



Prospects for Farmers' Support: Advisory Services in European AKIS
WP 4 – AKIS ON THE GROUND: FOCUSING KNOWLEDGE FLOWS SYSTEM | Topic 2
Country Report for Germany

The capability of extension and advisory services to
bridge the research and knowledge needs of
farmers

*Highlighting the Role of Experimental Stations for
Knowledge Exchange and Provision to Farmers in Bavaria,
Germany*

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List of Acronyms

PRO AKIS	Prospects for Farmers' Support: Advisory Services in the European Agricultural Knowledge and Information Systems'
OsfA	Offices for Food, Agriculture and Forestry (Ämter für Ernährung, Landwirtschaft und Forsten)
OfA	Office for Food, agriculture and Forestry (Amt für Ernährung Landwirtschaft und Forsten)
BFA	Bavarian Farmer's association (Bayerischer Bauernverband)
BSRCA	Bavarian State Research Centre for Agriculture (Landesanstalt für Landwirtschaft)
FBAA	Federal Bavarian Academy for Food, Agriculture, and Forestry (Staatliche Führungsakademie für Ernährung, Landwirtschaft und Forsten)
BSTCP	State board of trustees for crop production (Landeskuratorium für pflanzliche Erzeugung in Bayern e.V.)
GAAH	Growers Association Animal Husbandry in Bavaria e.V. (Landeskuratorium der Erzeugerringe für tierische Veredelung in Bayern e. V)
BMA	Bavarian Ministry for Food, Agriculture and Forestry (Bayerisches Staatsministerium für Ernährung, Landwirtschaft und Forsten)

Executive Summary

This report is part of PRO AKIS' WP4, which deals with the relations between research and practice in a context of changing roles of public and private actors within national Agricultural Knowledge and Information Systems (AKIS). In this report, the contribution of experimental research stations in bridging the gap between farming practice and research is specifically explored. The study is based on empirical research undertaken in Bavaria, Germany.

The Bavarian AKIS is characterised by a dense infrastructure comprised of a high number of public actors and various professional organisations and associations. 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. Agricultural advisory services are provided by several actors who cooperate in the 'combined advisory system' – a reform model that had recently been developed and implemented. Previous official advisory services are now reduced to (farmers' and societal) providing only welfare-oriented advice, advice on administrative and investment issues and farm development. Advice on production-related issues can be co-financed publically, but shall be sought with private advisors from various professional associations. Finally, farmers' associations and others also offer advice on specific topics.

Beside the elaboration of an overview of the Bavarian AKIS, an in-depth attention was given to the role that experimental research stations have in generating, testing and disseminating solutions for upcoming problems, in how far they are integrated and connected with other AKIS actors and especially with farmers. To deal with this research objective, literature research and 13 expert interviews with advisors and farmers were undertaken in Bavaria, Germany, in order to understand the role, opportunities and limits of publically-funded experimental stations in bridging the gap between farmers' demand for knowledge and research practices.

The results show that direct contact between farming practices and research activities are low. Farmers can formulate research-related questions and communicate them to the public agricultural offices, which will then forward the questions to the relevant divisions in the Bavarian State Research Centre for Agriculture (BSRCA). The experimental stations are not directly involved in generating research questions and storing knowledge. The BSRCA acts as a relay station for research questions and results. Here, new research questions are proposed and new research results are statistically verified. However, their members have no direct contact with the farmers. Farmers are notified about new insights via print media such as newsletters and professional journals or conferences and field days. All in all, the farmers see little connection between experimental research stations and their own farming practices.

The study thus indicates that public knowledge generation and farming practices are not well connected and that this phenomenon has even worsened. In response, farmers obviously seek contact with private advisors or advisors from industry and exchange information with their colleagues. New efforts seem necessary to ensure a bridge between publically funded research and farming practices in Bavaria.

1 Introduction

One of the key objectives of PRO AKIS is to comparatively explore and describe selected forms of advisory services and agricultural knowledge flows in Europe within the broader context of AKIS, accounting for the diversity of supply and demand conditions across different countries, regions and other local settings and diverse types of farmers.

Recent studies, expert interviews and evidence from stakeholder involvement indicate that one major deficit of European AKIS is the weak link between (public) research organisations and agricultural practice. In this study, the capabilities of the advisory services to bridge the gap between research and practice and to support farmers' demand for timely and reliable knowledge is thus of specific interest and will be explored in a series of four case studies in different European countries. The aim of the investigation is to describe and compare the roles, the opportunities and the limits of extension and advisory services in acting as a bridge between farmers' demand for knowledge and actual research practices, especially with regards to providing public goods and ecosystem services and to develop capacities to respond to global challenges. Hereby, particular attention is given to the institutional diversity of advisory services (e.g. governmental, privatised, mixed, commodity-based, client-based extension) and their procedures used to bridge farmers' needs and research practices. Through empirical investigations, an improved understanding of the functions played by experimental research stations to bridge farmers' needs and research efforts shall be obtained. The linkages between the different actors, as reflected by knowledge exchange, shall be unraveled with the help of the concept of knowledge flows. In addition, infrastructures of knowledge systems are evolving and changing. The option that advisory services might undergo changes or may even be bypassed by farmers and become obsolete will be considered.

