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AKIS in England – overview and spotlights

A diagnosis study conducted in the frame
of the OECD Corporate Research Programme
January to July 2024

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Abstract

A situation analysis of the AKIS in England was undertaken in the time from January to May 2024 with a special focus on the private sector advisory subsystem's actor constellation and performance based on grey and peer reviewed literature, expert and stakeholder interviews. Results show a particular diversity of actor types, characterised by different organisational features. Thus, it seems that in many places in England, farmers have many choices among service providers when it comes to making use of advisory services. Secondly, the public actor, the governmental department for environment, food and rural affairs (DEFRA) plays a fostering role for offering advisory services in combination with setting up ecosystem service and climate mitigation related measures. Thirdly, a shared conviction of the advantages of peer-to-peer learning formats among all service providing actors in the AKIS was observed as well as a readiness to collaborate with other AKIS actors across all organisational types and subsystems. On the other hand, there is a widely expressed need of coordination among AKIS actors, but no strategic planning or initiative in this regard. Former significant actors have shifted or reduced their roles and influence and, there is a considerable number of hybrid initiatives and innovation networks emerging, which represent and promote an array of new farming practices, technologies and food (production) styles and bridge various communities of farmers, researchers, consumers, citizens and other actors. Although the present study fulfils its objective of providing a (snapshot) overview of the AKIS in England, it equally reveals the blind spots and information deficits with respect to farmers' needs and interests and the degree to which they are satisfied through the diversity of service actors.

Preface

The situation analysis of the AKIS in England was undertaken in the time from January to May 2024 in the frame of the OECD collaborative research programme, which allowed the first author to stay at and cooperate closely with researchers of the Community and Countryside Research Institute (CCRI) at the University of Gloucestershire, England during this time frame. Many thanks for the comprehensive support go to Julie Ingram, Jane Mills, Chris Short, Aimee Morse, Charlotte Chivers, Janet Dwyer, and Marie Steytler as well as to Kate Pressland from CEIA at RAC. Another big thank you goes to all interview partners who frequently at short terms, were open to engage in lively talks, and made it possible that in within a limited time frame, a wide array of information could be obtained. The here presented report is minimally revised version of the initial report shared with partners in July 2024, the authors, November 2024.

Please cite it as: Knierim, Andrea and Julie Ingram (2024) AKIS in England – overview and spotlights. Electronical resource in hohpublica.uni-hohenheim.de. DOI: <https://doi.org/10.60848/11847>

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1 Introduction

1.1 Background

The agricultural sector in England is experiencing constant pressure to adapt to changing socio-economic conditions as well as impacts from major disruptions such as Brexit, input costs and market volatility and climate change. Still, farmers are supposed to proactively position and remain competitive in situation of increasingly globalised markets by simultaneously high societal expectations on positive environmental and social impacts from agriculture (Agra-Europe 2023; The Royal Society 2023).

Providing access to timely and relevant information and innovations are considered key measures to support farmers in their endeavours (Braun et al. 2023). However, information and innovations are not ready-made products, to be ‘transferred’ from one side to the other in a linear and uni-directional way. On the contrary, information becomes actionable knowledge through the active acquisition and integration of new insights into one’s repertoire of experiences, understandings and expertise (Hoffmann et al. 2009). This learning process can happen as an individual effort, but greatly profits from dialogic formats characteristic for e.g. interactive inquiries, exchange with partners, consultation of experienced people etc. (ibid). Similarly, innovations are rarely developed in isolation, but often in dialogue and cooperation between different actors, they come with learning and changes in practices. For the analysis of innovation-induced social or sectoral change, the processes of the development of appropriate solutions, the collective and social learning and the mechanisms to make new knowledge widely accessible are complex. Here, the concept of the agricultural knowledge and innovation system (AKIS) is suitable to support the systemic diagnosis and analysis of such cases (EU SCAR 2012).

The AKIS concept has been developed to illustrate the roles, tasks and functions of different actors or entities engaged in interaction for the generation, operationalisation, provision, application and evaluation of information and knowledge in agriculture and food systems (Leeuwis with van den Ban 2004). The AKIS and in a similar way the AIS (agricultural innovation system) concept have proven their value for research and policy makers to gain a structured overview and in-depth understanding of the diversity of actors, their interdependencies, and their interplay for enhancing sustainable production and competitiveness (OECD 2013; Knierim et al. 2015). Recently, the concept has gained important political attention in Europe by being anchored in the EU CAP to strengthen the role of knowledge infrastructures and innovation support instruments (EU 2021/2115). Considerable expectations exist that the promotion of such infrastructures and instruments will help economic actors in modern societies’ agriculture to adapt to technological change and implement more sustainable practices and business models (EU SCAR 2016).

AKIS’ subsystems such as agricultural education and advisory services have been identified as important sources of drivers for change and innovation in agriculture (EU SCAR 2012; OECD 2015). Advisory services in Europe are characterised by a growing pluralism of actors and their activities. While governmental and farmer-led organisations are the most widespread providers of agricultural advice, there is nevertheless an increasing number of independent private sector actors, both as individual entrepreneurs and in an organised form (OECD 2015; Knierim et al. 2017). In addition to actors formally designated as service providers, so-called hybrid actors offer advice alongside other activities, e.g. in connection with the sale of agricultural inputs, etc. So even within the group of private entrepreneurial advisors, there is organisational diversity. However, the private advisory segment is

characterised by some cross-cutting features, namely a relatively better service for clients on the one side (relatively fewer clients per agent, predominantly one-to-one advice), but significant structural challenges for advisory agents due to often small business forms or one-person enterprises on the other (Prager et al. 2016; Knierim et al. 2017). Against this background, there is a huge interest to better understand roles, tasks and agency of private entrepreneurial advisors within the AKIS and to study their interactions with other actors in their professional field and their interventions within the larger AKIS, in order to appreciate the functionality and performance of the subsystem.

1.2 Problem statement and objectives

An example of a pluralistic advisory system that was privatised early on, namely in the 1990s, is presented by the AKIS in the UK, more specifically in England. The characteristics can be summarised as follows (Curry et al. 2012; Prager and Thomson 2014):

- The British AKIS is a complex, open knowledge system with many different private sector, public, civil society and hybrid actors, which hardly experience any coordination, but interact in a 'laissez-faire' style;
- Politically and administratively, the four countries in the United Kingdom (England, Scotland, Wales and Northern Ireland) differ significantly in the organisation and administration of the AKIS actors, infrastructures and instruments, and NGO and hybrid actors are also partly only regionally active in each case;
- Particularly in England, since the 1990s, a commercialisation and privatisation of the previously state-funded and provided advisory activities can be observed;
- and due to multiple roles of private sector and civil society actors, it is extremely difficult to gain a qualitative and quantitative overview of AKIS actors and related functionalities.

Since this assessment, the AKIS in England and the UK has become both, more complex and fragmented. E.g. advisors increasingly receive funding from multiple sources and may be more and more confronted with conflicting roles and missions, e.g. promoting environmentally friendly and net zero measures while seeking to respond to farmers' profit interests (Ingram and Mills 2019). Equally there is a need for relevant knowledge across the sector to meet these new demands, in a recent AHDB sector consultation about constraint on UK agriculture, knowledge emerged as the most important factor (AHDB, not date). Summarising, there is no overall, updated picture of the AKIS in UK in general and more particularly of the AKIS in England. While features and characteristics may have undergone changes recently, the general trend of privatisation of services is ongoing and little is known in particular about the diversity of advisory service providing actors, their interplay for knowledge sharing and innovation support in times of important socio-economic and political changes for the agricultural sector, and the degree of effectiveness and efficiency in meeting their clients' demands, that they believe they can achieve (Ingram and Maye 2020).

With this report, a case study is presented to explore the AKIS in England, with a particular focus on the situation and development perspectives of independent private sector advisory service providers in the context of current economic and political trends. In summary, the objectives of the report are as follows

- a) to identify, by means of an overview diagnosis of the English AKIS, key actors that are crucial for farmers' access to relevant and up-to-date knowledge and sustainability innovations and,
- b) to focus in particular on private sector advisory professionals and services in order to close structural knowledge gaps;

- c) to highlight observed strengths and weaknesses of current actor constellations and
- d) to conclude on possible intervention options for key actors to support coordination and governance endeavours to improve the functioning of the AKIS.

To this end, a situation analysis of the AKIS was undertaken in the time from January to May 2024 with a special focus on the private sector advisory subsystem's position and performance based on grey and peer reviewed literature, expert and stakeholder interviews. The results of this situational analysis are summarised in the present document. The remainder of the report is structured as follows: section 2 briefly outlines the conceptual bases and section 3 the methodological approach of the AKIS diagnosis. Results in section 4 are structured into a short summary of literature (4.1) and of most recent policy developments (4.2), the graphical AKIS overview (4.3) and the presentation of detailed findings with respect to the features of the predominant actor groups (4.4). The result's section is concluded with selected cross-cutting findings (4.5) and in the last section, we discuss the findings and assess their contribution to the above presented research objectives.

2 Conceptual bases

The AKIS concept's strength is the consistent promotion of a systemic approach, so that constituent actors, network structures, communication and interaction relationships, coordination mechanisms and governance interventions can be mapped and evaluated with respect to their functionality and performance (Lamprinou et al. 2014; Hermans et al. 2015). Depending on the analytical focus, an AKIS diagnosis makes explicit and acknowledges the roles of individual and corporate actors for knowledge and innovation provision and dissemination, supports the study of knowledge governance and coordination dynamics at various intervention levels, targeting the agricultural sector as a whole or specific fields or branches, distinguishing aggregated subsystems only (e.g. research, education, advisory services, etc.) or types of actors according to their organisational forms, societal goals and functions etc. (Klerkx et al. 2012; Moschitz et al. 2015; Knierim and Birke 2023).

