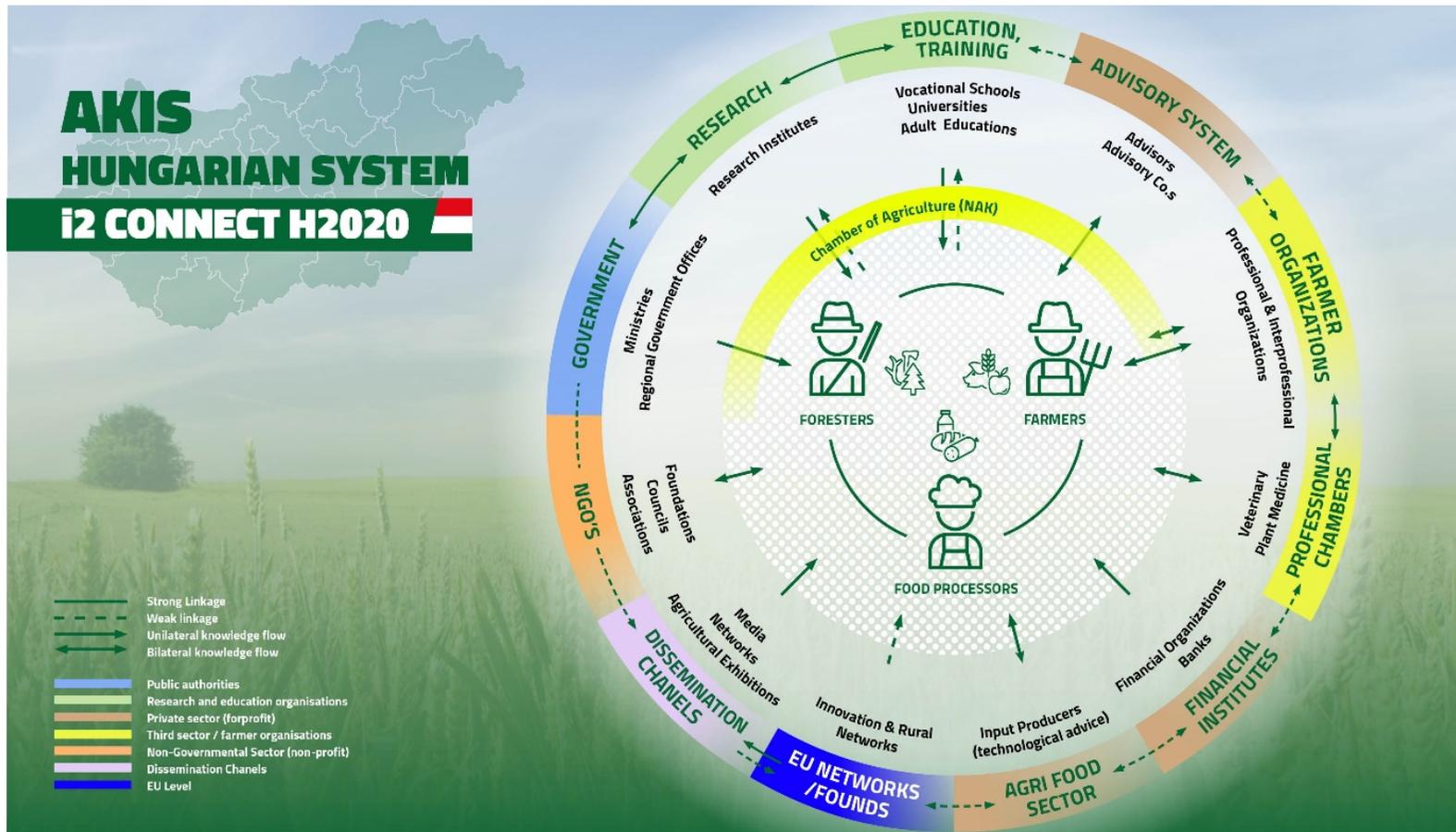


Figure 4 The Hungarian AKIS Source: own editing

### 3. History of the advisory system

The publication of J. Kozári entitled *Szaktanácsadás* (2007) explains in detail the formation and development of the Hungarian advisory system to this day. “The germs of advisory service developed in Hungary in the Middle Ages. We can be proud that our country was among the first not only in Europe, but also worldwide to organize agricultural vocational education and related advisory service.” He then goes on to say that the first authentic, written document on advisory service in Hungary dates back to 1892. In the early 1900s, the institutionalized framework of advisory services began to emerge primarily in the agricultural vocational education network, but at that time it had not yet become a national organization. In 1936, the name “Vocational School and Agricultural Advisory Station” was included in the titles and responsibilities of all primary and secondary agricultural vocational education institutions. Advisory activity based on large holdings was started in 1965. Attachment to the area and topic as well as central designation were abolished, and it was possible to gain admission to the Advisors’ Central Register by voluntary registration; the National Agricultural Advisory Committee (OMSzB) was established in 1968 from the leaders and representatives of the organizations included in the Register. By the end of the 1980s, the limited framework of the advisory network had become national in scope and affected all large agricultural holdings. At that time, there were 7,100 consultants from about 225 advisory institutions, mainly for large companies. The change of direction that had already taken place in Western European countries earlier unfolded in Hungary by the end of the 20<sup>th</sup> century. In these countries, farmers remained the primary target group for advisory services, but other groups in the agricultural population also played an increasingly important role. Government-supported rural development programs have allowed the emergence of agricultural advisors. However, according to Cser (2001), there was no proper information contact system and network between these advisory organizations, a lot of partial data and incomplete information were collected, which they could not manage and use properly. In the production systems that have become industrialized, it was especially important to apply new knowledge and introduce new technologies, so useful advisory service also played a significant role. The partner farms and farmers could be connected to the production systems through contracts. According to Kozári (1993), the advisory activity of production systems also contributed greatly to the high standard of the Hungarian agriculture. Nevertheless, this type of advisory service differs from the advisory service

according to our current concepts. Integrated producers were usually provided with advisory service by experts from state farms and producer cooperatives, and less often by “advisors” of production systems.

Hungary joined the European Union in 2004. In Hungary, the transformation of the system of agricultural advisory services began in the autumn of 2005, taking into account the measures announced by the Hungarian Government and the provisions of the EU regulations that entered into force in the autumn of 2003. The aim of the transformation was to have a high-quality service system based on several pillars, which is easy and cheap to use and meets the needs of farmers and takes their possibilities into account. This is in line with the requirements set out in EU Regulations (EC) No 1782/2003, (EC) No 1698/2005 and (EC) No 1974/2006 for the Farm Advisory System (MSZR), which is mandatory for all Member States from 1 January 2007. The task of MSZR is to replace and supplement the knowledge and intellectual capacities necessary for the improvement of the quality of production within the framework of the service provided to farmers and foresters.

Actors of the Hungarian MSZR: National Advisory Centre (OSzK), Regional Advisory Centre (RSzK), Territorial Advisory Centre (TSzK), Vocational Advisory Centre (SZSzK), and the National Advisory Committee, later the National Agricultural Advisory Committee (NATaB).

Until 30 September 2014, the National Agricultural Advisory, Educational and Rural Development Institute (NAKVI) performed the tasks of OSZK, however, from 1 October 2014, OSZK operates within the organizational framework of the Hungarian Chamber of Agriculture (hereinafter: NAK). In accordance with Decree 73/2015 (XI. 6.) of the Ministry of Finance on agricultural and rural development advisory activities, the holder of a license issued by NAK on the basis of this Decree is entitled to carry out supported advisory activities. The authorization procedure can be initiated through the Advisors’ Electronic Directory Management System (ESzNR) managed by NAK. Basic and compulsory training for the advisors, as well as the related examinations are organized and conducted by NAK. Based on the knowledge base of agricultural higher education institutions, the Regional Advisory Centres (7, with regional geographical coverage) assisted the advisory work of the territorial advisory centres, as well as provided basic and mandatory further training for advisors to increase the efficiency of the advisory services and to develop new ones. The Territorial Advisory Centres performed the supported

advisory tasks, i.e. advisory services implemented in actual practice. In the period 2007-2013, there were 82 accredited TSzKs, of which 23 performed advisory services in 2016 actively. Vocational Advisory Centres (SzSzK) are organizations set up in agricultural research sites, development and service, as well as university further training sites that helped TSzKs and advisors in solving special problems within their respective fields. The National Agricultural Advisory Committee (NATaB), as the professional advisory body of the Managing Authority participates in the coordination of certain tasks related to agricultural advisory service with the power of proposing and giving opinions. The aim of the renewal of the committee in 2019 was that all actors involved in the advisory system are represented in the committee, from the decision-making level through agricultural higher education, research, professional and advocacy level to those involved in practice.

Overall, it can be said that agricultural advisory activity has a tradition in Hungary and the quality and methodology of knowledge transfer has developed dynamically in recent years as well. The advisory system has undergone significant changes in recent decades. With the establishment of the Hungarian Chamber of Agriculture the representation of farmers' interests and advisory service has risen to a new level.

## **4. The agricultural and forestry advisory service(s)**

Advisory organizations are market-based companies or private entrepreneurs who typically operate in a specific geographical area, but often with national coverage. An advisory organization may only be entitled to a field of specialization for which its participating advisors have obtained an advisor's entitlement.

### **4.1. Overview of all service suppliers**

At present, there are 48 advisory organizations registered in Hungary, 24 of them are independent of input material distributors, of which 17 organizations are entitled to carry out supported advisory activities. Eight organizations do not provide commercial services, but they do not provide supported advisory services either.

A supported advisory organization may be an organization selected through a tender that has its registered office in the territory of the European Union and at least a site in Hungary and provides advisory services in the fields listed in the relevant legislation to persons who may be eligible for support financed at least partly from the public finance subsystem, from EU funds or from another program under an international agreement.

### **4.2. Advisory policy, financial systems**

The task of the Hungarian MSZR is to replace and supplement the knowledge and intellectual capacities necessary for the improvement of the quality of production within the framework of the service provided to farmers and foresters on the basis of the civil law contract concluded with them. The task of the MSZR actors is to provide effective advice to the beneficiaries on land management and farm management.