In the German case study, an in-depth look will be taken at the role of publically-funded experimental research stations in Bavaria, located in South-East Germany, in order to understand their role, opportunities and limits in bridging the gap between farmers' demand for knowledge and research practices. To deal with this research objective, the following research questions were posed:

- How can farmers obtain reliable and relevant knowledge from advisory services (public, private and voluntary) in Bavaria?
 - o Which sources can be used by Bavarian farmers to obtain knowledge?
 - o Are there different types of media or other sources for knowledge acquisition?
- Where can Bavarian farmers obtain information and support for modern and continuous development?
 - o Who operationalises the knowledge and sets development trends?
- Where do the research questions in the experimental research centres come from?
- How is the knowledge that is obtained practically put into use?
- How are research and practice integrated and is there a specific role for advisory services?

2 Selecting and delimiting the case-study

The aim of this report is to investigate and document one key issue in the complex and heterogeneous AKIS in Germany that was identified during the course of the PRO AKIS German inventory. Due to the federal structure of Germany, the majority of agricultural advisory services and knowledge systems are governed by the German states ('Bundesland') themselves. Currently, a broad diversity of institutional and organisational infrastructures exists. E.g., there are public as well as private advisory services, for profit and non-profit ones, including professional associations, (self-organised) farmer circles, cooperatives that are frequently farm-based initiatives, etc. The importance of private advisory services, however, differs between the states. In all cases, however, the mandate and responsibility for agricultural advice remains at the state level. Hence, overall vertical integration from national to federal state levels is low. Figure 1 shows the predominant institutional structure of the advisory services in the different states (cf. Thomas 2007, 1-5):



Figure 1: Prevalence of different providers of advisor services in Germany (Translated from: Thomas, 2007)

As figure 1 shows, the South of Germany is characterised by official agricultural extension services. In Germany's North-West, advice is predominantly provided by chambers of agriculture. In the North-East,

private advisory services are prevalent. These differences indicate little structural homogeneity amongst the German states, which, as a consequence, make exchange and cooperation between the different federal states concerning agricultural advisory services very difficult.

Based on these findings, the German case was designed in order to better understand (i) the potentials and the limitations that state-level, public research offers for the AKIS and specifically for the research questions and knowledge needs that farmers have and (ii) the role(s) that advisory services play in bridging the gap and connecting (this) research organisation and practice. As the PRO AKIS German inventory had revealed that public experimental stations play a prominent role for generation of agricultural knowledge and information at state-level (Paul et al. 2014), the decision was made to focus this case study on public experimental stations as the representative research actor. Given the aforementioned AKIS features in Germany, the study was limited to the analysis of one state. The case of Bavaria was chosen because (i) this state is the most 'agrarian' one in Germany, comprising 90,000 or nearly one third of all German farms, which also means that farmers and farming get relatively high political attention, (ii) a recent reform of the agricultural advisory system has been completed in 2008 (Pusch and Klupak 2015; StMELF Bayern, no date A) and (iii) personal contacts into the ministry existed which supported the conduct of the empirical part of the study. Given the institutional diversity of the German state-level AKIS, it has to be emphasised that this case is not representative for other German states. Nevertheless, the empirical evidence of the study may be relevant for the general understanding of similar institutional settings.

3 General case study description

3.1 The Bavarian AKIS

The Bavarian AKIS is predominantly shaped by public organisations. As figure 2 shows, administrative services, research, education and advice is broadly provided by the Bavarian Ministry for Food, Agriculture and Forestry and its subordinated bodies.