However, due to the manifold aspects that can be addressed with the help of the concept, a selection has to be made for the case presented here. Thus, in the following, we briefly highlight

- a) how the concept can be used to create a situational overview,
- b) how actor diversity and (sub) system pluralism is addressed and
- c) how interventions into the AKIS can be captured conceptually.

2.1 Use of visualised AKIS concept for overview appraisal

Several models can be used to functionally structure an AKIS, e.g. the subsystem model (Rivera et al. 2005) or the AIS model proposed by FAO (TAP 2013). While with the subsystem model, we distinguish 5 categories, namely 'users (producers), research, education, extension and support systems', the TAP / FAO model is divided into 4 categories, which are 'research and education, bridging institutions or intermediaries, business and enterprises of the agri-food system and the enabling environment'. Another structural perspective is offered by the EU SCAR AKIS model, which operates on a less abstract level and differentiates actor groups according to roles and tasks along the value chain and in research, extension and education (EU SCAR AKIS 2012).

In the context of this study, we use the AKIS diagnosis approach to create a visualised overview of an actual situation in terms of actor constellation. Thus, an AKIS graph groups actors according to (i) their main, formal roles and tasks (e.g. generation of scientific knowledge = academia, operationalisation and dissemination of knowledge = advisory service etc.) and (ii) to their legal and economic organisational character (public, private, civil society, for- and not-for-profit) and makes important linkages among them visible (Knierim and Birke 2023). The structured visualisation of the corporate AKIS actors, their assumed affiliations and their activities towards farmers are sketched in with the aim to allow for an easy capture of characteristic features for the exchange and discussion with AKIS stakeholders. All in all, this is a pragmatic application of the AKIS concept with potential to facilitate the identification of commonalities and differences in perceptions and judgements.

2.2 Actor diversity and (sub) system pluralism

In modern societies, manifold types of actors contribute to the generation, dissemination and the utilisation of knowledge and innovation, thus an organisational diversity in terms of legal and socio-economic forms can be observed in these AKISs. In addition, we use the term ‘pluralism’, when reference is made to the added value for users or the society that stems from interactions among heterogeneous corporate actors (Knierim et al. 2017).

The mentioned socio-economic characteristics of AKIS-related organisations come with assumptions about their aims and tasks within such systems: so, it is generally assumed that public bodies such as administrations, agencies and institutes pursue not only sectoral but also societal (= political) objectives, while private entrepreneurial bodies are considered to pursue for profit objectives primarily. Civil society bodies frequently operate on a not-for-profit basis and pursue often a combination of particular and public interests. A specific organisational feature is given by farmer membership organisations, wherein frequently coincide several roles and tasks related to the operationalisation, dissemination and the use of knowledge and innovation.

Taking such organisational information into account, further differentiation of the actor diversity and the roles they play for AKIS related objectives is possible, thus leading to an appraisal of the effectiveness of the pluralism within the AKIS or its subsystems.

2.3 Interventions within the AKIS

In this study, the term ‘intervention’ describes all kinds of means and measures that create linkages between corporate AKIS actors. Thus, interventions may be as well intentional relations among various actors (e.g. exchange of information or cooperation), as well as programmes, coordination mechanisms and devices which serve as means for communication and interaction (e.g. research programs, policy instruments, platforms, meeting agreements etc.) and usually come together with resources. Obviously, these interventions are manifold (with spatial and temporal heterogeneity), and while some of them are usually well documented and transparent to the public (e.g. publicly funded research programmes and policy instruments), other may only be known to the actors involved.

Coordination mechanisms are regulations and procedures that stimulate the exchange of information and the collaboration towards shared objectives among autonomous, independent respectively interdependent actors. They can be formalised through written agreements, laws and regulations or non-formal events such as conferences, workshops and similar networking events, and they can be supported by infrastructures such as platform technologies, a particularly established, supportive office etc.

With respect to linkages among AKIS corporate actors, we can differentiate between uni- and bi-directional ones, while also assuming that all linkages are formal ones. Uni-directional ones are considered to be top-down, determined by hierarchically integrated structures as e.g. from a ministry to a subordinated administrative or research body.

While the term ‘linkage’ does not reveal the quality of the relation, the term ‘interaction’ is more determined in this regard as it implies that there is mutually relevant, sequenced communication. This latter case is considered to be characteristic for human interaction, so that in this case we do not (only) consider formally established interaction schemes but also formal, non-formal and informal ways of communication and exchange. Similarly, the intensity and the frequency of interactions can be described and their quality can be captured in terms of the character of the relation (cf. table 1). This of course cannot be comprehensively done for the AKIS analysis presented here, but attempts will be made to characterise selected linkages.

Table 1: Characteristics of linkages in the AKIS

Directionality	Uni-directional	Bi-directional	Multi-directional
Formality	Formal	Non-formal	Informal
Intensity	Weak	Average	Strong
Frequency	Irregular, occasional	Regular	
Relation	Competitive	Neutral	Cooperative

2.4 The ‘well-functioning’ AKIS

Finally, to assess an AKIS at a certain moment and within a particular context, we use the idea of a ‘well-functioning’ AKIS. Thereby, we understand a situation where farmers and other actors of the agricultural sector or the wider agricultural – food system have access to relevant and reliable knowledge in a way that they can operate their business as to reach their own objectives and simultaneously to accommodate with societal aims that refer to the use and the protection of public goods.

Instrumental for a well-functioning AKIS are strong actors and interventions that are effective for coordination and cooperation among diverse actors thus allowing for the integration of interests and the generation of added value through cooperation.

In turn, if the AKIS is characterised by a clear presence of weak actors which means those with few resources, a limited scope of agency and highly particularised interests and / or when integrative mechanisms and coordinating interventions are missing so that there is a high degree of fragmentation, then the risk that farmers are not well-served is relatively higher and the AKIS functioning is considered as low.

This admittedly simplified categorisation will be used to discuss and assess the studied AKIS situation in England in spring 2024.

3 Methodology

The study started with the design of the proposal in autumn 2023, the field research was conducted during 9 weeks between mid-January and mid-April, 2024 and the analysis and finalisation of the report covered the period from May to July 2024. Methodologically, the case study used the AKIS

diagnosis approach (Knierim and Birke 2023), which was structured into three phases, (i) the familiarisation with the background and preparation of the field study, (ii) the implementation of the empirical field work and (iii) the analysis of the data, the presentation and discussion of results and the writing of the report.

The familiarisation with the research field took place in January and February 2024 and comprised the review of literature, reports and grey literature that were not available beforehand, the presentation and discussion and concretisation of the research design with the host partner and colleagues, as well as the identification of potential interview partners. On the basis of nine expert talks with members from the host organisation and from the Royal Agricultural University, a draft sketch of the AKIS in England and related interview guidelines were developed and tested. It was decided to largely focus on the advisory subsystem (rather than research and policy subsystem). Ethical approval of the research design was obtained in February 2024 from the CCRI ethics lead.

The implementation of the field work took place in March and April 2024 in the form of online or telephone interviews of 45 – 60 minutes duration¹. Interviewees had been identified from websites or recommended during the expert talks, were contacted via e-mail and informed about the study objectives and conditions. In total, 12 interviews with 15 people from a wide array of AKIS organisations were conducted (cf. table 2), which followed the guidelines and invited interviewees to comment on the AKIS graph.

Table 2: Overview of interview partners

Interview partner from organisation:	Organisational characteristics	Total number of interviewees
Natural England	Public sector, gov admin	1
ADAS, Hutchinsons, Strutt&Parker	Non-public, for profit	4
GWCT, IfA, Soil Ass	Non-public, NGO	4
NFFN	Non-public, farmer-based	1
AHDB	Public, farmer-based (by levy)	2
Basis, SFN, SRUC	Research & Educ / hybrid	3

Notes were taken from the interviews and subsequently, a protocol was drawn up (based on the characteristics of AKIS described in section 2) as well as comments integrated on the AKIS graph. Through this, the AKIS analysis was stepwise expanded, and the graph was continuously cross-checked, improved and refined. During this time, findings were repeated shared and discussed with the host partner.

The analysis of the interview data started in the second half of March in order to substantiate a first presentation of results in the host organisation before my leave as a guest researcher. However, the bulk of the analysis was done in the months May to July 2024 and consisted in an in-depth review of the interviews, the (grey) literature excerpts and the cross-check and refinement of the graphical representation. The final version of the report profited from the feedbacks gained from CCRI members and the exchange among authors.

¹ The interview guideline can be obtained from the first author.