Supported advisory service plays a key role in enabling domestic producers and food processors, as well as foresters, to make good use of support resources, to

know and comply with their obligations and to carry out competitive, sustainable agricultural, food processing and forestry activities.

In the Partnership Agreement the Government has set the objective of encouraging participation in lifelong learning for the programming period 2014-2020. It intends to achieve this goal in cooperation with the advisory organizations, in accordance with the conditions set out in the call for proposals for supported advisory service. In the Rural Development Program of Hungary, the aim of the measure is to provide the actors of agriculture, forestry and food economy with professional assistance meeting their needs which primarily promotes efficient knowledge transfer and innovation, as well as increasing the economic competitiveness of the target groups involved in the Rural Development Program, also taking into account the requirements of sustainability, environmental and climate protection, as well as resource efficiency. In the case of foresters, advisory activity is primarily focused on the conservation of natural habitats, the protection of wildlife and plants, and the implementation of the Water Framework Directive, while in the case of food processors, on the production of healthy and safe food. The measure contributes to all the overall objectives of the CAP.

Under the measure, the advisory service is provided in two different forms, in the framework of individual and group advisory service in the following target areas:

**1. individual advisory service:**

Target area A: farmers;

Target area B: young farmers;

Target area C: foresters;

Target area D: food processing enterprises in rural areas qualified as micro and small businesses;

**2. group advisory service:**

Target area A: farmers;

Target area B: young farmers;

Target area C: foresters;

Target area D: food processing enterprises in rural areas qualified as micro and small businesses;

Target area E: producers of REL cooperation.

Innovation goals: With the help of advisors with a high level and up-to-date professional knowledge and experience, the innovation knowledge of farmers can be significantly increased, and they can receive advice on the practical application of innovations.

Climate policy goals: The main task of the advisors is to draw the attention of the participants to production methods that contribute to climate policy goals, i.e. the reduction of greenhouse gas emissions and energy consumption, and to provide practical advice on their application. The advisory service should also cover climate change mitigation and effective adaptation, farming aimed at protecting biodiversity and the waters, and increasing environmental performance. The importance of supported expert advice in Hungary is most relevant for small and medium-sized farms. Due to their low income levels, these farms can rarely or not at all afford to hire their own advisors, but at the same time, due to the time required for their activities, it is difficult and often late for them to obtain adequate information on their own. Thus, they are not always aware of their obligations and opportunities and therefore, their observance or the use of opportunities is not always appropriate. Therefore, as defined in the EAFRD Regulation, at the level of farms, supported advisory services must cover at least one of the following in Hungary as well:

1. Management requirements, standards for good agricultural and environmental condition, requirements at farm level;
2. Agricultural practices beneficial for the climate and the environment, maintenance of the agricultural area;
3. Measures at farm level provided for in the RDP;
4. Requirements of the Water Framework Directive;
5. Principles of integrated pest management;
6. Occupational safety standards or safety standards linked to the farm;
7. Starting agricultural management (optional farming forms, accounting, business economics, young farmer sub-program);
8. Forestry topic;
9. Economic and environmental performance of the enterprise.

Supported advisory activities in the period 2014-2020 are carried out by the advisory organizations that submitted a grant application and were selected for the service in VP1-2.1.1-2.1.2-17 Call for individual and group advisory service on agriculture, forestry and food processing.

Requirements for organizations selected for supported advisory service:

1. availability of a customer ID;
2. their advisors attended and completed the mandatory further trainings;
3. have a working relationship with registered advisors;
4. through their advisors they are able to provide advisory service on at least three of the topics set out in Article 15 of Regulation (EU) No 1305/2013.

Only an organization that qualifies as a transparent organization under the legal conditions can apply for support.

### 4.3. Human resources and methods of service provision

In Hungary, advisory services may be provided by legal entities and private individuals included in the register according to the related legislation. The most important methods of knowledge transfer used in the advisory work are as follows:

- individual: farm visit, office consultation;
- group: lectures; organization of presentations;
- use of online tools: website, blog, professional subpage on social platform;
- methods used in written form and
- methods through mass communication.

Table 1 Most important methods of knowledge transfer. Source: NAK (2020)

In case of problem solving, the goal is to provide suggestions and solutions tailored to the individual	In case of problem prevention, the goal is to avoid problems
Farm visit	Holding of lectures
Office consultation	Organization of presentations
Online and telephone contact	Mass information (social media, television, radio)
Preparation of written materials (e-mail, letter, reminder)	Written materials (articles, brochures, textbooks)

## 4.4. Clients and topics/contents

When defining the primary target groups, we have data regarding the supported organizations. The supported advisory organizations were selected on the basis of a call for proposals issued by the Managing Authority (MA). Currently, 17 organizations can provide support from EU funds, however, they were designated between June and July 2019, so we still have little information about the related activities and concrete results. The number of farmers to be reached per special field as specified in the RDP is shown in Table 2.

*Table 2 Number of farmers required for the supported advisory organizations, broken down by focus area. Source: VP1-2.1.1-2.1.2-17 call for proposals (2017)*

Focus area	Planned number of those receiving advisory services (persons)
Primary agricultural production	40,250
Food processing	5,250
Forestry	4,500
Environmental management	18,000
Farmer in SSC cooperation	2,000
Young farmer	4,200

## 4.5. Programming and planning of advisory work

The advisory program includes a schedule that helps the advisor decide when and which advice should be published and which methods should be used at a given moment. For example, plant protection programs should be started before pathogens are expected to appear. The advisor should be prepared for these tasks. The methods proposed for application should support each other, and their timing can help a lot in this.

The task of the advisor is to create a program that is able to raise awareness in the farmer of the lack of his knowledge and to make the solution attractive through the benefits of implementing the program. (Kozári & Tóth (2019).

The advisory plan of the supported advisory organization must contain the following information for accounting for the grant (VP1-2.1.1-2.1.2-17 Call for proposals for individual and group advisory service related to agriculture, forestry and food processing):

- Planned number of customers
- Classification of the planned number of customers per indirect beneficiary
  - farmer;
  - food processor;
  - forester;
  - young farmer;
  - producer of REL cooperation.
- Fields of specialization of the participating advisors
- Number of advisors involved in supported advisory service
- Mandatory topics covered by the participating advisors (topics under Paragraphs 4), 5) and 6) of Article 15 of Regulation (EU) No 1305/2013)
- Planned number of supported individual advisory hours
  - Net hourly rate for individual advisory service
  - VAT payable on support qualified as consideration, provided for the individual advisory service
  - To be understood per contract concluded
    - sum of hours
    - expected service hourly rate
- Gross hourly rate of individual advisory service
- Planned number of supported group advisory hours
  - Net hourly rate for group advisory service
  - VAT payable on support qualified as consideration, provided for the group advisory service
  - Gross hourly rate for group advisory service
  - sum of hours
  - expected service hourly rate.

## 4.6. Advisory organisations forming the FAS and evaluation of their FAS implementation

Data on the operation of advisory organizations in Hungary are available from 29 May 2019 on the basis of the annual reports submitted by the organizations. The advisory organizations registered in accordance with the law had to prepare and submit the report to OSZK on the online platform created for this purpose by 28 February 2020. The evaluation of the organizations is made from data of the reports.

In 2019, there were 5 organizations with less than 10 customers, 50 organizations with 10 to 39 customers, 4 organizations with 40 to 99 customers, and 11 organizations with more than 100 customers. Customer numbers are detailed in Figure 5.

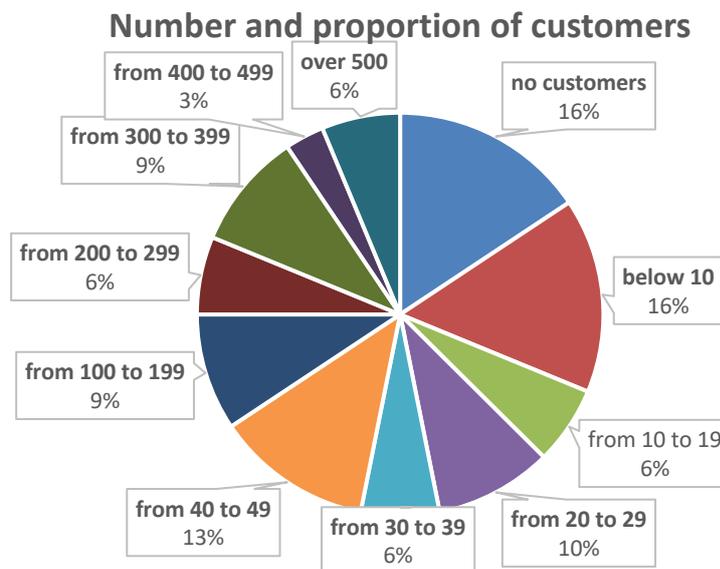


Figure 5 Distribution of advisory organisations by number of customers. Source: NAK (2019)

## 5. Summary and conclusions

The main purpose of this report is a comprehensive examination of the Hungarian AKIS, with special regard to agricultural advisory services. The study contains the general characteristics of the Hungarian agricultural and forestry sector and AKIS, as well as the historical development of the advisory system. The organizations providing advisory services, policy issues, methods of knowledge transfer, as well as the advisory organizations that make up the FAS and their operation are presented in detail.

The authors define AKIS as a system that connects people and institutions to promote mutual learning and to produce, share and use technologies, knowledge and information related to agriculture. The system integrates farmers, advisors, educators in agricultural education, researchers and other actors who generate, share and use knowledge and information from different sources to operate and develop the agricultural sector.

### 5.1. Summary and conclusions on sections 1 – 3

The most important natural treasure of Hungary is arable land. 70% of its area is suitable for agricultural use, and within this proportion, 72% is arable land. The number of employees in Hungary increased continuously between 2011 and 2018, and in 2019, it exceeded 4.5 million. Agriculture is an extremely important sector of the national economy in terms of food supply for the population, which has been further strengthened by the restrictive measures caused by the COVID 19 pandemic. The number of people employed in agriculture, forestry and fishing was 210.7 thousand in 2019, representing a decrease of 2.0% compared to the previous year. Due to the varied local conditions, field crop production is very diverse, but the role of cereals and oilseeds is decisive. Hungary has good conditions for feed production and animal husbandry, therefore, animal husbandry traditionally plays an important role in the Hungarian agriculture. Organic farming accounts for 4% of domestic agricultural land. In Hungary, 2,055 thousand hectares of forest land are registered, 56% of which is state-owned.