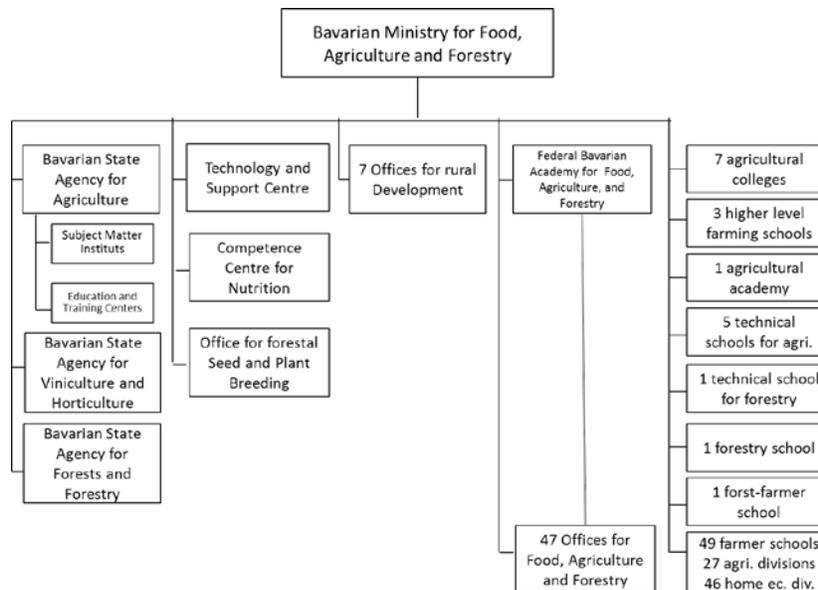


Figure 2: Structure of public AKIS infrastructures in Bavaria (Source: Translated from StMELF Bayern, no dateB)

As shown on the right side of figure 2, the Bavarian State Agency for Agriculture runs a number of education and training centres related to food, agriculture and forestry. In addition, there are 47 offices for food, agriculture and forestry which are dispersed throughout Bavaria. These offices are divided into two thematic areas. On the one hand, they consist of five divisions covering agricultural themes and on the other hand the offices cover themes related to forestry. Divisions dealing with agriculture include financial aid (L1), education and advice (L2), subject matter centres (L3), audit service (L3,P) and horticulture (L4).

Two divisions are of particular interest for this report: division L2 (education and advice) and its subject area 'agriculture, focus area: crop production (L2.2) and division L3 (Centre of Expertise) and specifically the Centre of Expertise for agro-ecology (L3.2). The tasks of division L2.2 include, amongst others, the provision of farm-level, socio-economic and entrepreneurial advice for farm development including public welfare interests, environmental, resource-protecting and sustainability concerns and the support of private advisory services operating in this field (OFA-PH NoDateA). The Centre of Expertise for agro-ecology have the aim to develop cross-regional advisory messages, create supportive material and to support the knowledge generation and the knowledge transfer between universities, research stations and agricultural practitioners (OFA NoDate A, B) (OFA-PH NoDateB). Figure 3 shows the distribution of the relevant offices in Bavaria and their associated Centres of Expertise (cf. BMA, no date C).

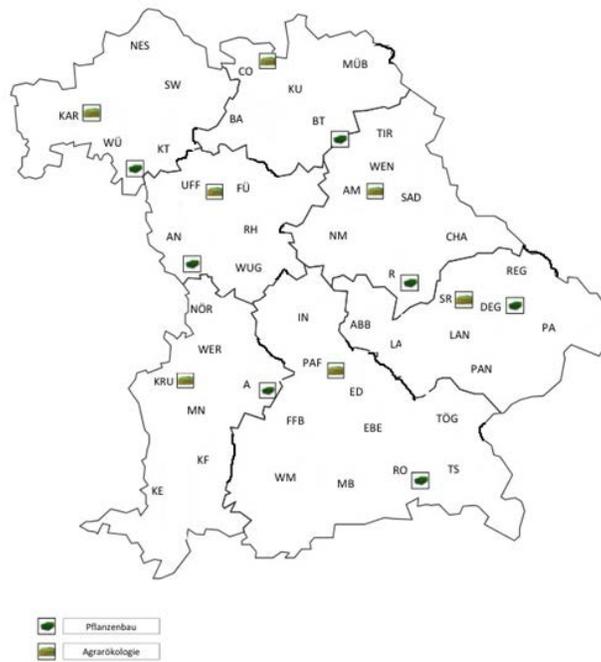


Figure 3: Location of offices and subject matter institutes under consideration (modified from STMELF, no dateD)

Since 2008, the public bodies within the AKIS of Bavaria have been complemented by private advisory bodies (cf. Agrarbericht, 2014). The aim of introducing a *combined advisory system* has been to offer farmers “neutral, affordable, competent and spatially inclusive and comprehensive advice” (BMA, no dateE) and to provide farmers with easy to use, structured and topical knowledge. The combined advisory system is defined as “the collaboration of public agricultural extension and non-public advisory services with a harmonized range of services offered” (BayAgarWiG 2006).