The analysis of the data followed the categories presented in section 2 (users (producers), research, education, extension and support systems) and aimed at responding to the research objectives as presented in section 1.2. Although, the objective can be considered largely as achieved (cf. section 4 and 5), it should nevertheless be emphasised that the limited time resources allowed a broad but only selectively deep insight into the situation of the AKIS. In addition, the information presented here is essentially taken from available reports and the selection of interviewees, whose participation depended on their availability and willingness to talk, which was not always easy to obtain. This constellation means that the results in this report represent a broad but by no means representative selection of perspectives, statements and opinions. Voices from important AKIS actors as e.g. from farmer unions (NFU, CLA, TFA) or from DEFRA could not be gained. Nor was it possible to talk to representatives of the supply chain, the water industry and the veterinary profession, all of whom play an increasingly important role in the AKIS in UK. And, the aggregated findings likely contain subjective components that are difficult to address and may not have been averaged out. Consequently, we present the information on the AKIS in England as a set of AKIS components, that we could structure and compose on the basis of the available data. Based on the information gained through the interviews, we highlight particular features therein, rather than presenting the AKIS in England as integrated overall situation. All in all, results presented here shall be understood as another snapshot in time which hopefully adds to our understanding of ongoing organisational and institutional change in the agricultural sector.

For pragmatic reasons, the cited sources are identified in two ways: the cited journal articles and authorized reports appear in the literature list at the end of the report, the websites visited are referenced in footnotes.

4 Results

4.1 The AKIS in England in literature and reports

A number of publications, more reports than articles, have characterised the AKIS in England over the last decades, e.g.

- On the UK agri-environmental knowledge system and particularly on changes after the McSharry Reform of the CAP (Winter 1995; Winter et al. 2001),
- On the AKIS and knowledge networks for sustainable agriculture in England (Curry et al. 2012),
- A review of selected instruments and schemes for advisory services in England (DEFRA 2013) and
- An overview report on the AKIS in the UK with an advisory service focus (Prager and Thomson 2014).

Summarising some recurring observations and findings, we see that

- Authors repeatedly confirm that fragmentation and lack of coordination are key characteristics of the AKIS,
- public advisory services are increasingly oriented towards environmental aspects of agriculture,
- although non-public advisory organisations, both for profit and not-for profit organisations, are widely known and their number seems to increase, no systematic studies exist, and
- more generally, there is no overview update published on the AKIS in England in the past 9 years.

A graphical representation of the AKIS in England is missing, while a summative graph for the AKIS in UK has been proposed Prager and Thomson (2014) (cf. fig. 1). Also, a graphical presentation of the English research subsystem, particularly the aggregation of research institutes is available (Curry et al. 2012:244), which covers the period from 1979 to 2009.

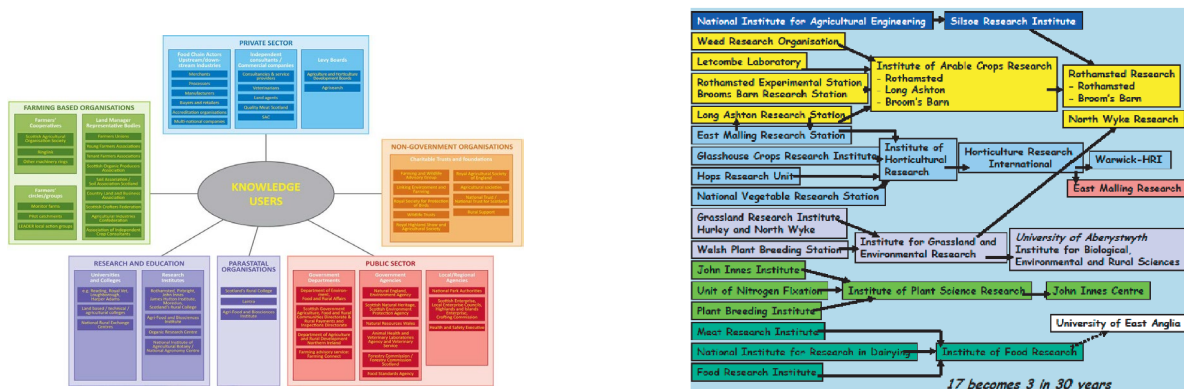


Fig. 1: AKIS visualisation (Prager and Thomson 2014:13); Research institute contraction (Curry et al. 2012:244)

A study of the Impact of Covid-19 on Knowledge Exchange employed a rapid appraisal of the AKIS (Survey, Interviews & Workshop Reports) also identified the scope of actors involved in the AKIS in England, farmer demands and the implications of the increase in use of digital tools (Ingram et al., 2021).

4.2 Recent policy developments

While the role of the AKIS for sustainable agriculture has become an explicit topic in the European Common Agricultural Policy (CAP), and its strengthening is pursued to foster strategic sectoral objectives, this is not the case in England. Recent policy developments address the effects and impacts of Brexit for the sector, the reduction and replacing of direct payments (known as 'basic payment scheme' or BPS) to farmers, with the 'ELMS based on 'public money for public goods', the restructuration and additional set-up of environmental and landscape protection and recovery schemes, and a turn towards 'net-zero' farming measures and acknowledging instruments. Additionally, funds have been and further will be made available that nourish innovation initiatives in the sector. The government has summarised these policies in the 'transition plan' (DEFRA 2020) and updated it recently (DEFRA 2024). More details about recent policies that matter for the AKIS are presented in section 4.3.2.

Whilst the focus of public policies and funding has continued towards more environmental concerns, net zero commitments and innovation incentives, Brexit represented a considerable disruption. The focus emphasis on public goods and loss of BPS heralded real concerns about the impact on farming communities which needed to be urgently addressed.

It is also important to highlight the role of private sector where there are equally influential organisations. For example, organisations in the supply chain like food retailers who implement food assurance schemes and water companies do a lot of work in knowledge production and exchange often in partnership with the advisory community.

4.3 Overview of the AKIS in England

Based on the desk study, making use of mostly grey literature, reports and statistical data that were available online and, informed by expert talks from within the host organisation (CCRI) and from the Royal Agricultural University (RAU), a first AKIS overview was drafted and visualised. This scheme served as basis and illustration for the interviews with AKIS stakeholders and was gradually complemented, refined and restructured (Fig 2).

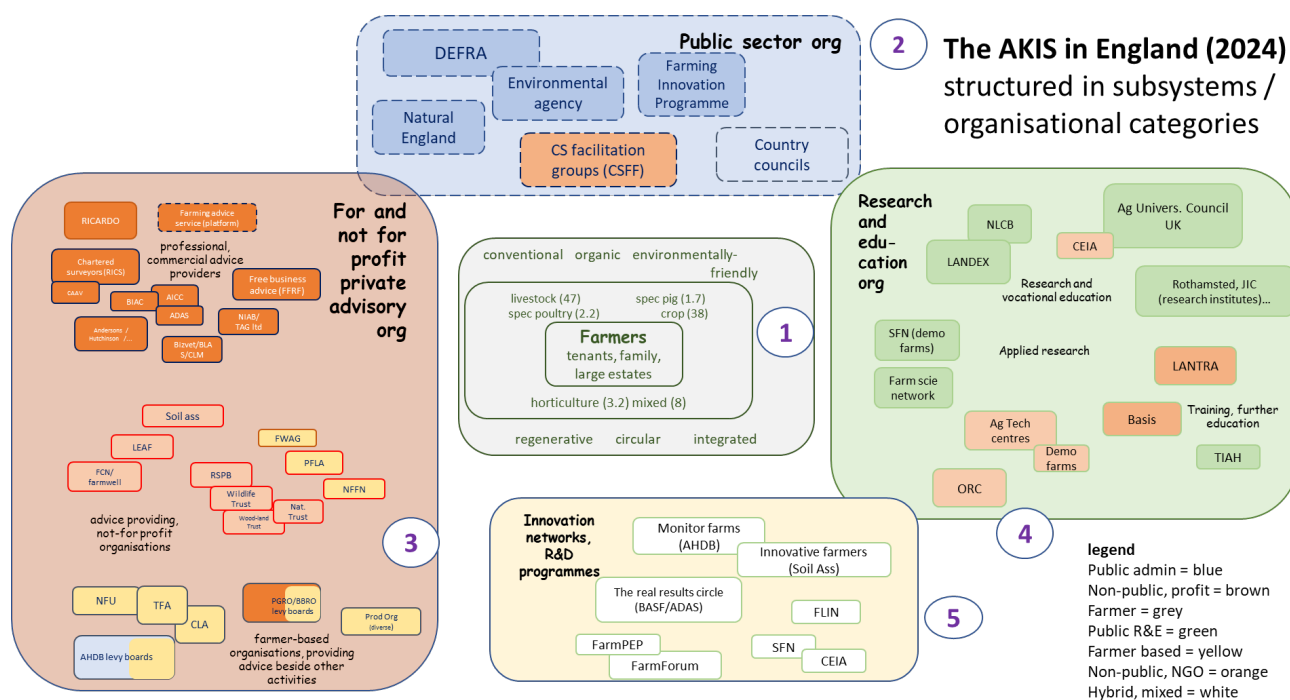


Fig. 2: Overview of the AKIS in England as of spring 2024

The scheme presented here proposes an aggregated overview that groups the corporate actors into (1) farmers, (2) public sector authorities, (3) private or non-public advisory service actors, (4) research and education bodies and (5) emerging hybrid innovation network actors. The grouping was done along several distinctions: (a) the public/private divide (n°2 and 4/n°1 and 3) and (b) the functional subsystems' divide between roughly the knowledge users (n°1), knowledge generators (n°4 and 5), and the knowledge intermediaries (n°2, 3 and 5), including obviously some overlaps. Further differentiations within the groups come with the organisational categories, e.g. within the group of non-public advisory organisations, the for profit and not for profit organisations can be distinguished (n°3, dark and light orange and yellow). While the groups n° 1 – 4 are well established in the literature, the data we collected led us to introduce the group of 'innovation networks' as a new group, which will be further explained in section 4.4.7.