The Hungarian AKIS has a rather heterogeneous structure. In addition to the various ministries, actors in the advisory system, participants in education and research, professional chambers, advocacy organizations, farmers' organizations, media and information channels, NGOs and various EU networks play a decisive

role. The Hungarian Chamber of Agriculture plays a key role in AKIS, especially in the field of protection of farmers' interests, as well as in the generation and dissemination of information. Advisory services, which are brought together by the National Advisory Centre, have a prominent role in the transfer of knowledge and the practical application and dissemination of innovations. OSzK plays a coordinating, recording and controlling role within the framework of the Hungarian Farm Advisory System (advisory services supportable from EAFRD funds), among its tasks and actors. According to the register, 1,100 advisors provide advisory services in Hungary, and they play a very important role in achieving CAP (Common Agricultural Policy) support and in strict compliance with environmental and administrative requirements. There are many farmers' organizations in Hungary that focus on a specific sector, but there are also organizations that represent the interests of all farmers and thus, they operate as an umbrella organization of other sectoral organizations. Such is the Hungarian Chamber of Agriculture (NAK), an agricultural advocacy organization founded in 2013 for the farmers which currently employs approximately 1,200 people nationwide, including 610 village agronomists who, among other things, provide information and help chamber members regarding issues related to their activities.

Agricultural advisory activity has a long tradition in Hungary and the quality and methodology of knowledge transfer have developed dynamically in recent years as well. The advisory system has undergone significant changes in recent decades.

## **5.2. Summary and conclusions on section 4**

At present, there are 48 advisory organizations registered in Hungary, 24 of them are independent of input material distributors, of which 16 organizations are entitled to carry out supported advisory activities. Eight organizations do not provide commercial services, but they do not provide supported advisory services either. Advisory organizations are market-based companies or private entrepreneurs who typically operate in a specific geographical area, but often with national coverage. An advisory organization may only be entitled to a field of specialization for which its participating advisors have obtained an advisor's entitlement.

In Hungary, advisory services may be provided by legal entities and private individuals included in the register according to the related legislation. In their work advisors primarily use individual and group knowledge transfer methods, however, the pandemic has also highlighted the importance of using online tools.

According to the authors, the further development of the Hungarian AKIS is possible with the help of the following:

- Increasing the flow of knowledge between research and practical life. This encourages researchers to meet practical experts, organize thematic events on farms where they present their results, so farmers and researchers meet and exchange experiences.
- Assessing the needs of farmers continuously and as widely as possible and sharing the results with advisors who act as intermediaries in various innovative initiatives; they transfer knowledge and hold thematic trainings/presentations to transfer and update knowledge.
- Encouraging interactive innovation initiatives. Facilitating the networking of actors, sharing domestic and cross-border calls/opportunities, facilitating the exchange of knowledge, setting up innovation supporting services, developing projects and finding innovative ideas.
- Supporting intergenerational renewal through expert collaborations.
- Supporting digital development in agriculture. Development and practice-oriented use of databases in the sector for the development of digital skills.
- The relevant potential of the educational network should be used even more effectively in the future. The research results accumulated in agricultural higher education institutions/research centres need to be transferred to farming practice even faster by means of innovative knowledge transfer methods.

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# AKIS and advisory services in *Ireland*

## Report for the AKIS inventory (Task 1.2) of the i2connect project

*Date: December, 2020*

**Author:**

Paul Maher, Assistant Director Knowledge Transfer, Teagasc

**Contact:**

[paul.maher@teagasc.ie](mailto:paul.maher@teagasc.ie)

Project funded under the Horizon 2020 Research and Innovation Programme under Grant Agreement number 863039.



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION' HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 863039

## Executive summary

This report provides an updated description of the Agricultural Knowledge and Information System (AKIS) in the Republic of Ireland, with a strong focus on provision of relevant knowledge and networks around innovations in agriculture by a range of providers of agricultural advisory services. This report builds on the details previously summarised in the *PRO AKIS* project which reviewed and reported on the Irish AKIS. It also reflects on recent working documents prepared on the AKIS as part of the Department of Agriculture's CAP consultative process. Since the 2014 report, the general understanding of the AKIS and its prominence in policy documents has advanced and it is now envisaged that the AKIS of the future will be funded and supported in a more planned approach than it has been up to now.

The Republic of Ireland is unique in that a substantial component of the Irish AKIS lies within a single organisation (Teagasc, the Agriculture and Food Development Authority). Teagasc undertakes activities in research, extension services and education. Teagasc is a national organisation with programmes delivered through seven research centres, seven agricultural colleges and 52 local advisory offices dispersed around the country. It provides an independent source of scientific based information for all Irish farmers (> 130,000) and professionals (circa 10,000 Full Time Equivalent, FTE) who provide services to the AKIS. It also co-ordinates over 100 demonstration farms across a range of production systems and delivers accredited training to over 5,000 learners each year as well as having an annual advisory contract with circa 45,000 individual farmers.

Universities and other third level institutes are also involved in the delivery of research and education services to Irish farmers and professionals (sometimes in partnership with Teagasc). In addition to the cohort of Teagasc advisors (>300 FTE) there are a similar number of "private advisors" who provide services directly to farmers across the country. There are also a large cohort of advisors (circa 200 FTE) who work for industry (farm input suppliers and other farm service providers) and media that provide support to farmers. Overall it is estimated that over 75% of farmers have a formal relationship with an advisor. The farmers who work with advisors every year tend to anchor their relationship with them around the annual application for CAP funding and they also tend to draw down larger than average

annual payments. Within the Irish system, advisors may specialise in supporting farmers accessing CAP funding, farm development work or a hybrid of both. In addition to agricultural advisors every Irish farmer will work closely with a veterinarian professional (>4,000) who in addition to solving animal health issues can also assist with preventative animal health planning.

Over the last thirty years the development role of the agricultural advisor has evolved from a “teaching” role to a facilitator of “knowledge exchange” role. This has been enabled by the increased standard of education among farmers, the increased participation in peer to peer learning environments such as discussion groups and the explosion in availability of farm performance data.

Outside of advisors, farmers can access data and information from a multitude of professional digital sources as well as from each other using a range of social media channels and networks. Policy organisations and agencies also use these channels to influence the information that is accessed by Irish farmers. This has also changed the role of the advisor from an information provider to an information navigator.

In Ireland, publicly funded, mixed funded and private funded services coexist. This provides farmers with a choice of provider. It also recognises that Government should not be the sole provider of finance to fund all of the services offered by a public advisory service, but it does need to support the provision of public goods which otherwise would not be provided due to market weakness or failure.

Through Teagasc, Ireland has retained a strong national advisory service based on a mixed funding model that recovers approximately 40% of the cost from farmers and joint industry partners. The joint industry programmes are a noteworthy activity that focus on common areas of interest to all parties and increase the overall funding and advisory effort dedicated to meeting specific common objectives. These programmes also provide the opportunity for individual AKIS actors to collectively assess the research information available and communicate to providers on this.

In a small country like Ireland all AKIS actors are aware of each other but do not always work closely together unless they have close personal contact or are part of a suitable network or project. In many situations they provide competing



services to farmer clients. Working on areas of common interest, common problems or funded projects have been shown to be practical ways to stimulate improved collaboration.

A good example of this in Ireland are the EIP-AGRI projects funded by the DAFM under the Rural Development Programme (RDP) 2014 – 2020 which bring together actors such as farmers, researchers, advisors and agri-businesses to identify innovative solutions to particular challenges facing the agri-food sector, bio-economy and rural economy.

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## 1. Main structural characteristics of the agricultural and forestry sector

### *Overview*

Irish agri-food accounted for 7.5% of modified GNI (€14.8 billion), 10% of total merchandise exports and 7.7% of employment in 2018 ([DAFM, 2020](#)). Irish food products are exported to over 180 countries worldwide and are generally perceived as high quality safe products with strong “green” credentials as highlighted in recent years through the Bord Bia Origin Green programme which is underpinned by food quality and assurance schemes at producer and processor level. Global and EU market policy-issues impact strongly on the Irish food sector, given that Ireland is primarily a food exporting country (with approximately 80% of production exported). In 2018 Irish agri-food exports were worth €13.7 bn. Ireland also imports agri-food products, and in 2018 these imports were valued at €9.7 bn ([DAFM, 2020](#)). Animal feeds as well as consumer branded food products and specialised ingredients for further processing in the Irish agri-food industry were predominant in Irish agri-food imports.

Agri-food production and processing is particularly important in rural areas of Ireland where other economic opportunities are more limited. Outside of the main urban centers it accounts for a much larger share of income and employment. Despite its strengths and importance to the national and regional economies the industry is currently facing a number of significant economic, environmental, production and social challenges which will influence its future development.

### *Farm level challenges*

At farm level, economic challenges include the current modest levels of farm scale and profitability for the majority of farming enterprises which has led to an increase in part-time farming and a concentration of capital investment on larger, mainly dairy farms ([Buckley and Donnellan, 2020](#)). This dynamic may constrain the wider adoption of capital intensive new technologies and on all other farm systems.