Private advisors are hereby mostly active in the field of production-related farm-level advice. Each Bavarian farmer, independent of the type and size of his farm, can make use of the combined advisory system. These services have to be paid by farmers themselves, but are subsidised with public funds of the Bavarian State (cf BMA, No DateE). Partners of the *combined advisory system* are the State board of trustees for crop production (SBGAAH TCP) ,Landeskuratorium für pflanzliche Erzeugung in Bayern e.V.) (LKP)’, the State board of Growers Associations for Animal Husbandry in Bavaria r.o. ((Landeskuratorium der Erzeugerringe für tierische Veredelung in Bayern e. V.’ (LKV)) , the accounting agency of the Bavarian Farmers Association LC (BBV Buchstelle), the Ecovis-BLB Accountancy LC, the ‘Kuratorium Bayerischer Maschinen- und Betriebshilfsringe e.V.’, the ‘PC-Agrar LC’ and the ‘BBV Landsiedlung LC’. The main task of all partners in the *combined advisory system* is the provision of advice to farmers on the “production of high quality food products, the production of renewable resources for raw materials and energy, the maintenance and the development of an attractive cultural landscape, the adaptation to new challenges as e.g. climate change, water protection or agro-biodiversity and the adaptation to the dynamically changing markets and the achievement of appropriate income” (BMA, No DateE). Private advisors also offer support concerning production techniques, as for example choosing breeds or feeding mechanisms.

Moreover, private advisors give advice concerning farm management, mechanisation and cooperation. Private advisors can also be active in construction advice, although this is primarily the knowledge centres associated with the official advisory services (cf. BMA, No Date F).

Generally, all advisors which meet the criteria recognised by the advisory services within the combined advisory service can become partners of the public advisory offices in Bavaria (cf. BErAnerkR, 2014). Application for recognition has to be made to the “Führungsakademie” (Federal Bavarian academy for Food, Agriculture and Forestry) by 30th of September for the following year. The “Führungsakademie” checks if the advisor meets the criteria and gives suggestions to the ministry of food, agriculture and forestry concerning their final decision (cf. BMA NoDate A; BerAnerkR, 2014).

Since the introduction of the combined advisory system, the official agricultural extension service limits its activities to “welfare-oriented advice, advice concerning administrative performance, investments and the development of the farm” (OFA-Sw, NoDate). The welfare-oriented advisory service also includes environmental topics (cf. OFA-Sw, NoDate).

4 Methods and data collection, local stakeholder involvement

To deal with the research question, it was necessary to speak with representatives of the offices and expertise centres described in this chapter. To do so, the Ministry for Food, Agriculture and Forestry in Bavaria was contacted initially. In addition, contact was made with the Bavarian State Centre for Research in Agriculture (BSCRA). Through these two institutes, first contacts were established with knowledge-generating and organisations that provide advice. In addition, the farmer association and the state institute for plant production in Bavaria were contacted to get a complete overview of all advisory organisations.

Methodologically, the case study was based on a qualitative approach. A comprehensive literature review and the study of grey literature thus laid the basis for the description of the German and the Bavarian AKIS. Knowledge systems and their performances as well as knowledge processing and exchange practices are complex topics and advice is provided through various channels. Thus the literature review helped the researcher to compile the necessary knowledge for conducting expert interviews in the public organisations (MEUSER UND NAGEL 1991, 448). A semi-structured interview guide was developed and applied in 13 interviews (vgl. MEUSER UND NAGEL 1991, 486) which allowed for the collection of similar information throughout the various interviews.

In order to obtain a general overview, it is necessary to not only investigate the organisations providing advisory services, but also those farmers receiving this advice. Interviews with experts and farmers were conducted across all regions of Bavaria. To limit the amount of data, the focus of the study was on crop production and societal questions, for which advice is provided in the Centres of Expertise for agro-

ecology. For the study, 13 interviews with representatives of the various AKIS actors in Bavaria were planned and conducted (cf. table 1).

Table 1: Interview partners of the Bavarian case study

Date	Organisation	Type of Interview
25.09.2014	Experimental stations, educational and subject matter centres	Telephone interview
29.09.2014	Bavarian State Research Centre for Agriculture	Telephone interview
30.09.2014	Experimental stations, educational and subject matter centres	In person
30.09.2014	Experimental stations, educational and subject matter centres	In person
30.09.2014	Bavarian farmers' association	In person
08.10.2014	Experimental stations, educational and subject matter centres	Telephone interview
04.11.2014	office of nutrition, agriculture and forests	Telephone interview
26.11.2014	Farmer 1	Telephone interview
27.11.2014	Farmer 2	Telephone interview
05.01.2015	Farmer 3	Telephone interview
11.12.2014	Bavarian Ministry of Food, Agriculture and Forestry	In person
27.01.2015	Bavarian State Research Centre for Agriculture – statistic work	Telephone interview
27.01.2015	Bavarian State research Centre for Agriculture – research stations	Telephone interview

The empirical part of the study began with an expert interview with a representative from the State Ministry of Food, Agriculture and Forestry. Next, contacts were established with members of the BSRCA, the Bavarian Farmers' Association and the Landeskuratorium für pflanzliche Erzeugung. Later, interviews took place with recognised private advisors and with farmers.