Although we consider the proposed grouping as meaningful, it has nevertheless to be considered that it is not consistent in any aspect, as some of the actors have double features (e.g. farmer-led and for-profit or research and advisory providing etc.) and cannot be unmistakably attributed to one group or category only. Also, farmers are not a uniform group, and while we address them largely as a very heterogenous group of knowledge and innovation users in the first place (n° 1), they are equally present as knowledge intermediaries (n° 3) and engaged in the generation and the sharing of knowledge and innovations in networks (n°5).

4.4 The diversity of AKIS actors

The diversity of AKIS actors is presented in 8 sections: we start with the farmers (4.3.1) as intended users and beneficiaries of all knowledge and innovation activities. Secondly, in the big group of advisory service providing actors, we differentiate those from the public sector (4.3.2) and the non-public actors. The group non-public advisory services providing actors can be further grouped into (i) private commercial ones (4.3.3), (ii) private non-governmental or charity organisations (4.3.4) and (iii) farmer-based advisory organisations (4.3.5). The remaining studied AKIS actors are grouped into research and

education bodies (4.3.6), and innovation networks, driven by or centred around farmers (4.3.7). For completeness, we mention that certain types of actors have not been addressed in this study like e.g. agricultural media or financial institutes.

4.4.1 Farmers as users of knowledge

With this paragraph, we introduce the group of farmers as primary users, intended destinations and beneficiaries of AKIS activities. However, farmers are not a uniform group and can by no means be understood with a ‘one-fits-all’ set of characteristics. The manifold differences may stem from a variation of social, tenure and professional features, being e.g. member of a farming family, individual manager, tenant or owner of a farm, member of farming corporation, a farm worker, contractor etc. These professional features come with personal characteristics such as gender, age, education, and farm characteristics, as e.g. geographical local, sector, production type(s) and farming system orientation which matter for farmers’ interests of accessing and engaging with information, advisory and innovation support services (cf figure 3). In the following, we attempt to differentiate farmers along such personal and professional characteristics, while we do not refer to them as members of professional associations, as e.g. farmers’ unions (NFU, CLA, TFA), breeder organisations the one of mandatory character for farmers producing particular market products (AHDB). These organisations, although representing general or particular farmer interests, have specific aims and tasks regarding knowledge exchange (KE), advisory services and innovation support, and will be presented in the section 4.4.5.

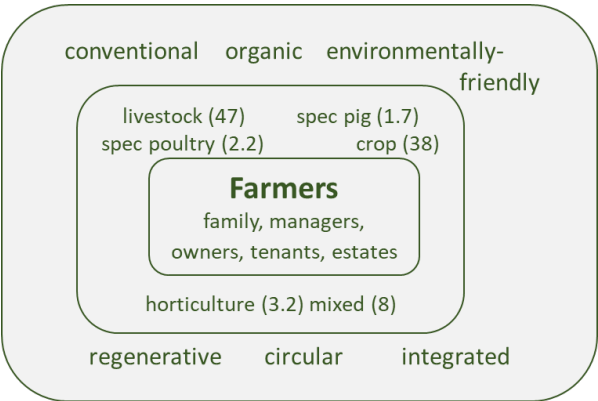


Fig 3: Differentiation of farmers according to socio-organisational, production-related and farming-system related characteristics

For context, in the following, farmers in England are characterised with the help of selected statistical data (DEFRA 2022):

- there is a total of 104.500 farm holdings in England; with respect to land titles, it is stated that roughly 90.000 farms are operated on ‘own’ properties, and roughly 39.000 farms on rented land, which in turn results in 15.000 farms operating on rented land only;
- information on farm size classes is specific about small and medium farm size while there is no differentiation given to the farms larger than 100ha, which make up 25% of all farms and work on 75% of the agricultural area;
- The average farm size is 87 ha with a certain variation in farm numbers and size among the 8 regions: e.g. North East has the smallest (4260) and South West the largest number (25.500) of farms, and the average farm size is highest in in North East and Eastern with 146 and 123 ha respectively, and lowest in South West and in the West Midlands with 69 and 66ha;

- Roughly 40.000 farms are classified as cropping and cereal farms, there are 3.400 horticultural and roughly 52.000 livestock (pig, poultry, dairy, cattle low- and uplands) farms and the rest either mixed or unclassified ones (8.000);
- There is a huge diversity of farming systems flagged, e.g. organic, regenerative, conventional, circular, integrated farm practices, but only the number of organic farmers can be quantified, i.e. 4100 (DEFRA 2022); ²
- Finally, there is information on farmers' education, although considerably less recent, stipulating that roughly 1/3 has basic or full professional agricultural education while almost 2/3 have obtained their knowledge and skills through practice (DEFRA 2016).

Obviously, these figures show a considerable regional variety in farm size, a recognisable relevance of livestock farming, and they may imply a rather low level of formal professional education among farmers. Furthermore, it is regrettable that the statistics do not show any further differentiation of the size class of farms over 100 ha, which makes up a group that is responsible for the use of 3/4 of the agricultural area in England.

As a main concern in this study is whether and how all or particular groups of farmers get access to information, advisory services and innovation support, it can be stated that such information is currently not available from statistical data. Obviously, the above-mentioned degree of professional education of farm managers would be a sobering proxy indicator for farmers' interest in new knowledge and the use of advisory services, - a correlation that is made by some literature reports between farmers' education level and their use of advisory services (Herrera et al. 2019).

Further insights into this topic can be gained from two studies published by AHDB. In their report on 'Innovation in Knowledge Exchange', Matthews and Bolton (2016:176) quote a Farmers Weekly study from 2015 on farmers' preferred sources of information. The representatively conducted study with a response from 478 farm managers across the UK, revealed that 88% make regular use of farming publications and 60% of farm advice, 57% indicate agricultural shows and 45% mention websites and direct mails in this regard. Furthermore, 44% consider farming publications as their preferred source of information, and 25% of the managers see farm advice in this place. The authors also report on an AHDB led survey across levy-payers on similar questions, which resulted in slightly varying results depending on the farming sector or production branch (table 3).

Table 3: The top three preferred methods of accessing information by production branch

Beef & Lamb	Dairy	Pork	Cereals & Oilseeds	Horticulture	Potatoes
Press	Press	Vets	Nutritionist/ Agronomist	Nutritionist/ Agronomist	Nutritionist/ Agronomist
Other producers	Events/Shows	Press	Press	Other producers	Press
Events/Shows	Other producers	Other producers	Other producers Meetings	Internet	Meetings

Source: Matthews and Bolton 2016:17

Thus, in the cases of beef, lamb and dairy producers farming press is on first position, while in the case of crops and potatoes, press comes second and advisory specialists are on the first place. Remarkable

² Number of organic farmers in England: 4.100 with 1300 in the South West and roughly 1000 in the South East regions (DEFRA 2022, statistics); all tables also available with the first author.

also, that ‘other producers’ are mentioned as important by 5 out of the six branches. This supports a widely held assumption about sectoral differences, that arable farmers normally access advice from an agronomist while livestock farmers look towards vets, breeder organisations, producer groups and other sources.

The second, more recent study was done as an evaluation of roughly 1700 farm business reviews from AHDB clients conducted in all regions of England. The report showed that across all farm types, the use of advisory services is widely spread, and more specifically, 73% of dairy farmers, 72% of mixed farmers and 71% of cereal farmers consider ‘accessing advise’ as their relevant management tool. Interestingly, this data also points to small differences among the land ownership groups, with 75% of all tenants, 73% of managers with mixed ownership status’ land and 68% of own-land farmers making preferably use of advice (Hurford and Baker 2022).

Considering these figures, their sources and the time of their collection, we propose as a plausible estimation that approximatively 50% of all farmers in England make use of advisory services, with half or more of them attributing to advisory services a high importance for their management decisions. Complementary, it is worth estimating how many farmers may not access advisory services, the so-called ‘hard-to-reach’ farmers. A recent study points to the difficulties to characterise this group and to capture its importance in figures. Thus, the experts interviewed by Hurley et al. (2020:10) varied considerably in their estimation of these ‘hard-to-reach’ farmers, namely between 5 and 70% with no common direction at all.³ The authors emphasised the large range of factors that may prevent farmers from engaging with information and knowledge exchange services and argued that according to their various personal and structural dispositions, particular types of farmers may be easily overseen by advisory agents.

Summarising, we see from these figures an important diversity among farms and consequently, derive a considerable diversity of related professional interests among farm managers in England with corresponding expectations and demands on the AKIS. Secondly, statistical data about farm characteristics is unevenly available depending on farm size classes with remarkable blind spots on farms with 100ha and more, which matter most for agricultural land use and can be assumed to be – very broadly – the more future prone and knowledge and innovation-oriented ones. However, this assumption comes with uncertainties and should be more systematically explored.

4.4.2 Public Advisory service providing actors

The prominent public actor in the English AKIS is the governmental Department for Environment, Food and Rural Affairs (DEFRA) with a range of subordinated, so-called arms-lengths bodies (DEFRA 2024a⁴). Among these bodies, those widely engaged in information spreading, knowledge exchange and innovation support for voluntary change in farming practices are relevant for this study. Generally, DEFRA operates at the national respective England-wide level, while arms lengths bodies like ‘Environment Agency’ and ‘Natural England’ have regional centres with advisory and administrative staff (EA 2024⁵). Decentralised government structures, which address agricultural land use and farming practices are not institutionalised at regional or county level, with the exception of national parks and

³ Actually, the data speaks for itself, the estimations being, one by one: <5%; 5%; 10-12%; 20%; 33.3%; 40%; 50%; 60%; 60-70%; 70% (Hurley et al. 2020:10).