The environmental challenges facing the agri-food industry include meeting national commitments around reducing the volume of agricultural gaseous

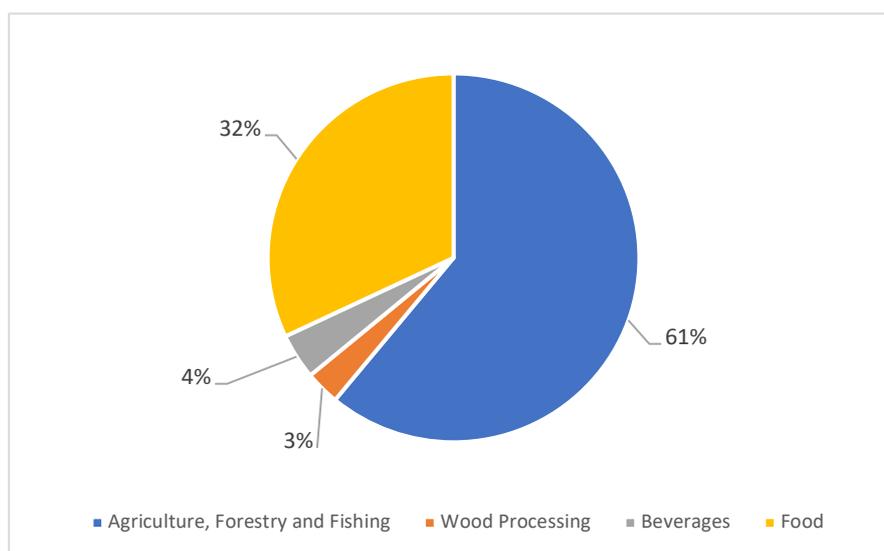
emissions (Greenhouse Gases and Ammonia), improving water quality and enhancing biodiversity. There is also an urgent need to reduce the risk of Antimicrobial Resistance (*AMR*) and support Integrated Pest Management (*IPM*) and reduced use of pesticides.

At farm level there are also a number of social and sectoral capacity challenges that are influenced in a significant way by an ageing farm workforce. These challenges include the need for measures to improve uptake of innovation, improved farmer health, safety of farms, and quality of life on farms and in rural Ireland. Action will be required to enable improved female participation within farm businesses and supports for more active and earlier farm succession planning and management.

Overall, the agri-food sector will need to improve the sourcing, management and retention of a high quality, well-educated labour force; increase its use of cost-effective automation and the exploitation of large data sets and digital technologies to support management decisions in relation to both improved farm income and social and environmental performance.

### ***Regional opportunities***

At regional level, agriculture and food will continue to anchor wider rural development. The development of the bio-economy may bring new opportunities that will vary across different geographic regions. In the short term this may include an increased focus on pasture valorisation, renewable energy production and development of woodlands as well as niche food production and associated tourism and leisure activities. The facilitation of rural and farm based entrepreneurship will be increasingly important to the achievement of balanced regional development. Publicly funded investment will be needed to ensure that physical and digital connectivity available to those living and working in rural Ireland is at least as attractive as that available in Ireland's towns and cities.



**FIGURE 1 COMPOSITION OF EMPLOYMENT IN THE AGRI-FOOD SECTOR, 2017**  
DAFM Fact Sheet on Irish Agriculture, December 2019.

### Overview Statistics

The following table sets out a number of key statistics that show an agricultural system that is predominantly pastoral based and the mix of farming systems tends to be stable. There has been some expansion in dairy production since the milk quota regime ended. Food output is approximately 1/3 dairy, 1/3 beef with the other third mainly made up of pigs, sheep and crops.

**TABLE 1 OVERVIEW OF KEY IRISH AGRI-FOOD INDICATORS**

	2010	2016	2019
Number of farms	139,860	137,500	n.a.
Utilised agricultural area (UAA) excl. commonage and forestry (ha)	4,568,938	4,455,800	4,524,400
Commonage (ha)	422,215	427,800	n.a.
Forestry (ha) - estimated	725,888	764,394	774,045
Grassland as % of UAA	92%	92%	92%
Tillage as % of UAA	6%	6%	6%
Other as % of UAA	2%	2%	2%
Average farm size (ha)	32.7	32.4	n.a.
Animal numbers by sector – dairy (cows only)	1.071 m	1.398 m	1.505 m
Animal numbers by sector – beef (incl. dairy repl.)	5.536 m	5.841 m	5.704 m
Animal numbers by sector – sheep (total)	4.745 m	5.140 m	5.146 m

Animal numbers by sector – pigs (total)	1.516 m	1.604 m	1.616 m
Animal numbers by sector – poultry (total)	10.925 m	11.053 m	n.a.
Horticulture Output value (Euro m)	275	343	349

Source: [CSO Census of Agriculture 2010](#), [Farm Structures Survey 2016](#) and [CSO June 2019 Crops and Livestock Survey](#). Forestry area based on data from the 3<sup>rd</sup> National Forestry Inventory and annual afforestation data from the [DAFM Forest Statistics 2020](#).

## 2. Characteristics of AKIS

### 2.1. AKIS description

In Ireland the AKIS embraces both national and international dimensions, and it includes public and private research entities, education providers, agricultural consultants and veterinarians, producer groups and organisations, food processing companies and co-operatives, input supply (e.g. feed, fertiliser, plant protection products, breeding) and service companies (e.g. finance, machinery, accounting, ICT, labour), universities and institutes of technology, government departments (including most notably the Department of Agriculture, Food and the Marine (DAFM) and other Departments with a role in managing for example, the environment, energy and natural resources and health and safety), public agencies such as Bord Bia and the Environmental Protection Agency and also entities such as the Irish Cattle Breeding Federation, Animal Health Ireland, and the agricultural media which is strong in Ireland relative to other countries.

AKIS requirements arise out of a large number of policy areas including broadly the national agri-food strategy but also a large number of agriculture sectoral areas such as dairy, meat, tillage, horticulture, organic farming and forestry, and increasingly areas that require integration with agriculture including climate, nitrates and water quality, fertilisers, feeding stuffs, pesticides, animal health and welfare, biodiversity, digitisation, rural economy, education, research, innovation, skills and training and bioeconomy.

It is estimated that Ireland has circa 10,000<sup>1</sup> professionals (FTE) servicing over 130,000<sup>2</sup> farmers across a range of areas of expertise. Ireland has been judged to have a strong and integrated Agricultural Knowledge Innovation System (AKIS) in comparison to other countries in the EU. This means that there is a relatively good infrastructure of professional support available to the farming sector.

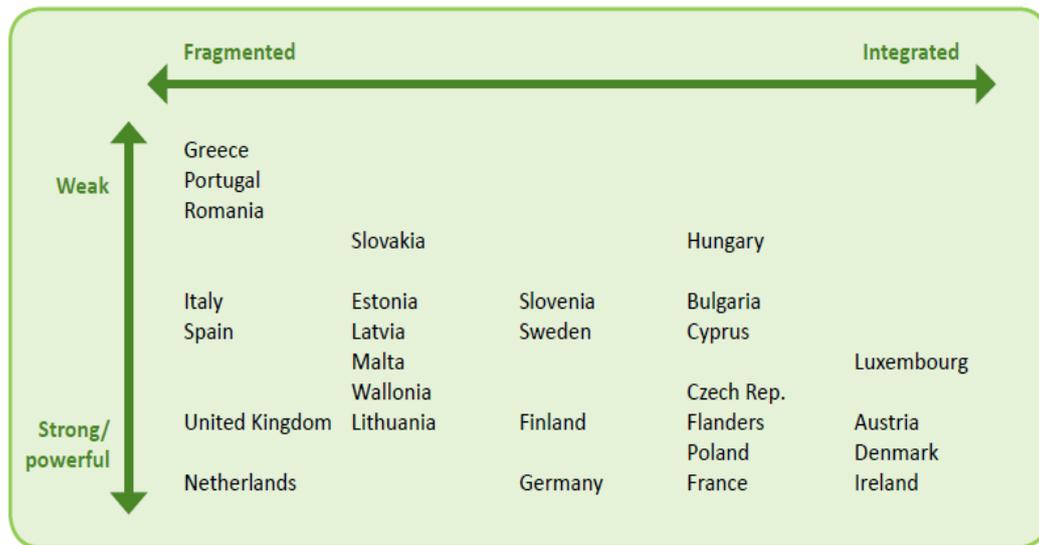
The AKIS will need to expand its scope that AKIS to achieve the diverse outcomes demanded from servicing the immediate needs of stakeholders as well as

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<sup>1</sup> Teagasc internal working paper

<sup>2</sup> <https://www.cso.ie/en/releasesandpublications/ep/p-fss/farmstructuresurvey2016/>

responding to the trajectory set by the policy in the impending Agri-Food Strategy 2030, EU Green Deal and a Climate Neutral Europe by 2050.



**FIGURE 2 OVERVIEW OF SELECTED EU COUNTRY AKIS SYSTEMS**  
ProAKIS Report (2015)

The following sets out some summary points around some of the main entities active in the Irish AKIS:

**(i) Government - Department of Agriculture, Food and Marine**

A number of government departments and agencies have remits under areas including innovation, enterprise, education, skills, energy, finance, environment and climate. The Department for Agriculture, Food and the Marine (DAFM) is one of the primary funders for integrated research on environment, agriculture, rural economy, bioeconomy and food through core funding provided to Teagasc as well as a competitive funded research programmes that it administers. Agricultural research in Ireland is also funded by a range of other agencies and companies, and is also carried out by universities, technology institutes research centres, technology centres, technology & regional clusters. DAFMs competitive research funding programme is guided by a strategic research agenda that influences the expected outcomes and outputs of funded projects. Further coordination is

achieved through the interdepartmental committee on Science, Technology and Innovation and its strategic agenda.

DAFM also administer the delivery of CAP support payments to farmers which has a significant role in guiding farmers in meeting a minimum standard of good farming practice as well as providing the opportunity for farmers to participate in significant schemes supporting changes in farm practice that are supported by advisors (public and private). DAFM have also administered funded programmes to encourage participation in knowledge transfer activity and networking across a range of farm and land use enterprises. In addition, DAFM also has a regulatory and inspectorial role across all farming activity and food production which includes cereal varietal testing and certification, phytosanitary and animal health monitoring.

Over the last 12-14 years DAFM have engaged extensively with stakeholders in the agri food sector to develop and publish national strategies for food and agriculture - Food Harvest 2020, Food Wise 2025 and currently a new strategy aimed at 2030 and the sectors challenges. These strategies were co-created by the relevant stakeholders and the implementation is monitored by a select committee chaired by the Minister for Agriculture Food and Marine. The strategies have been hugely important in giving confidence to the industry and in supporting the need for a planned and well organised AKIS which is accountable at the highest level.