5 Results

5.1 Actors and sources of knowledge: Where the knowledge comes from?

To find out where farmers can obtain knowledge and which of the bodies mentioned in chapter 4 are relevant sources of knowledge, expert interviews were conducted in the various institutes mentioned and with farmers in Bavaria. To deal with this issue, we asked:

- How can farmers obtain reliable and relevant knowledge from advisory services (public, private and voluntary) in Bavaria?
 - o Which sources can be used by Bavarian farmers to obtain knowledge?
 - o Are there different types of media or other sources for knowledge acquisition?

The *Bavarian State Research Centre for Agriculture (BSRCA)*, founded in 2003, is an umbrella organisation consisting of several offices and agencies and is governed directly by the Ministry for Food, Agriculture and Forestry (see fig. 2). The core tasks of the BSRCA are practical and applied agriculture research, vocational training, agricultural advice and law enforcement (cf. BSRCA No DateA). The BSRCA

is thus the “knowledge and service system for agriculture” (BMA, No DateG). They provide services to farmers as well as public administration, private advisors, associations and members of industry, business and politics (cf. BMA, No DateG). The BSRCA is divided into the core-competence centre for food, six divisions and nine institutes (see figure 4).

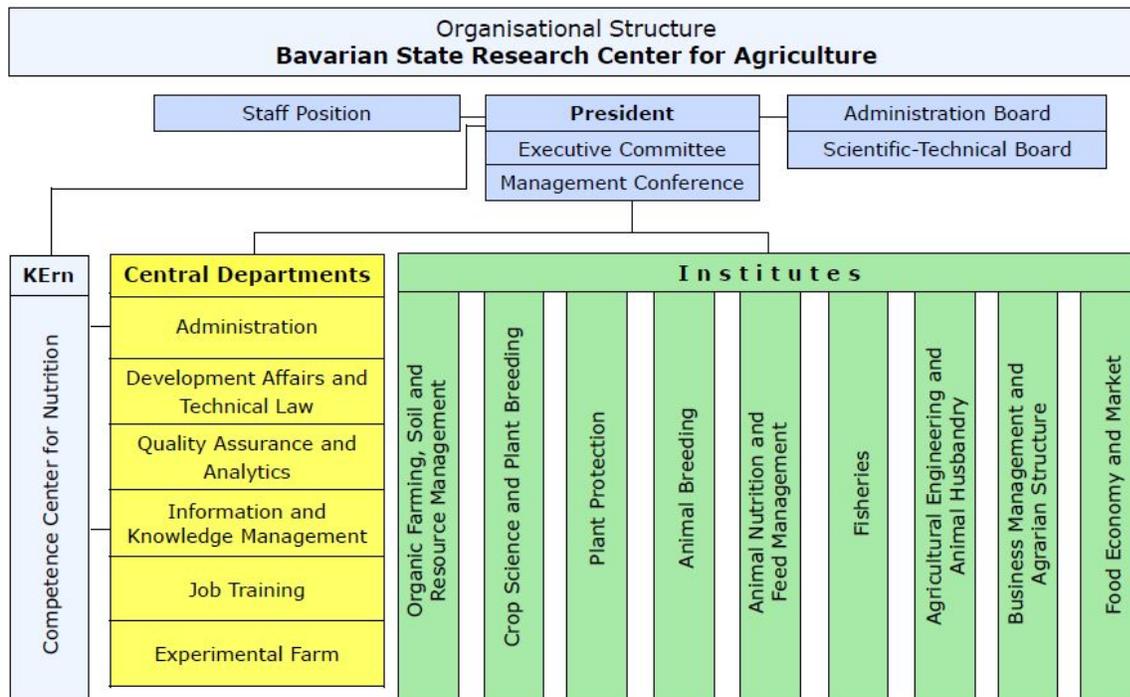


Figure 4: Organisation BSRCA (Lfl, NoDateA)

Each of the nine institutes of the BSRCA specialise in one of the following topics each: agro-ecology, crop production, crop protection, animal breeding, animal nutrition, fishery, animal and technique, agro-economy and markets. The institutes are supposed to work towards “project-guided solutions for the future” (BSRCA, No DateB). The work programmes of the institutes are set for five years and define the working themes and projects dealt with during this period. The work programmes comprise complex and interdisciplinary questions, such as climate change, which are dealt with by several institutes within the regional office. The collaboration offers a wide perspective for analysing the effects of agriculture. The institutes are supported by several education, knowledge and training centres (LVFZ). These centres support the knowledge generation of the institutions (cf. BSRCA, No DateB). The distribution and number of the different bodies can be seen in figure 5.