⁴ Website with list of organisations: <https://www.gov.uk/government/organisations>

⁵ Website EA organisational structure (10/2024)

<https://assets.publishing.service.gov.uk/media/667ea4ca4ae39c5e45fe4da6/EA-Org-Chart-June-2024.pdf>

areas of national beauty (ANOBs) and Catchment Sensitive Farming. Lastly, there are county-level bodies called 'local nature partnerships' (LNP), a kind of mixed commission responsible to advance nature conservation measures, and although regulatory institutionalised, they have a multi-actor governance organisation with no explicit public commitment, and their voluntary measures may address land use and agri-environment schemes, while not systematically intervening for the change of agricultural practices. LNP exist since 2011 and, their impact for agricultural land use varies considerably. In some cases, there is a strong engagement, e.g. county-level public intervention for agricultural information and advice is possible, as can be observed in Devon⁶.

DEFRA is the governmental body, that provides research, agricultural policies, laws and regulations, and finances measures, which beside others also comprise information dissemination, advisory services and support to innovations in agriculture. In the following, a selection of ongoing policy measures is briefly presented, encompassing further responsible actors involved and – when available – figures on the measures' implementation in early 2024.

- A certain amount of free farm business advisory services is offered to all farmers in England. Funding is obtained from the *Future Farming Resilience Fund*, a specific programme set up post Brexit, which combines public funding with private distribution by an international company to recognised members of advisory organisations that were selected beforehand for this kind of services (DEFRA 2024). At county level, there is a range of organisations from which farmers can chose (e.g. in Gloucestershire, advisors from 17 different companies and bodies listed⁷). According to DEFRA, 18.000 farmers have been served in the frame of this scheme since its start. This figure corresponds to roughly 18% of the English farmers.

Then, there is a number of agri-environmental and landscape protection related schemes that come in combination with advisory services and are implemented directly or indirectly by the Environmental Agency (EA) or Natural England (NE). These are

- the CSF (Catchment Sensitive Farming) programme which started in 2005, and since then, involved almost 20.000 farms with 34% of the agricultural area in England; it is supervised by EA and implemented by Natural England through CSF Officers. With respect to CSF related advise, an interim evaluation states that "using an effective mix of one-to-one and group engagements, significant importance has been placed on building relationships across the farming community. Overall, farmers are very positive about their experiences of CSF and indicate CSF Officers provide them with relevant and trusted advice." CSF is a spatially specific programme, targeting selected catchments vulnerable to diffuse pollution and flood prevention (EA 2019);
- the 'Countryside Stewardship (CS) Facilitation Fund' which supports a diversity of agri-environmental measures with more than field-level focus, implemented by self-organising, facilitated farmer groups (DEFRA). There is written evidence of 136 groups with roughly 3000

⁶ Website free farming advice programme Devon; <https://www.devon.gov.uk/news/free-agricultural-transition-workshops-for-farmers-and-landowners/>

⁷ ADAS, Berrys, Brown & Co, Ceres Rural LLP, Devon County Council, DJM Consulting, GSC Grays Ltd , JH Agri Consultancy, Laurence Gould Partnership , Matt Hague Agri-business , Natural Enterprise , NIAB , Promar International , Ricardo-AEA Ltd , Soil Association , The Royal Countryside Fund (RCF) , Wilson Wraight

farmers (Short et al. 2022) and, according to communication of an NE member, in the meantime already 6200 farmers are involved within 220 groups. Facilitators may come from various organisations, such as Wildlife Trust, National Trust and other charities, as well as from private independent for-profit companies, and even farmers themselves may work as a facilitator. Such facilitation groups, in some cases called 'farm clusters', classically elaborate and orient on CS targets of awareness creation and measures on landscape-level issues; today, additional focus is on net-zero practices and on farmers' wellbeing. Facilitation groups are effective when they bring beneficial input to the farm business, they are appreciated for e.g. organising events that combine attractive business information with environmental topics etc., for which purpose e.g. experts from the AHDB or independent consultancies may be invited. Apparently, there is no formalised exchange among or organisation of the facilitators (only one meeting in 2015) which makes them lone fighters with successful facilitation group work highly depending on individuals' skills and the expertise.

- Looking ahead, the government intends to broaden the application of agri-environmental or environmental landuse measures (AEMS or ELM) through the increase of payments for 'Sustainable Farming Incentives' (SFI) (1st tier) and 'Countryside Stewardship' (CS) measures (2nd tier) and, to ease application by merging them into one procedure and through the establishment of the 'Landscape Recovery Programme' which aims at regional-level initiative of environment-friendly farming. Usually, the implementation of these schemes comes together with advisory services, and currently, 39.000 farmers practice such SFI and CS AEMS, and 22 LR projects have been implemented (DEFRA 2023⁸). These figures make it probable that at least 40% of all farmers have made use of advisory services in the context of agri-environmental farming practices. Several interview partners indicated that DEFRA is developing a new, long-term scheme for environmental recovery, which builds upon the experiences with the facilitated CS groups. Apparently, such an approach would imply (more) regional collaboration among farmers, demanding for large group facilitation, negotiations and consensus finding procedures supported by third-party facilitation.

Another regionally specific measure is the 'Farming in Protected landscapes' programme (FiPL). It is open to farmers in National Parks (10), ANOBs (34) and the Broads. Its aim is to spread measures that benefit protected areas and it gives access to financial means that support nature recovery, mitigate the impacts of climate change, provide opportunities for people to discover, enjoy and understand the landscape and its cultural heritage and to protect or improve the quality and character of the landscape or place. The programme runs from 2021 to 2025 and has a budget of £100 million. An interim evaluation among participants revealed a very high satisfaction and strengths such as (i) a highly dedicated, well informed programme staff (protected landscape officers, PLOs, public agents), (ii) the flexibility of the programme to respond to local needs, and its thematic breadth and (iii) reliability of payments. It is also positively noted that the FiPL programme has fostered collaboration among farmers, between farmers and PLOs, among PLOs and that PLOs are in interactive exchange with the DEFRA FiPL team (Turner et al. 2023).

⁸ Website on DEFRA CS schemes: <https://defrafarming.blog.gov.uk/2023/04/12/countryside-stewardship-delivering-for-farmers-and-the-environment/>

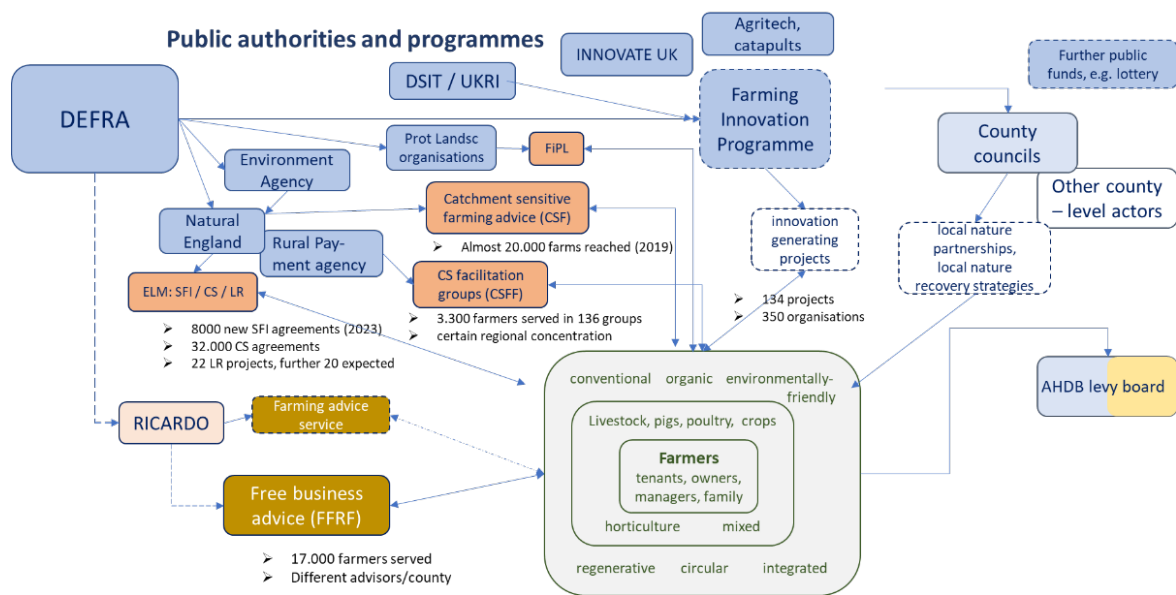


Fig 4: Scheme of advisory services that are funded and organised by the public sector

Last but not least, DEFRA together with DSIT and UKRI has installed the ‘Farming Innovation Programme’ which aims at developing and implementing innovations in robotics and automation, at furthering more environmentally sustainable pesticides and fertilisers and at the introduction of Artificial Intelligence tools to support animal health and welfare. The total funding of £270 million is structured into several sections, and the website reports that since 2021, competitions to the value of £136 million were launched with already 134 projects initiated, involving over 350 organisations. For 2024, a new scheme entitled ‘Accelerating Development of Practices and Technologies (ADOPT)’ will be set up with fund 3, with a particular focus on providing support to farmers to test and trial new technology and techniques on farms, potentially helping to reduce labour costs through innovations.