**(ii) Teagasc**

A substantial component of the Irish AKIS lies within a single organisation (Teagasc, the Agriculture and Food Development Authority). Teagasc undertakes activities in research, advisory and education. Teagasc is a national organisation - a government agency with programmes delivered through seven research centres, seven agricultural colleges and 52 local advisory offices dispersed around the country. It provides an independent source of scientific based information for all Irish farmers (130,000) and professionals (circa 10,000 FTE) who provide services to the AKIS. It also co-ordinates over 100<sup>3</sup> demonstration farms across a range of production systems and delivers accredited training to 5,000<sup>3</sup> learners each year as well as having an annual advisory contract with over 45,000<sup>3</sup> farmers.

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<sup>3</sup> Teagasc Annual Reports, <https://www.teagasc.ie/about/our-organisation/annual-reports/>

Teagasc employs around 1,200<sup>3</sup> staff and the greater part of the organisations activity is funded by the state with other income streams coming from farmer clients, student fees, industry partner contributions and a range of project funding sources. Teagasc expenditure<sup>3</sup> is approximately in the areas of research (50%), advisory (30%) and education (20%). Teagasc is responsible for the delivery of the majority of vocational level agricultural education to young farmers in Ireland. The majority of full time education delivered by Teagasc is accredited under the guidance of Quality and Qualifications Ireland (QQI). The Teagasc Education Vision Strategy to 2050 ([Teagasc, 2018](#)) sets out how the agricultural education system will evolve into the future. Teagasc also supports building the innovation capacity in the sector by funding up to 60 PhD and 20 Masters students each year as part of its Walsh Scholarship programme<sup>3</sup>.

Teagasc provides a natural fulcrum for actors and knowledge flows within the Irish AKIS as well as contributing to the AKIS policy framework at national level and providing networking and co-ordination structures. This role is consistent with the organisations mandate and mission. Teagasc has established its “ConnectEd” programme to provide AKIS actors with access to Teagasc research, education, knowledge resources and online tools as well as network opportunities around particular themes. Further information around the structure, funding and programmes delivered by Teagasc can be found at [www.teagasc.ie](http://www.teagasc.ie).

**(iii) Farmer Representative Organisations**

In Ireland farmers are well represented by a number of organisations that help individual farmers at a local level and also represent the broader interests of farmers at policy level. Larger traditional organisations such as Macra Na Feirme (young farmers association), ICMSA (Irish Creamery Milk Suppliers Association) and IFA (Irish Farmers Association) are represented on numerous agricultural organisations and stakeholder consultative groups including the Teagasc Authority. A number of other organisations such as the Irish Hill Farmers Association (IHFA), Irish Cattle and Sheep Farmers Association (ICSA), Irish Organic Farmers and Growers Association (IOFGA) and Irish Grain Growers Group (IGGG) are also active in more recent years, generally in more specialised areas.

**(iv) Irish Food Industry, ICOS, Bord Bia, ICBF and Sheep Ireland**

The Irish food processing sector has modernised and expanded in recent years. It has emerged from a history and long tradition of co-operative principles, mainly

in the dairy and milk processing sector (the first co-operative creamery was opened in 1889) and is now structured and capitalized in models ranging from international PLC to artisan owner-operator producer. The co-operative principles and endeavor are promoted by the Irish Co-operative Organisation Society (ICOS) through its activity and education programmes. ICOS is also represented on the Teagasc Authority.

All Irish food processors have invested and modernised their facilities in recent years and are strongly focused on high food quality standards and supporting their suppliers to improve the sustainability of their farming systems. This is strongly connected to the “joint industry” programmes run in partnership with Teagasc and others as well as the “Origin Green” initiative led by Bord Bia<sup>4</sup>. This initiative promotes Irish food and is grounded in a number of verifiable certified food quality assurance schemes across the main food producing processors and farming enterprises producing food products in dairy, beef, sheep, pigs, cereals and horticulture enterprises.

The Irish Cattle breeding Federation (ICBF<sup>5</sup>) was formally set up in 1998, as a non-profit organisation charged with providing cattle breeding information services to the Irish dairy and beef industries. Sheep Ireland is closely aligned with ICBF and fulfils as similar function for the sheep industry. Information and data on individual animals, herds and national populations of breeds is generated and shared by ICBF and Sheep Ireland with all AKIS advisors and vets and is key to delivering on initiatives that underpin future sustainable cattle and sheep production systems.

**(v) Private and Industry Advisors**

Irish farmers have a choice to engage with an advisor from the public, private or industry sectors. It is estimated that there are a similar cohort of private advisors active in the Irish AKIS as there are in Teagasc (circa 300 FTE). In addition there are approximately a further 200 advisors available to farmers through suppliers and other service industries that supply services to Irish farmers. The Agricultural Consultants Association (ACA<sup>6</sup>) represent the interests of a cohort of the private advisors. However the industry advisors and a number of private advisors do not

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<sup>4</sup> See [www.bordbia.ie](http://www.bordbia.ie) for further details

<sup>5</sup> See [www.icbf.ie](http://www.icbf.ie) for further details

<sup>6</sup> See <https://aca.ie/> for further information

have any structured representation. Private advisors cover a vast range of areas of expertise and service across the country.

**(vi) Vets and Animal Health Ireland**

In Ireland there are over 4,000 veterinary professionals<sup>7</sup> who provide public, private and industry services. The majority of public good services are through funded programmes by DAFM while private services are generally delivered directly to farmers for fees or in a supporting role for veterinary products purchased by farmers. There are some emerging areas of “knowledge exchange” activity that vets deliver in partnership with advisors and other professionals around calf care, management of SCC, herd health planning and animal housing etc. Animal Health Ireland (AHI<sup>8</sup>) functions as a partnership between private sector organisations and businesses in the agri-food sector and the Department of Agriculture, Food and the Marine. It is a not-for-profit organisation, government funding is provided but linked to private sector contributions.

AHI provides benefits to livestock producers and processors by providing the knowledge, education and coordination required to establish effective control programmes for non-regulated diseases of livestock. The advice provided by AHI is developed by a number of Technical Working Groups.

**(vii) Agri-Media and Agri-Networking Agencies**

Irish farmers and agri professionals are fortunate to have access to a range of sources of media across a range of media platforms including print, radio, television, podcast, video and other digital and social media. There are a range of organisations (public and private) that provide daily, weekly, monthly and occasional information to broad and targeted national and regional audiences. In addition to agri-media, there are a range of organisations such as the National Rural Network (NRN), Agri Aware and the National Dairy Council who promote and communication on a number of priority areas of rural development agriculture and food production and consumption.

**(viii) Other Policy and Regulatory Departments and Organisations**

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<sup>7</sup> See <http://www.vci.ie/> for further information

<sup>8</sup> See <https://animalhealthireland.ie/> for further information

As the sustainability challenges have emerged and grown in recent years a lot of government departments<sup>9</sup>, regulatory agencies and non-governmental agencies have taken a strong interest in Irish agriculture and food production systems. The Department of Environment, Climate & Communications (DECC), Department of Housing Planning and Local Government (DHPLG), Local Authorities, the Environmental Protection Agency (EPA) and the Sustainable Energy Authority of Ireland play significant roles in this regard. In recent years they have contributed to the overall sustainability of Irish food production.

The establishment of official Producer Organisations (PO's) is a relatively new development in Ireland which is expected to strengthen producers positions in the supply chain through greater collaboration and co-operation.

**(ix) General Business Services**

Outside of agri dominated businesses such as suppliers of feeds, fertilisers, chemicals and breeding solutions there are a variety of suppliers of services such as finance, property, insurance, accountancy, contracted labour and services, machinery and ICT that have a significant influence on a range of farm decisions. All of these services are generally provided as fully commercial services. In many cases they also provide add-on farm consultancy/advice and innovation support to famers through their services and products.

**(x) Rural Diversification and Enterprise Agencies**

One of the emerging challenges for Irish farmers who wish to diversify is accessing information and capital. In this regard, local County Enterprise Boards (CEB) provide direct grant-support to new and existing enterprises and promote entrepreneurship, capacity building and women-in-business at local level, to micro enterprises (<10 employees) in the commercial sphere.

In addition there are other broader based rural development type extension services, including LEADER local action groups, local development groups, community/ rural development companies, local enterprise offices and Enterprise Ireland which are linked to agriculture and food depending on the respective region and local issues.

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<sup>9</sup> See <https://www.gov.ie/en/> for further information

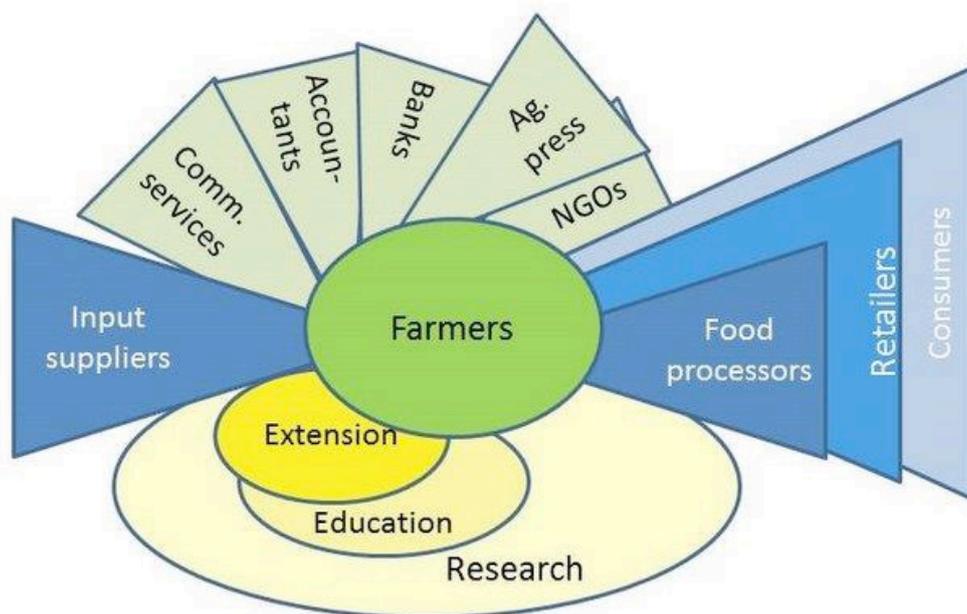
**(xi) General Education Providers**

In Ireland there is a limited but important focus on agriculture and food across all of the primary and secondary schools curriculum. This may be further enhanced as the AKIS stretches itself to influence all of the changes needed by producers and consumers to meet the future sustainability challenges.