Figure 5: Locations of institutes associated with the BSRCA (translated from BSRCA, No DateC)

The education and training centres compile the generated knowledge and organise education and dissemination events to transfer the available knowledge into practice such as through workshops or field days. Members of the public agricultural authorities act as teachers in these centres. These centres are thus an important bridge between research and practice. They also offer their equipment and property to partners to conduct experiments and support the BSRCA in conducting experiments (cf. BSRCA No DateB). Yet, although the BSRCA appears to play an important part in bridging practice and research, they do not interact directly with farmers but only via the education and training centres.

In the public institutes, it was stated that the first contact point for farmers to seek information and advice is threefold. For advice on societal, judicial and environmental issues, farmers may contact one of the 47 offices for food, agriculture and forestry dispersed in Bavaria (see fig. 2). For information on farm management issues, farmers can contact members of farmers associations and for questions regarding production issues, farmers can contact one of the recognised private advisory services.

In the offices for food, agriculture and forestry, the department of education and advice is responsible for the advisory services. Here, farmers can contact the advisory services by phone or e-mail, although this contact seems to rely on personal links than on formally acknowledged functions: “...I can contact (them), but my experience is that this doesn't always work. I know the people working there. When I have a specific question, I call them directly” (Farmer 3). In addition, the public offices organise thematic events and conferences where they invite experts and members of the experimental research stations and others to give talks concerning certain topics. Also, several printed leaflets and information are

available concerning a range of topics, including information on public and private advisors and associations, education events and recent research results. Contact between farmers and members of public advisory institutes is, however, usually lacking as numbers of staff members are low and therefore their time is limited. In addition, the interviewed farmers stated that contact with staff members of public advisory services needs to be sought by the farmer himself. Unless the public offices organise field days or seminars, they do not contact farmers individually. However, one farmer sought contact with the public advisory services two or three times per month during the vegetation period. A further farmer stated that the advice provided by the public service is “rudimentary”, suffering from personal cuts and lacking specific experts on, for example, plant breeding. Consequently this farmer only sought this form of advice three to four times a year.

A further- and according to officials frequently- sought, source of advice is the Bavarian Farmer’s Association (BVV). This association has 6,500 local groups dispersed throughout Bavaria. The association runs several offices in Bavaria, of which 55 have their own advisors which visit farmers on their farms. However, none of the interviewed farmers mentioned obtaining advice from a farmer’s association.

While one farmer additionally contacted a private advisor, another farmer did not have contact with a private advisor, because he was not convinced of their quality. Instead, this farmer made use of conferences and professional journals as their knowledge sources. Another farmer indicated that they have regular contact with advisors from specific firms (5-6 times per year) and advisors active in the combined advisory system (3-4 times a year). Both types of private advisors were contacted for production related questions.

5.2 Processes and methods to exchange knowledge

In order to identify the processes and methods to exchange knowledge, the following research questions were asked:

- Where can Bavarian farmers obtain information and support for modern and continuous development?
 - o Who operationalises the knowledge and sets development trends?

It was stated that the 47 offices for food, agriculture and forestry are the main agents for processing and exchanging knowledge. Here, farmers can reach the agents via phone or e-mail. The Bavarian Farmer’s association, in contrast, only has a minor role since their support mainly focusses on advice for farm successions. For organic farmers, the public research and experimental station ‘Kringell’ offers additional advisory services to support the conversion of farm practices from conventional to organic.

Fairs, conferences and workshops are a further method to process and exchange new knowledge. These offers were also frequently utilised by the interviewed farmers. Conferences and open workshops are organised by the agricultural offices, the experimental and training centres and the Bavarian academy where farmers and advisors may attend with employees of the agricultural offices, research and education centres and experimental stations acting as lecturers. Information on research and on political decisions was also spread through print media, which was also a source of information to the

interviewed farmers: *“The BSRCA publishes its research results in the Bavarian weekly paper. Print media play a big role. Specialized journals for example don't only present the vegetation but also the research results”* (Farmer 1).

There are

- Various leaflets and brochures from the combined advisory service partners, from members of the public advisory service, the associations etc.
- The association of agricultural education has a regular newsletter.
- The farmers' weekly ('Landwirtschaftliches Wochenblatt') presents descriptions and results from agricultural experiments – and according to the farmers' association it is one of the most important sources of information for farmers.
- The results of all experiments of the Agricultural Agency are published annually.

Generally, conferences and fairs offer numerous possibilities to inform farmers about recent developments and innovations in agriculture. The information provided at these events is almost exclusively executed by the regional agency for agriculture.