As visualised in Figure 4, DEFRA with its related national and regional bodies is directly and indirectly engaged in providing an impressive range of different advisory and innovation support services. Indirect provision is organised in cooperation with a broad range of public and non-public actors. These multiple parallel offers, particularly in the field of agri-environmental schemes and eco-system related services result in a lack of clarity with respect to public priority setting and coherence of instrumental approaches which may look confusing for farmers. It is thus not surprising, that schemes with a reliable public advisory service at local level, such as CSF and the FiPL programmes, have particularly good responses and adoption rates among farmers, while little is known e.g. about the free farm business advice’ relevance. Furthermore, there is no coordination or integration of knowledge provision visible and apparently, no synergies expected, no activities to enhance communication and exchange among advisory and innovation providing actors observable.

4.4.3 Non-public, for-profit advisory services

Private commercial organisations that offer information and advisory services to farmers in England are manifold. This type of organisations further differentiates according to (i) the degree of coupling of advisory services with value chain activities, as e.g. the selling of inputs or the purchase and processing of agricultural goods, (ii) the degree of serving farmers as sole clients or as one among

several professional groups and (iii) the contents of advisory services, e.g. whether it is primarily related to production and farming practices, agri-environmental concerns, farm business and management aspects, i.e. the focus and the breadth of advice.

There is no overview of non-public for-profit advisory providing actors in England. Prager and Thomson (2014) list more than 60 bodies for the whole UK, and Pressland (2024, pers. comm.) explicitly identified a dozen. In the following, we sketch a rough overview and then highlight a small number of organisations which were chosen because they (i) have a longstanding history as AKIS stakeholder, (ii) have a reputation as having a noticeable presence in the field and/or (iii) provided or were mentioned by interview partners.

The general picture (cf. Fig. 5) is that there is a significant number of private, entrepreneurial advisors on the ground, with structural differences among the fields of agronomic, livestock production and farm business related advice. While agronomic advice seems to be traditionally provided to more or less all crop producing farmers by independent crop consultants or those employed by input companies, farm business advice is offered by a broader diversity of professional organisations, including some who operate far beyond the ag sector, to a smaller share of farmers. One interview partner estimated this share at 25% roughly. In contrast, specialised livestock production seems to be to a large degree closely integrated with the processing industry where the provision of advice on production may be replaced by contractual agreements on how to produce. One interview partner estimated the level of 80%. Secondly, a bit similar to the agronomist advisors, veterinaries⁹ are widely recognised as influential actors on farm for livestock production because of their usually regular visits to farms, although they might not identify as advisors per se. This triple divide comes with consequences: while there is an umbrella organisation for independent agronomist advisors (AICC), umbrella organisations for farm business, upstream and downstream industries and management companies are either not focused on advisory services (AIC) or go far beyond farming and rural development (RICS). As for the livestock sector, no such umbrella organisations were observed, although sectoral organisations/trade associations are important in this respect (Fig. 5).

⁹ The British Veterinary Association (BVA) is the national representative body for the veterinary profession in the United Kingdom.

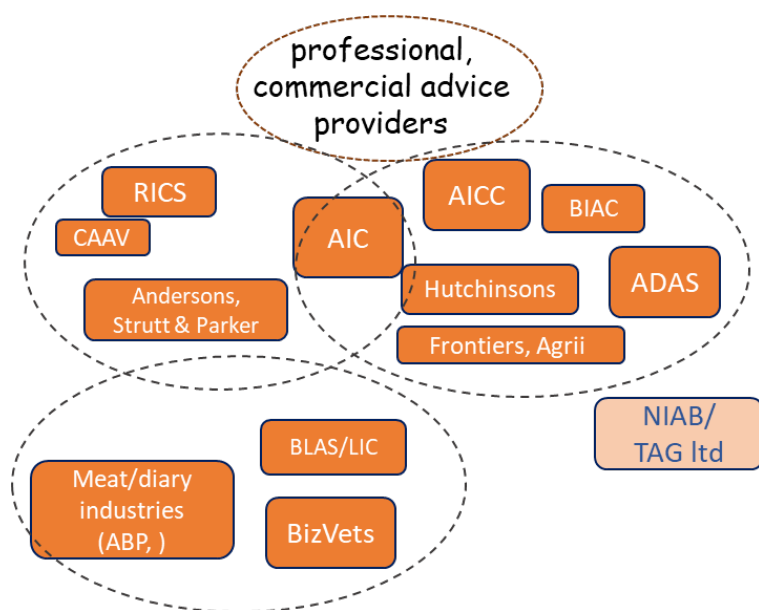


Fig 5: Non-public, for-profit advisory organisations, grouped according to fields of specialisation

So, we stress the organisational diversity of the for-profit advisory organisations with respect to their mission and mandate (prioritising advisory services, processing and sales, etc., being a business company, an umbrella organisation, freelance advisor etc.). Also, we see some interesting commonalities: more than 10 for-profit organisations have subcontracted with Ricardo (a consultancy contracted by Defra, cf. section 4.4.2) to provide free farm advice. Some of the for-profit organisations offer yearly conferences and/or produce outlook papers which serve as knowledge dissemination and sharing events for their members and are open beyond to the interested (and fee-paying) public (RICS, Andersons, BIAC etc.). During the talks another joint feature was that farmers ‘peer-to-peer’ learning is considered a widely shared concept for enhancing information and innovation spread, which is reflected in the fact that meanwhile, also supply chain actors have established farmer groups (e.g. PRISM by ABP¹⁰ or TESCO sustainable dairy group (TSDG) by TESCO¹¹ (cf section 4.4.7).

Detailed descriptions for a selection of organisations in this field

In the following, we present selected features of this group on the examples of ADAS, AICC, RICS, Strutt and Parker, AIC, Hutchinsons and NIAB. ADAS is one if not the prominent for-profit advisory organisation in England. Created as the national public agricultural advisory service (NAAS), and privatised in the 90s, the organisation exists now for more than 75 years. ADAS claims to be the largest independent advisory organisation on agricultural and environmental subjects in England and Wales, although today belonging to the internationally operating RSK group, whose headquarter are in Cheshire. Their staff comprises more than 400 advisors, working on 60 different subjects, including agronomic, horticultural and livestock production ones. Due to both their longevity as well as that they once offered free on-farm advice supported by experimental farms, they are very well known in the sector. A second reason for their popularity and impacts is their regional presence all over England.

¹⁰ <https://abpsustainabilitystory.com/on-the-farm/prism-2030/>

¹¹ <https://www.tescopl.com/sustainability/planet/farming-and-agriculture/tesco-sustainable-dairy-group>

However, although the indicated number of advisors is quite high, representatives of the organisations tended to move ADAS' position in the AKIS diagram towards the research and education subsystem, emphasising the organisation's strong research component and its shift away from individual farm advice. ADAS, through its trial facilities is well suited for commissioned studies for both and private bodies whereby results from the latter are retained internal. ADAS also initiates and conducts publicly funded innovation projects, in cooperation with farmers and/or other AKIS stakeholders. One example is the YEN (Yield Enhancement Network), which supports farmers to enhance crop production performance through KE and benchmarking activities (section 4.4.7) and runs for more than 10 years already, another more recent one is the FarmPEP (Performance, Enhancement, Partnerships) platform for knowledge exchange (cf. section 4.4.7) set up with a funding from Innovate UK (UK's national innovation agency which supports business innovation across all sectors, cf. section 4.4.6).

The Association of Independent Crop Consultants (AICC) is an umbrella organisation for independent agronomists who declare to provide unbiased advice and come with particular professional standards. AICC states that it provides 50% of all advisory services used by arable farmers and covers 2.2 million ha of agricultural land in the UK. The organisation runs an own AICC academy and field trials and has a regionally structured representation. In 2019, a total number of 264 members was reported (AICC 2019).

Another umbrella organisation with a longstanding tradition and frequent mention by experts is RICS, the Royal Institution of Chartered Surveyors. Members of RICS are specifically trained and certified advisors in the field of development and management of land, real estate, construction and infrastructure. Their activities in rural England encompass "(i) providing valuations for property and other asset types, (ii) offering expert advice on environmental issues and construction, (iii) measuring and collecting data on specific areas of land, including information about boundaries, buildings and features, both natural and man-made, (iv) providing an accurate report of the potential impact of any development or engineering works, and (v) making sure that the financial position of construction projects is accurately reported and controlled effectively". The strengths of RICS advisors lie in the warrant of (i) globally respected standards and (ii) the degree of recognised professional qualifications. However, the organisation's content focus is not explicitly directed towards agricultural production or farm management, so that the role and importance of RICS advisors for the AKIS remains difficult to estimate. According to the website, there are 62.000 chartered surveyors in the UK, from which 3.7% are employed in the rural sector¹², which corresponds to roughly 2300, so quite surely, several RICS land agents are present in every county.

Within RICS, there are member organisations that more explicitly engage in land and farm management advice. One example of such an organisation is Strutt and Parker, a UK Estate Agents & Property Consultant who maintains a particular 'rural hub' with 30-35 staff members devoted to farming and land management issues. Strutt and Parker is partner in the DEFRA funded NICRE (National Innovation Centre for Rural Enterprise) project which is an initiative (led by the University of Newcastle) to improve the entrepreneurial knowledge in rural areas and to strengthen labour force. According to one of their members, Strutt and Parker engages in the AKIS through two channels, one as a partner in rural research projects, targeting entrepreneurial knowledge and exchange, the other in broadening their agents' expertise on farming related contents and opening farm business topics towards environmental and climate change mitigation. Other UK-wide organisations include Savills,

¹² <https://www.growyourfuture.education/>

whilst smaller more regional companies and freelance agents are available providing farm management advice.