In addition, Skillnet Ireland programmes have been developed with many agri-food organisations to advance the competitiveness, productivity and innovation of Irish businesses through enterprise-led workforce development.

**2.2. AKIS diagram**

Like many other countries the presentation of the Irish AKIS can be largely based on the graphic prepared by the SCAR AKIS working group shown in figure 3.



**FIGURE 3 AKIS OVERVIEW GRAPHIC**  
SCAR AKIS working group, 2012

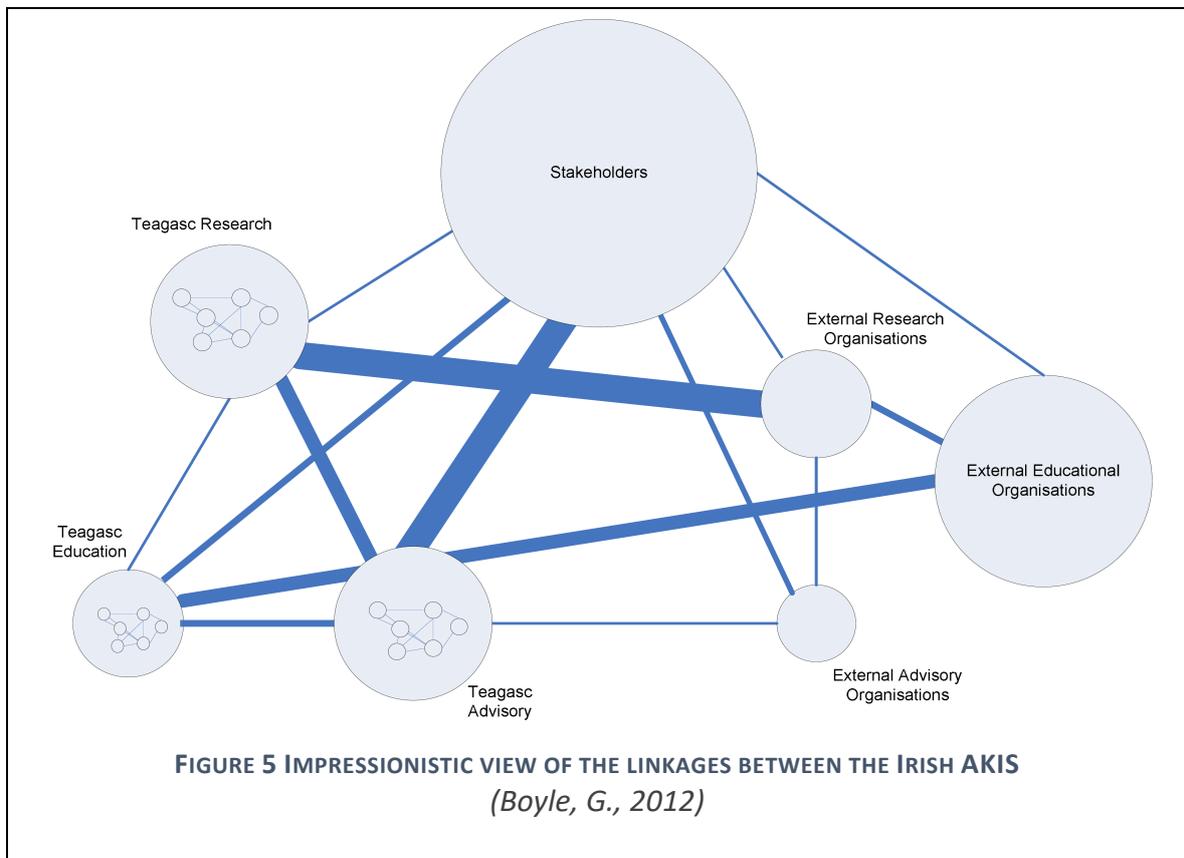
Teagasc have represented this graphic recently as shown in figure 4.

## The IE-AKIS in summary

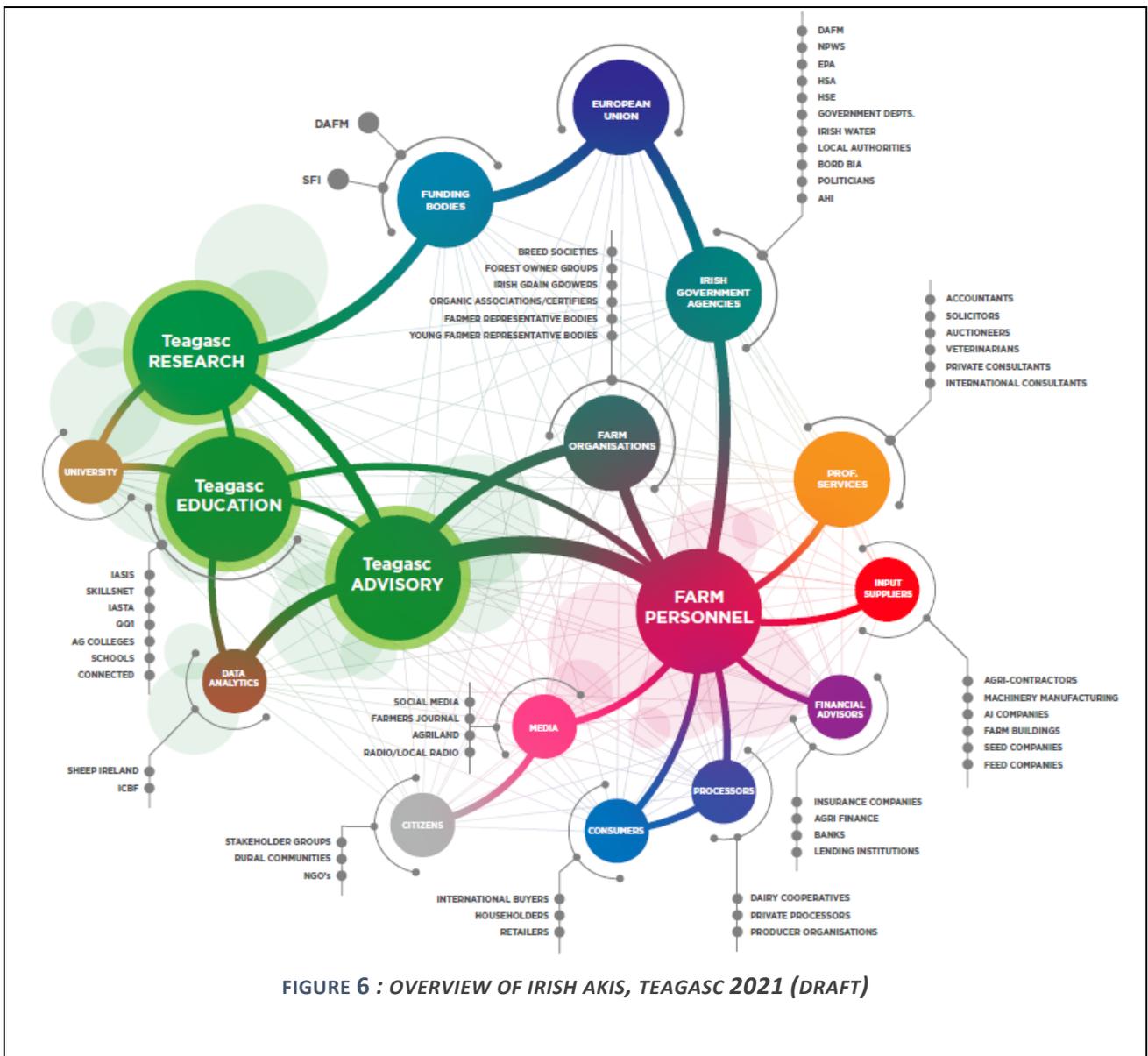


FIGURE 4 SUMMARY OVERVIEW OF IRISH AKIS, TEAGASC 2019

Over the years there have been a number of efforts to represent the Irish AKIS in a schematic diagram that shows the relative strength and sizes of each component of the AKIS. It difficult to show this visually with meaningful detail. The version shown below in figure 5 (Boyle, 2012) attempts to indicate the relative size of each entity and strength of connections between each entity within the AKIS by the relative size of the circles and the thickness of the lines between them. Boyle, commented that there are some strong and some weak connections between many of the key stakeholders. Examples of strong connections are Teagasc advisors-stakeholders and Teagasc research-external research while weak connections exist between external research-stakeholders and Teagasc advisors-external advisors.



A further version is currently being developed and is presented below in figure 6.



### 3. History of the advisory system

Ireland has a long history of provision of advisory services going back as far as supporting farmers in the aftermath of Irish Potato Famine in the 1840's, the provision of public service advice by the Agriculture Ministry from 1900, the establishment of advisory services in each county through the Local Authorities from 1932, and the establishment of a national advisory body in 1981 (ACOT) which became part of Teagasc which has been in operation since 1988.

Until about 1980, the Irish AKIS was mainly operated by agricultural colleges and local training centres throughout the country, mostly financed by county committees of agriculture funded via an agricultural land tax. The Department of Agriculture funded some colleges, and also counties to provide local advisors, and encouraged basic agricultural training in the schools. With this structure, it was difficult to ensure consistent and high-quality advice throughout Ireland.

In 1980, a new semi-state organisation, the national advisory and training body (ACOT), was set up to provide training and advisory services for farmers. It took over the functions and personnel of the five state colleges, and also the state funding of the private colleges. At this point a national standard for training in agriculture was established. It was also responsible for the management of some 600 agricultural advisors.

In 1988, Teagasc was established as the national agency with overall responsibility for the provision of research, training and advisory services to the agriculture industry. It subsumed the training and advisory functions of ACOT, so that benefit could be derived from the co-ordination and integration of the training and advisory service with the research services (AFT). Around the same time a fee for access to advisory services was introduced for the first time.