5.3 The knowledge contents addressed by experimental research stations

To generate questions for research in the experimental stations, twice a year the regional office for agriculture invites experts from all public offices and subject matter institutes as well as experimental stations to jointly discuss new research questions. The subject matter institutes will propose research questions from real-time examples as they are in continuous contact with practitioners and are responsible for documenting the need for this knowledge. Also the experimental stations for crop production are in frequent contact with practitioners and are able to bring in practical research questions. Farmers, in contrast, have few opportunities to directly formulate or influence research questions themselves: *“We are not given the opportunity to influence the research questions ourselves. I think the advisors hand over the problems they notice”* (Farmer 2). They can only contact the office of food, agriculture and forestry in their vicinity to suggest research questions for the future: *“Once I've tried to get involved in the discussion, that didn't work out”* (Farmer 3).

On the national level, the association of Chambers of Agriculture meets twice a year together with representatives of the official and the private advisory bodies from the various German states. These meetings serve as a forum for exchange on the state of art and on ongoing experiments across the different German states. During these meetings, the state of art of agricultural research is discussed as well as the running of different experiments. Open research questions are also revealed and the appropriate experiments to generate the necessary knowledge are also revealed.

The education and training centres may also develop their own research questions which are often the result of running experiments or open questions remaining after the termination of an experiment. Societal and environmental related questions frequently stem from politics, e.g. how to increase the share of self-grown proteins in the feedstock, how to improve the protection of water bodies and aquifers related to agriculture, etc.

The lack of involvement of farmers in the generation of research questions appears to create a distance between practice and research. One farmer thus assumed that the experimental stations are working closely with universities and politics and are generating research questions in conjunction with these knowledge institutes and public offices. Another farmer states that he poses questions to the office of agriculture or directly to the experimental stations. However, he does not see a connection between the research questions and practice. He argues that *“the regional office does not seek feedback from farmers, they understand themselves as advisors of advisors, not as advisors to those seeking advice. They should pay more attention to farmers seeking advice”* (Farmer 2).

5.4 The role of advisory services in bridging the experimental station and farmers

According to members of the education and training centres, there is no role or formalised function of the private advisors who are partners in the combined advisory system except that of the voluntary collection of information, learning and transmitting it where appropriate. Formal roles are occupied by the agricultural offices and the experimental stations. The BSRCA examines the experimental results through statistical calculations and provides evidence through graphs, tables and correlations. This evidence is then presented in the form of PowerPoint presentations and printed documents and shared with the agricultural offices and the experimental stations. Furthermore, the experimental stations develop best practice recommendations for farmers which are published in journals, in their own leaflets and brochures and on their website.

For the farmers, printed documents are also the first source of information about new research results and knowledge. These are obtained through professional journals at both the regional and national levels, the homepages of experimental stations, and newsletters of the regional agency for agriculture. One farmer stated that he obtains information generated in experimental stations indirectly through advisors of the growers' association. For one of the farmers, this indirect way of receiving information about new research results and knowledge emphasises that the experimental station's member is not interested in establishing contact with the station directly. He bases his argument on the fact that it is not possible to phone and ask questions.

5.5 The knowledge flows of experimental stations

The advisors questioned in this study indicated that communication between the different advisors does not occur in a structured way but through occasional encounters. Thus, they argue for a need to install a more structured way of contacting and collaborating with other advisors in the area. Moreover, former advisors of official agricultural extension services fear that through the current reform, official advisors will drift further and further away from farming practices. They complain that even though they still fulfil the role of teachers in vocational schools, they no longer visit farms themselves.

Indeed, as figure 6 shows, the only form of contact between public and private advisors is through conferences organised by the federal Bavarian academy for food, agriculture and forestry. Some of these conferences are held in the education and training centres and are also open to farmers so that they offer the occasion for contacts among the different AKIS actors.

Figure 6 further shows that subject matter institutes and experimental stations have basically no direct contact with practical farming but communicate uni-laterally via publications in journals, in the ‘farmers’ weekly magazine’ and online. They partially contribute to the generation of knowledge for teaching in the dual and vocational education system. It is the education and training centres and the members of the offices for agriculture which organise workshops and field and farm visits to which farmers are invited and support the bilateral flow of information and the identification of research needs among the farmers.

BSRCA with its education and training centres and the experimental stations also cooperate with similar agencies of other federal states. Amongst others, they exchange information about ongoing research studies and jointly design and implement experiments in different experimental stations in parallel. International cooperation is sought for between Bavaria, Switzerland and Austria, because of the common language they use. Cooperation with non-German speaking experimental stations remains informal to date.