AIC, the Agricultural Industries Confederation, is equally an umbrella organisation, however with no direct advisory service orientation, being a lobbying organisation for their 230 members of up- and downstream industries of the agricultural sector. AIC was founded in 2003 through a merger and, as stated on their website, AIC works on behalf of its members by lobbying policymakers and stakeholders, delivering information, providing trade assurance schemes, and offering technical support. AIC integrates the full range of agricultural value chain actors and provides an internal organisation for the appraisal of new knowledge through subject matter committees. Adhering for-profit companies with advisory components, such as Hutchinsons and others, have direct gains from the assessment and the operationalisation of innovations and new insights that comes with these committees' work.

Hutchinsons is a private company, providing inputs, technologies and advice on various crops and agronomic management topics, and with 500 staff reaching to farmers on roughly 1 million ha farmland nationwide (UK), they consider themselves as the largest, family-owned advisory business in the sector. Agronomic advice provided on crop production is based on in-house expertise and, on research cooperations with e.g. Rothamsted Research and AHDB. Advisors also hold the certified qualifications from Basis. Hutchinsons works with 200 advisors, organised in regional teams composed of agronomists and further specialists e.g. on environmental topics, digitalisation etc., with a certain focus on arable farming regions in Eastern side of England. According to the interview partner, Hutchinsons respond to roughly 10.000 customers per year, 90% or more of them in England, with also most staff in England, and almost no activities in Wales. Further companies supplying inputs comprise large distributors such as Frontier, Agrii and others employing agronomists who support sales with advice on farm. Equally, large cooperatives and buying groups like Anglian farmers will also have representatives offering advice.

Similar to ADAS, although at a lower numeric level, NIAB can be seen as a hybrid body combining research and advisory services. NIAB has some reputation as an independent research organisation with a focus on crop studies; it was established in 1919 and has grown to a body with today more than 400 staff members, localised in Cambridge, in Kent and in further regional centres. NIAB is mentioned here because the organisation is also the owner of the TAG consulting Ltd, a private advisory company whose staff are specialised agronomists.

A further aspect of private sector advice is the role of supply chain actors with respect to setting up and facilitating farmer groups as mentioned above, as well as in governing retailer food assurance schemes (e.g. LEAF Marque) which are supported on farm by accredited advisers and intermediaries. Equally large companies like Arla which is farmer-owned (3000 in UK) run large programmes such as Growing Together which offers sustainability and net zero advice through workshops.

Summarising, the landscape of non-public, for-profit actors in England is very diverse with respect to professional specialisations, to their staff size and range of activities, and to their degree of engaging in publicly funded research and development projects. Overall, there is an impressive number of organisations and agents with varying degrees of engagement in knowledge exchange, advisory services and innovation support. A rough estimate by one of the interviewees gave a figure of 3000 - 10,000 agents for England, admittedly a very broad range, but whose lower edge fits in well with the

aggregated membership figures of RICS, CAAV, AICC and others mentioned above Overall advice through the supply chain is associated with both upstream and downstream activities.

4.4.4 Non-public, non-governmental associations and bodies

Among all advisory service providing bodies in England, there is a large group that constitutionally are non-governmental or charity organisations, with other words ‘not-for-profit’ bodies. Their shared characteristic is that they mobilise public and private funds to pursue specific sets of objectives and interests, frequently mixtures of public and private ones. Thus, the organisations can be considered as driven by shared societal interests, such as e.g. sustainability in general, or social, environmental, socio-ecological etc. in particular. Secondly, they tend to be membership organisations with individual civil society actors as dominant type of members, who share the overarching interests and organisational goals. Hence, members can, but must not be farmers, e.g. Here, we briefly look at some of the frequently mentioned advisory providing non-governmental bodies and, differentiate three groups: (i) those with mixed sustainability related objectives (Soil Association, LEAF and others), (ii) those with an explicit priority for environmental concerns (various trusts, RSPB) and (iii) farming-oriented, sometimes farmer-led bodies which promote particular approaches to farming (FWAG, GWCT, NFFN, others).

Although the number of these bodies is again impressively high, their size in terms of staff members or farmers reached and served is considerably lower than those of the prominent for-profit organisations, as will highlighted by the examples below.

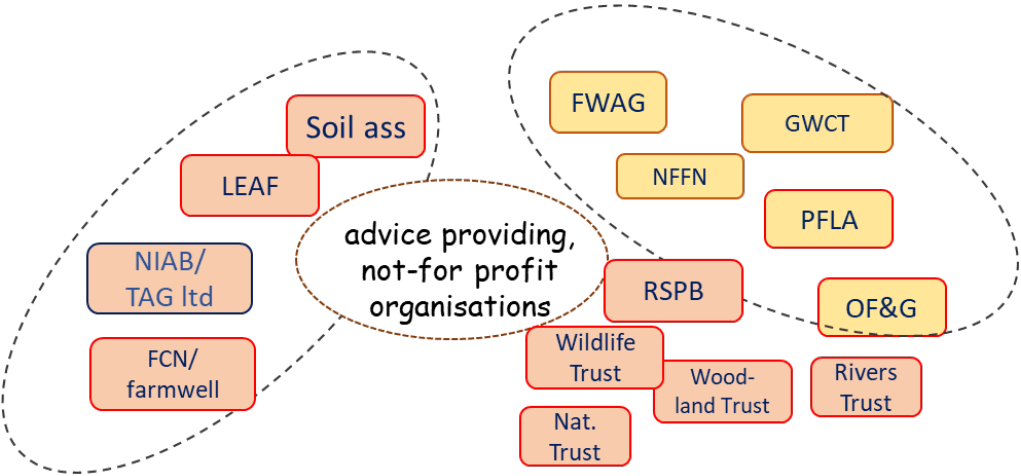


Fig. 6: non-public, not-for-profit advisory organisations

Detailed descriptions for a selection of organisations in this field

The Soil Association, founded in 1946, unites (organic) farmers and others actor, and its main aim is promoting sustainable agriculture and soil-caring farming practices. The organisation’s funding is obtained from donations, projects and service provision, with the overall organisation split into an NGO, which also owns a land trust, and a certification-providing limited company. On the website presence, no membership figures are reported, however a broad range of different activities in agriculture and food, in England, the UK and internationally reveal the vibrant engagement of the

organisation. Thus, it is declared that over the last 11 years, cooperation with over 750 farmers was realised through various programmes, in particular those realised with the 'Innovative Farmers network' in the form of field labs accessible to organic and non-organic farmers. Advisory activities are only a small component in the organisation's portfolio, with 3 from 8 advisors regionally split, and the others specialised in horticulture, agroforestry, soil care and providing support to the Innovative Farmers. Other components are the certification team, which operates completely separate, knowledge exchange (KE) activities in general, comprising the organisation of events, frequently associated with farm trials like e.g. the knowledge network around agroforestry and finally, the Innovative Farmers programme (cf section 4.4.7). Other KE activities comprise farm visits (15 per year), webinars, field labs with the latter growing so fast, that no overview how many farmers are reached exists (SA, pers. comm.). The particular importance of Soil Association within the English AKIS was expressed by a relatively high number of its mention by the interviewees.

LEAF, which means 'Linking Environment And Farming' is a UK-wide and globally actioning NGO, working with farmers, scientists and other people to contribute to a more sustainable food system and circular agriculture. LEAF was founded in 1991, thus, considerably 'younger' than e.g. Soil Association. LEAF had 1600 farmer members in 2010 (Mills et al. 2010) and no update of this figure was available. An evaluation of LEAF's impacts from 2010 reported that members experienced a) financial benefits such as reduced costs through savings on inputs and better compliance to regulations, b) increased income through adherence on the LEAF mark and access to agri-environmental measures etc; c) environmental benefits such as improved soil and biodiversity conditions on the farm and an increased awareness for it; and d) social impacts such as improved communication skills and interaction performance and a better understanding of the local community. An important activity of LEAF is the certification of farmers and growers with the LEAF Marque and the promotion of farm products among retailer partners. Further knowledge exchange related organisational structures are a network of LEAF innovation centres (implemented in collaboration with universities, colleges and others; thereof 12 in England) and a network of LEAF demonstration farms (roughly 30 in England); additionally, there is a LEAF education programme targeting young people, teachers and farmers. The role of the LEAF as a brand can be considered important as 45% of UK fruits and vegetables are grown on LEAF marque certified farm (according to their own figures).

Soil Association, LEAF and other bodies as e.g. the 'farming community network (FCN) integrate farmers' interests with societal objectives and concerns and support farmers' provision of a range of services coupled to or going beyond food production. Being individual membership organisations, they accept both farmers and other societal actors with various professional and private interests and unite them with a joint mission and common understandings, and by this, foster the exchange about and the integration of interdependent farming and societal concerns. Labelling and certification activities increase the visibility and the credibility of particular farming practices and in turn, allow such organisations a certain advocacy for (parts of) the sector.