Due to cutbacks in funding in the late 1980s, the number of Teagasc advisors fell from over 600 in 1980 to 350 in 1993, and resulted in the discontinuation of some services and the non-replacement of staff who retired. Additional funding throughout the 1990s led to a recovery in advisory staff numbers to around 450, plus 100 contract Rural Environment Protection Scheme (REPS) advisers.

At this time the private advisor numbers started to grow significantly to service schemes such as REPS and annual applications for CAP funding.

A further reduction in Teagasc staffing in 2007 led to a reduction in advisor numbers to 260 with a recent recovery in numbers back towards 300 FTE due mainly to support from government and industry for a number of joint programme initiatives including the Agricultural Sustainability Support and Advisory Programme (ASSAP) which is providing free advisory services to farmers who are in catchments where there is high pressure on water quality from agriculture.

It is estimated that there are a similar cohort of private advisors active in the Irish AKIS as there are in Teagasc (circa 300 FTE). In addition it is estimate that there are approximately a further 200 advisors available to farmers through suppliers and other service industries that supply services to Irish farmers. There are also a significant number of “advisors” who deliver education programmes and other specialist roles that support front line advisors.

The food processing sector also engages with Teagasc and other private entities for advice. Since 1987 and the establishment of Food Industry Support Programme at Teagasc Ashtown, significant advice and training has been provided on areas such as food safety and establishment of food quality systems that have enabled hundreds of companies to meet market specifications.

## 4. The agricultural and forestry advisory service(s)

### 4.1. Overview of all service suppliers

Ireland has retained a strong, partially publically funded advisory service integrated into its research and education functions based on a mixed funding model. In addition, a similar cohort of private advisors and a smaller cohort of “industry” advisors provide services directly to Irish farmers. The total cohort of active advisors ranges from year to year depending on the cycle of CAP scheme funding. Currently it is estimated that there are 800 advisor FTE active across the AKIS.

Currently DAFM hold a register of 800 trained advisors under the Farm Advisory System (FAS<sup>10</sup>) and 700 Pesticide Advisors<sup>11</sup> under the Sustainable Use Directive (SUD). These lists contain public and private advisors who work on a full and part time basis.

This mix of public and private funded services provide Irish farmers with a choice of service provider. This is important for the provision of services and advice to meet farmers immediate needs as well as providing support for longer term adoption of innovation and change.

The sustainability challenges ahead require all advisors to find new ways to maximize their impact on Irish farms. Teagasc has an important role in this regard both in the delivery of services as well as supporting the other professionals that deliver services to farmers through its ConnectEd programme.

**TABLE 2 OVERVIEW LIST OF AKIS SERVICE PROVIDERS**

Status of the organisation	Type of organisation	Organisation
Public sector	Government Departments	Department of Agriculture, Food and the Marine Department of Environment, Climate & Communications Department of Further and Higher Education, Research, Innovation and Science

<sup>10</sup> <https://www.gov.ie/en/service/a3036-find-a-farm-advisory-system-advisor/>

<sup>11</sup> <https://www.pcs.agriculture.gov.ie/sud/pesticideadvisors/>

Status of the organisation	Type of organisation	Organisation
		Department of Rural and Community Development Department of Housing Planning and Local Government
	Government Agencies / and agencies in receipt of significant government funding	Teagasc (Agriculture and Food Development Authority) Bord Bia – Irish Food Board Environment Protection Agency (EPA) Enterprise Ireland (EI) Food Safety Authority of Ireland (FSAI) Food Safety Promotion Board (SafeFood) Higher Education Authority (HEA) Health and Safety Authority (HSA) Irish Research Council Science Foundation Ireland (SFI) Skillnet Ireland Sustainable Energy Authority of Ireland (SEAI) Sustainable Food Systems Ireland Bord Iascaigh Mhara (Irish Sea Fisheries Board) Marine Institute of Ireland Central Statistics Office (CSO)  Animal Health Ireland (AHI) Irish Cattle Breeding Federation (ICBF) Sheep Ireland Horse Sport Ireland Irish Dairy Board (IDB)
	Local/regional agencies	52 Teagasc offices County & City Enterprise Boards (CEB)
<b>Research and Education</b>	University (Higher Education Institutes)	4 Teagasc colleges 3 Private colleges 12 Teagasc Regional Education Centres  Universities (8) Dublin City University, National Universities of Ireland, Cork, Dublin, Galway and Maynooth, Technological University Dublin, Trinity College Dublin, University of Limerick  Institutes of Technology (10) Athlone (AIT), Cork (CIT), Dundalk (DKIT), Galway-Mayo (GMIT), Carlow (IT Carlow), Sligo (IT Sligo), Tralee (IT Tralee), Letterkenny (LYIT), Limerick (LIT), Waterford (WIT)

Status of the organisation	Type of organisation	Organisation
	Research Institutes	7 Teagasc Research Centres Institutes of Technology
	Research Funding Organisations	Enterprise Ireland Science Foundation Ireland Irish Research Council Department of Agriculture, Food and the Marine Environmental Protection Agency Higher Education Authority (HEA) Sustainable Energy Authority of Ireland (SEAI) Marine Institute of Ireland
<b>Private sector</b>	Food chain actors	Food processing companies Milk (crossover with co-ops), Meat (8 larger companies) Cereals / Brewing Horticulture  Input supply companies Feeds, fertilisers, seeds, sprays, medicines Animal and Plant Health Association (APHA): Veterinarians Veterinary Council of Ireland Veterinary Ireland  Service businesses Agricultural Contractors + Representative Organisations Farm Relief Services Accountants Banks, Finance, Insurance, Legal  Media Range of media national and regional, print, radio and digital, some who specialise in agriculture and food.
	Private advisors	300 + private advisors, a number of whom are represented by the Agricultural Consultants Association of Ireland
	Co-operatives	Milk Quality Ireland Irish Co-operative Organisation Society (ICOS) Animal Health and Artificial Insemination co-operatives

Status of the organisation	Type of organisation	Organisation
		Over 20 dairy co-ops, 9 fishing and food co-ops Over 40 marts
<b>Farmer based organisations &amp; NGOs</b>	Farmers' circles/groups	100 SignPost monitor demonstration farms (supported by Industry and Teagasc) 800 Discussion groups
	Land manager representative bodies	Irish Creamery Milk Suppliers Association (ICMSA) Irish Farmers Association (IFA) Irish Grain Growers Group (IGGG) Irish Cattle and Sheep Farmers Association (ICSA) Irish Hill Farmers Association (IHFA) Irish Organic Farmers and Growers Association (IOFGA) Other Organic Associations and Groups Macra (Young Farmers Association) Forestry Associations
	Environmental Orgs	Range of non-governmental organisations (NGOs) generally promote policies to improve sustainability in areas such as climate change, biodiversity, tree-cover, resource efficiency, transport, planning and water quality
	Networks, not for profit organisations, charitable trusts, foundations.	Farm Safety Partnership Breed societies (e.g. cattle, sheep, horses) Irish Shows Association (national representative body of Agricultural Shows) National Rural Network (NRN) Animal Health Ireland (AHI) Agricultural Science Association Irish Grassland Association Nuffield Scholarships Ireland Royal Dublin Society Agricultural Committee National Ploughing Association Agricultural Trust

*Note, the list above includes the majority of organisations but may be incomplete.*

## **4.2. Public policy, funding schemes, financing mechanisms, advisory service providers**

Public policy for agriculture for the short and medium term will be summarised in the new Agri Food Strategy 2030 which will set out a future for Irish Agriculture encompassing the challenges and opportunities set out in EU and Irish government wide policy documents dealing with economics, climate, water, biodiversity, animal and human health etc.

In Ireland, the majority of funded schemes that farmers avail of which are supported by advisors are administered by DAFM. Under recent CAP funding there has been a shift in scheme design with some new initiatives under Pillar II of CAP that provide an opportunity for farmers and advisors to engage in training and capacity building. Recent examples of this were the Knowledge Transfer Groups programme which built on the work done previously under initiatives such as the Dairy Efficiency Programme (DEP), Beef Technology Adoption Programme (BTAP) and Sheep Technology Adoption Programme (STAP).

In addition, some large technical environmental schemes such as the Beef Data Genomics Programme (BDGP) in which 30,000 farmers participated, and the Green Low-Carbon Agri-Environment Scheme (GLAS) which had 48,000 farmer participants included a training component delivered by approved FAS trained advisors. There has also been some funding of projects under European Innovation Partnership (EIP) which has provided an opportunity for farmers, advisors, researchers and industry to work on challenges and projects of interest in their local region.

The anchor point for the majority of public and private advisory services in Ireland is an annual application for financial support under CAP. Private advisors charge individual clients for such services. Depending on the individual private advisor, they may in addition offer a range of other services for fees including preparation of tax accounts, agricultural auctioneering, assisting farmers with legal matters and compulsory purchase orders and analytical services etc. Some private and industry advisors specialise in areas such as the supply of detailed agronomic advice closely linked to supply of inputs and a number are also heavily involved in EIP projects.

Public advisors (Teagasc) are funded by a mixed model of funding where individual farmers will pay for direct services in a similar way to the private advisor. Public advisors also collect fees for provision of education courses. Funding from industry allows the public advisors to dedicate time and resources to joint industry initiatives that are relevant to both parties. Government funding of Teagasc via DAFM allows public advisors to deliver a public good programme of information and events on a range of industry wide public good sustainability challenges. It also creates capacity for public advisors to be accessible to farmers who may be remotely located, have low income or require support in an area of farming that is emerging. Public advisors also are available to provide support to farm families who find themselves in an individual crisis situation (accident etc.) and they can also be mobilised to provide support to all farmers or farm sectors or regions when crisis events occur such as disease outbreaks, flooding etc.

In Ireland there is a recognition that Government does not need to provide the sole source of finance for all services offered by advisory services. However it does need to support some capacity the provision of public goods which otherwise would not be provided due to market failures. In future this will include supporting a healthy AKIS.