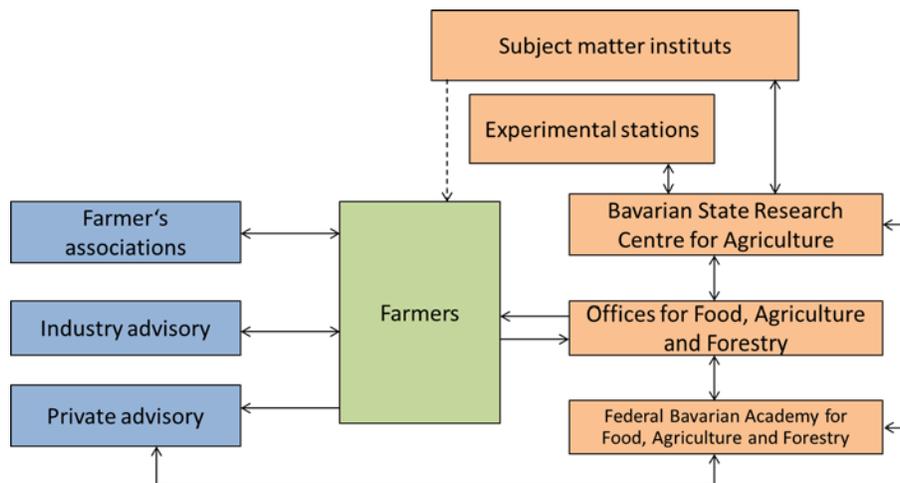


Figure 6: Knowledge flows between research and practice in the Bavarian AKIS Source: Own creation

A further point of contact between practice and publically funded research are the 47 offices of food, agriculture and forestry dispersed in Bavaria. Here, farmers can call or e-mail to ask specific questions. In addition, these offices also organise field days, information events and conferences for which they actively contact and invite farmers.

Looking at private advisory services, figure 6 shows that contact between farmers and farming associations for advice appears to be lacking or small. For instance the farmers interviewed for this study did not mention a use of advisory services. Industry, in contrast, was stated to be a source of information for all the farmers questioned and this contact appeared to be frequent. Private advisors were also contacted by the farmers, yet their services were used on a minimum basis to keep costs low.

6 Discuss and assess the performance of the knowledge flows and identify best-fit practices for advisory services

Performance of knowledge flows

The analysis of the knowledge flows that were revealed through the interviews sheds an initial light on the various linkages that exist between the diverse actors of the Bavarian AKIS. Nevertheless we have to underline that the overview that is created has its limits as it was not possible to meet actors representing all the different status groups. To summarise, it can be stated that:

- There are many types of media and methods used by the public offices to spread knowledge and to establish links between the various partners.
- There are reports of both formal and informal contacts among the actors. Specifically, links between the private advisors from the so-called associated extension service seem to be mostly informal.
- However, little is known about the knowledge flows between farmers and any actor directly involved in research. The farmers themselves did not discuss these relationships.

Role of different actors in the knowledge system

- The dominant governing role in the AKIS is played by the offices for agriculture: they actively keep contacts with all other institutional bodies, notably applied research, and they also seek to involve farmers in multi-actor group events like workshops and conferences. Besides they address farmers via (print) media and through the internet. All in all, it seems that the knowledge linkages induced by the offices for agriculture are performative in the sense that they support the flow of information between the various actors. However, their fulfilment of the advisory function in its proper sense is limited due to their numerous administrative tasks.
- However, the findings of the study show a dense net of interactions among the various units of the agricultural offices and the BSRCA that may or may not consist of formalised linkages.
- The role that farmers play with regard to the generation of knowledge, by expressing their needs and interests, is limited. The most important sources for research questions are the subject matter centres – which of course are in contact with farmers – and the experimental stations themselves.
- Obviously, the BSRCA play a double role – its institutes are responsible for the generation and the operationalisation of knowledge but their ‘clients’ are the experts within the agricultural offices rather than the farmers directly.
- Little is known about the roles the advisors have adopted, notably the advisors of the ‘combined extension system’. There seems to be a competition issue between the members of the agricultural offices and the other advisors.

7 Conclusions

The Bavarian AKIS is a multi-actor net that is characterised by a large number of public actors. Farmers mostly rely on these public actors but are also in contact with farmer-based organisations such as the local farmers' association and with private actors such as private advisors.

With regards to the core topic of this study – the questions whether a) farmers' research interests are known to public research and b) whether they are taken into account we can conclude that:

- There are no direct links between farmers and public applied research.
- Farmers' topics and questions are transmitted via public intermediaries.
- Research is also generating knowledge following its own agendas.
- Only public advisors (= members of the offices for agriculture) have linkages to research. The members of the 'combined extension system' were not mentioned in this regard.

All in all, we can conclude that farmers' integration into the AKIS as active actors are limited and happens only in specific settings organised once or twice per year by public authorities. Mostly, farmers are considered to be, and dealt with as, 'knowledge users'.

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