### **4.3. Human resources and methods of service provision**

Over the last thirty years the advisor numbers have fluctuated as the work programme and ability to change fees is closely aligned to cycles of CAP funding. Currently it is estimated that there are approximately 800 advisory FTE active in Ireland with approximately 300 publicly funded, 300 privately funded and 200 associated with industry. This number will rise when the next cycle of CAP funding commences.

Public advisors use a range of service provision models including farm visits, office and phone consultations, discussion groups, farm walks, open days, seminars as well as using media channels to deliver their work. There has also been an increase in the activity of advisors on digital and social media.

Since the Covid-19 pandemic in March 2020, there was a sharp increase in the use of digital tools to provide advisory services such as email, text, Whats App, conference calls, closed group webinars, open webinars as well as using all of the digital and social media channels. There has been a sharp increase in short videos, and podcasts etc.

In general there has been a move towards the facilitation of peer to peer learning and innovation broker advisory roles, with less dependence on one to one instruction and advice. In response Teagasc has invested strongly in the continuous professional development of its staff and has adopted some of the Certificate for European Consultants in Rural Areas (CECRA) framework to methodological skills training. This participatory approach to advisory methodology training has been accepted by advisors and complements their experience and technical knowledge.

#### **4.4. Clients and topics**

In Ireland, it is likely that we will see in future a strong cohort of full time family farms – predominantly in dairy and tillage who can advance their businesses to generate an income that is comparable to other careers. This will ensure that the sector will attract highly educated young people towards a farming career and within the sector there will be capacity to reinvest and adopt new digital and automation technologies. A further cohort of part time farmers who can supplement farm income by “working from home” will also be key to having a dynamic future modern agriculture open to new aspects of diversification and will enhance rural communities.

Ireland has strong heritage, knowledge and commitment to agriculture across many generations. Ensuring the sector is attractive to well-educated and ambitious young people and supported by a strong and dynamic AKIS will be key to its longer term development and success.

All farm families can benefit from the provision of advice from an agricultural advisor. There are a range of areas that are currently being advised on at different

levels of intensity depending on the time of the year, the individual farmers situation and the advisors competence. These include:

- Accessing funding through annual CAP schemes
- Business and infrastructure planning
- Improving work organisation, health and safety
- Annual farm performance benchmarking
- Farm succession and inheritance
- Farm diversification
- Reducing GHG and carbon footprint
- Improved water quality
- Enhancing biodiversity
- Meeting cross compliance and quality assurance standards
- Reduced use of anthelmintic
- Nutrient management planning
- Integrated pest management
- Grassland and crop management
- Animal and crop breeding
- Animal and crop nutrition

## **4.5. Linkages with other AKIS actors/knowledge flows**

A comprehensive analysis of the Irish AKIS is required to establish the exact “health” of the various linkages and knowledge flows between a range of organisations. Boyle, 2012 commented that there are some strong and some weak connections between many of the key stakeholders. Examples of strong connections are Teagasc advisors-stakeholders and Teagasc research-external research while weak connections exist between external research-stakeholders and Teagasc advisors-external advisors.

## **4.6. Programming and planning of advisory work**

The overall vision for the Irish agri food sector is set out in the Food Wise 2025 document. This strategy is collated by the Department of Agriculture with the input of all sectors of the industry. It will shortly be updated to an Agri Food Strategy 2030 and the new document will reflect all of the important drivers of change across the sector – economic, social and environmental. This document along with Ireland’s new CAP strategic plan will largely guide the focus of advisory work over the next 5-7 years. It is anticipated that measures to enhance the AKIS and improve the adoption of digital technology will be prominent in the new policy documents.

From this, individual CAP funded initiatives will emerge that all advisors public, private and industry will engage with. Organisations like Teagasc will align their Statement of Strategy, National Programme and Regional and Business Plans to the new strategic vision while smaller individual organisations will largely engage with individual schemes that best suit their capacity and individual business model.

## **4.7. Advisory organisations forming the FAS and evaluation of their FAS implementation**

The purpose of the Farm Advisory System (FAS) is to aid farmers in meeting their Cross Compliance obligations and to help farmers avoid financial reductions under Cross Compliance, in respect of Statutory Management Requirements (SMR) and Good Agricultural and Environmental Condition (GAEC).

DAFM manage the Farm Advisory System register in Ireland. It is a register that is accessible to all advisors – public, private or industry. Advisors can get on to the register by providing proof of an agricultural science qualification (Level 8) – including certain mandatory core subjects. Advisors then need to attend regular updates and training to be retained on the register and they also need to attend specific training to be allowed to service particular schemes by DAFM.

DAFM do not allow advisors access to their online systems to submit scheme applications on behalf of their clients unless they have a suitable FAS training record.

FAS advisors are available to assist farmers with scheme applications and guide them on cross compliance matters. However it is not mandatory for any farmer to use a FAS advisor.

Public and private advisors would like to see aspects of the FAS system improved. For private advisors the issues largely lie around compensation for the time they take away from their business to attend training. For public advisors it is the lack of recognition of prior learning and thereby duplication of time attending training due to a “one size fits all” approach to the provision of training by DAFM. Also there tends to be a different approach to the provision of training and accreditation for FAS in comparison to other areas such as the Sustainable Use Directive (SUD) and other schemes.

A selection of the type of the training topics provided to FAS advisors are set out below:

- Statutory Management Requirements (SMR)
- Good Agricultural and Environmental Condition (GAEC)
- Water Framework Directive (WFD)
- Sustainable Use of Pesticides Directive (SUD)
- Basic Payment System, Entitlements, Land Eligibility and Greening
- Climate Change
- Nitrates and Environmental Impact Assessment (EIA) Regulation
- Areas of Natural Constraint (ANC) Review
- Targeted Agricultural Modernisation Scheme (TAMS)
- Antimicrobial Resistance (AMR)

## 5. Summary and conclusions

The Irish AKIS has some strong features and advantages compared to other countries. Equally it has some disadvantages and challenges that are not unique to Ireland, and are seen in many other countries.

The relative importance of technical knowledge and administrative (scheme) knowledge varies between countries and farming systems as well as service provider. In Ireland the relative importance of CAP funding to the vast majority of Irish farmers mean that all providers of advice and support in the AKIS must be knowledgeable on both administrative and technical matters to guide farmers towards a sustainable future. Ireland has many strong actors across the AKIS including:

- (i) *Department of Agriculture, Food and Marine*
- (ii) *Teagasc*
- (iii) *Farmer Representative Organisations*
- (iv) *Irish Food Industry, ICOS, Bord Bia, ICBF and Sheep Ireland*
- (v) *Private and Industry Advisors*
- (vi) *Vets and Animal Health Ireland*
- (vii) *Agri- Media and Agri-Networking Agencies*
- (viii) *Other Policy and Regulatory Departments and Organisations*
- (ix) *General Business Services*
- (x) *Rural Diversification and Enterprise Agencies*
- (xi) *General Education Providers*

Over the last thirty years the development role of the agricultural advisor has evolved from a “teaching” role to a facilitator of “knowledge exchange” role. This has been enabled by the increased standard of education among farmers, the increased participation in peer to peer learning environments such as discussion groups and the increased availability of farm performance data.

Outside of advisors, farmers can access data and information from a multitude of professional digital sources as well as from each other using a range of social media channels and networks. Policy organisations and agencies also use these channels to influence the information that is accessed by Irish farmers. This has also changed the role of the advisor from an information provider to a navigator.

In Ireland, publicly funded, mixed funded and private funded services coexist. This provides farmers with a choice of provider. It also recognises that Government should not be the sole provider of finance to fund all of the services offered by a public advisory service, but it does need to support the provision of public goods which otherwise would not be provided due to market weakness or failure.

Funded programmes and initiatives such as joint industry programmes and EIP projects can provide the opportunity for individual AKIS actors to collectively work together to assess the research information available and communicate this to their target audience as well as communicating back to the research provider around future requirements in a powerful way.

## 6. Acknowledgement of partners, information sources and gaps

The report builds on the details previously summarised in the PRO AKIS project:

Prager, K., and Thomson, K., 2014. AKIS and advisory services in the Republic of Ireland, Report for the AKIS inventory (WP3) of the PRO AKIS project.

It also reflects on recent documents prepared on the AKIS as part of the Department of Agriculture's CAP consultative process.

Barrett, P., 2020. Background Paper on the Agriculture Knowledge & Innovation Systems (AKIS), DAFM CAP Consultative Committee Working Paper, 2020.

It also draws from previous reports, papers and presentations prepared by Teagasc and others, most notably:

DAFM Annual Review and Outlook for Agriculture, Food and the Marine 2020.

Maher, P., 2020. Evolution of the Teagasc Advisory Service in the Irish AKIS, including recent experiences responding to Covid-19, Conference of Farm Advisory Service (FAS) Serbia 15 Dec 2020.

Maher, P., Hanrahan, K., 2020. Overview of Irish Agriculture and Food Roadmap, (draft).

Buckley, C. Donnellan, T., 2019. Teagasc National Farm Survey 2019 Sustainability Report.

Recalibrating Advisory Services for a new era in Irish farming, 2019 Jim Power, Consultant for the Agricultural Consultants Association.

EIP-AGRI: Ireland's Operational Groups 2019.

Kelly, T., Brady, M., Bolger, P., 2013. Evolution of Advisory Services in Ireland, Knowledge Transfer Conference 2013 'Future of Farm Advisory Services, Delivering Innovative Systems'. Teagasc, Dublin.

Boyle, G., 2012. Enhancing Irish Agricultural Productivity Through Technology Adoption: A Critique of the Irish Agricultural, Knowledge and Innovation System (AKIS), in: Heanue, K., Macken-Walsh, A., Maher, P. (Eds.), Teagasc Best Practise in Extension Services - Supporting Farmer Innovation. Teagasc, Aviva Stadium, Lansdowne Road, Dublin 4.

Teagasc Education Vision Report, 2018.

Otherwise, the data and report commentary and content is based on the professional assessment of the author who works for Teagasc and has 25 years of experience working in Ireland and abroad in the public and private sectors of the AKIS, and who has worked closely with policy makers, regulators and AKIS actors over the last 10 years at national and EU level.