A second important group of not-for-profit, non-public organisations with an agricultural advisory component is characterised by primarily targeting the respect of sustainable natural resource management, environmental concerns and biodiversity conservation in farming. Several of these organisations have a long to very long tradition as locally well-connected grass-root bodies, building on individual activists and interest groups, connected to environmental movements and to science. They are usually registered charities and may receive considerable private donations. Here we mention

cursorily the different trusts (Rivers Trust with its membership organisations, National Trust, Woodland Trust, Wildlife Trust, Game and Wildlife Conservation Trust etc.) and the Royal Society for the Protection of Birds (RSPB). Regional river trust organisations have become an important actor in the AKIS through their engagement in the 'Catchment Sensitive Farming' (CSF) programme for sustainable water management in agriculture (cf. section 4.4.2). RSPB offers targeted management advice for nature-friendly farming and the protection of birds and other wildlife through their Farm Wildlife programme. Another example in this group is the Game and Wildlife Conservation Trust (GWCT) who pursues the aim to increase game and wildlife in the countryside. Similar to regional river trusts, GWCT is involved in the CS facilitation fund activities since the beginning in 2015 and strongly supported landscape-level approaches. On their website, GWCT claims supporting roughly 120 farmer clusters (www.farmercluster.com), i.e. a huge number of groups of farmers that together pursue an environmental objective on their farm and at landscape scale, usually initiated by a lead farmer and supported by a facilitator, and most frequently supported with financial means from Natural England (NE). Currently, GWCT employs 10 advisors for the UK at a whole, with subject matter and regional specifications. Besides, GWCT hosts 'the Allerton Project' which is a research and demonstration farm to identify management practices that provide multiple positive outcomes to rural landscapes. It aims at sharing their research through advisory and educational work and offers both formal training, certified with Basis, and knowledge exchange and information activities to advisors, authority members, farmers and other AKIS stakeholders on wildlife and biodiversity conservation on farms (GWCT/AP, pers. comm).

Finally, the third group is characterised by organisations stemming from farmer-initiatives who created them to promote a particular way of farming from within the sector. One of these bodies is FWAG – the Farming And Wildlife Advisory Group, which exists for more than 50 years. According to their own description, consultancy on agri-environmental measures is given a strong focus, and the organisation supports farmer groups all over the country and runs an own farm advisory training programme. There are no national-level figures for FWAG activities openly available, but e.g. for FWAG South West, farm advice is offered on several topics, and it is claimed to have submitted 159 CS agreements in 2021, supporting AEM on 22,800 ha of land and mobilising approx. £11.5 million to farmers in the following 5 years¹³.

Although the organisations in this group have the common characteristic of being farmer-based and farmer-led with a focus on knowledge exchange and service provision, they may vary considerably in their aims and activities. E.g. the Nature Friendly Farming Network (NFFN) is with roughly 7 years a relatively recent organisation, pursuing several aims such as increasing farmers' voice in the public, in media and politics, supporting peer-to-peer learning among farmers and creating and fostering particular networks and cooperation around more sustainable ways of farming¹⁴. With their regular reports, they also provide practical management advice for farming that puts nature and climate first. NFFN consists of a team of 17 people among which are farmers, while supporters to the network are mostly charity organisations with an environmental focus, including the many trusts, the soil association, the FWAG, and some of the organic agriculture certifiers. The organisation's typical services and successful activities comprise the conduct of all kinds of farmer events to which experts from other organisations are invited. Currently, roughly 2000 farmers have signed in as members in

¹³ <https://www.fwagsw.org.uk/>

¹⁴ <https://www.nffn.org.uk/>

England, and with social media, the organisation claims to reach 30 – 40.000 people (NFFN, pers. comm.)

The ‘Pasture-fed Livestock Association’ (PFLA) is another example for the huge diversity of not-for-profit organisations funded and co-directed by farmers and other agricultural actors. PFLA aims at livestock production exclusively based on pastures, regenerative farming and the integration of a high quality value chain by uniting farmers, butchers, retailers and consumers within one organisation. PFLA offers the ‘pasture for life’ certification, and provides information, networking and advisory services to their members¹⁵.

Finally, with RASE (Royal Society of Agriculture of England) and IfA, we mention a set of organisations that represent an almost 200-years long tradition of linking science and practice in agriculture in combination with regional activities for knowledge sharing and innovation dissemination. Thus, IfA is a knowledge exchange charity, which was funded in 2013 as ‘the delivery branch of the RASE’. IfA consists of a team of 12 people roughly, and is reaching farmers through shows, exhibitions and other public events that are organised in collaboration with a huge range of partners from the AKIS. A particular relation exists with the 17 different county-level societies of agriculture, where a considerable number of farmers and other rural actors can be reached. Besides these various regional shows, today the national Groundswell fair is considered to be the most important show for regenerative agriculture (IfA, pers comm), whilst CEREALS and LAMDA have prominence in the conventional agriculture. IfA supports innovative farmer group events and others with facilitation services, collaborates with organisations such as AHDB, NFFN, the various Trusts, and is also active in networking and project participation at the European level.

Summarising, the non-public, not-for profit group of advisory organisations is characterised by its huge diversity of organisational features, its different groundings in societal compartments, which offers options for specific alliances, and a varying degree of engagement in advisory service provision. Many activities of these bodies have a local or regional focus and a project character, which means that they are limited in time, pioneering with respect to new ideas and approaches but at risk of a lack of institutional support, and thus their wider impact may be limited.

4.3.5 Farmer-based associations

In this section, we present farmer-levy and farmer member organisations that predominantly serve farmers’ interests. On first position we highlight AHDB which has a strong presence in literature and was the most frequently body mentioned as important AKIS actor. In line with AHDB’s primary vocation, we mention other producer organisations and thirdly come to farmers’ unions and associations as actors with political representation interests. These membership and representation features, with no or a low advisory component, distinguish them from the farmer-oriented advisory bodies mentioned in the previous section. We made the difference along the small line where organisations prioritise knowledge exchange activities against representation of professional interests although we know that both types of bodies incorporate the both types of activities.

¹⁵ <https://www.pastureforlife.org/about-us/our-staff/>

Detailed descriptions for a selection of organisations in this field

AHDB, the Agriculture and Horticulture Development Board, is an 'arm-lengths', non-departmental DEFRA body from its statutory nature (AHDB accountability report 22/23), however through its essential funding as a levy board (that is farmer funded), which includes all agricultural actors selling a certain range of products, it is considered as driven by the sector and serves the interests of farmers. Main activities of AHDB are the collection and dissemination of information, the conduct of research and the support to knowledge exchange of their members. Beside a comprehensive national team, AHDB has also decentralised structures for 7 regions in England, with 5 – 7 staff members each, all having a profile as knowledge exchange managers on particular subject matters. AHDB has been mentioned as an important AKIS actor by many interviewees, although in the recent past, the organisation experienced some downsizing changes as growers voted to remove two out of six production sectors. Following a members' survey, the organisation now focuses more on commercialisation and on marketing issues, than on knowledge exchange and advisory services.

Priorities were different in the past, when roughly 10 years ago, AHDB has conducted an in-house study to prepare for a strategic AKIS approach (Matthews and Bolton 2016). The report included some external views on AHDB which testified a high reliability of AHDB, providing high quality knowledge for the sector. Secondly, their role as creating partnerships among various AKIS actors and as particular interface with scientific research were mentioned (ibid:6). Internal analyses for the (then) 6 sectors showed strongest links between AHDB agents and both researchers and farmers, while advisors, training and education bodies and upstream and downstream companies mostly ranked second or even third (= weak links) (ibid:7). AHDB's still strong regional presence and positive impulses for exchange and collaboration were also confirmed by several interview partners in this study. In this respect, both the Monitor Farms programme and the series of projects conducted on the 5 Strategic Farms are starting points for various cooperation. However, whether and how well the overall KE feature will be maintained or even strengthened, was questioned by some interviewees, as AHDB has undergone a phase of turbulence with the departure of two of its six sectors and a reorientation of the organisation's mission towards concentrating on market performance. Thus, there are internal differences between the different sectors to what degree marketing and advertisement activities have to be prioritised against research and experimental work, so that consequently, AHDB is seen as in a phase of reorganisation with lessened presence in and impact on the AKIS.

While AHDB has a strong membership, smaller, voluntarily funded levy bodies exist such as the British Beet Research Organisation (BBRO) and Processors and Growers Research Organisation (PGRO). The former provides a few figures on levies mobilised in their annual report (04/2022-03/2023), from which an 18% share of the total expenditure is spent for 'knowledge exchange' (p6 of AR), and that a so-called advisory report is used by 1250 people on average. The latter PGRO tackles pulse crops and include an own horticultural section, and is active in national and international research projects. No public information about the number of members is available except that their magazine is sent to 15000 people in the UK. Beside these levy organisations, there are of course many more producer organisations, e.g. in the fields of animal breeding, special horticultural crops, marketing etc.

There are three organisations that can be considered as farmers’ and farm managers’ unions: NFU (National Farmers Union), TFA (Tenant Farmers Association) and CLA (Country Land and Business Association). The information they provide on their websites varies considerably and it is not possible to obtain reliable figures on how many farmers and farm managers are members in each of them. On their website, NFU mentions their 45,000 members for the whole UK, so that clearly less than 50% and most likely more than 30% of farmers in England, are members. NFU is represented with seven regional offices, 50 local advisers and more than 380 NFU representatives across England and Wales (NFU Cymru), which makes it likely that in every county there is at least one NFU advisor, and 5 – 8 NFU contact farmers. TFA is association engaged for those farmers who are not the owners of the land they farm, with the aim to provide advice and support “on all aspects of agricultural tenancy, land occupation and ancillary matters, (...)” as well as “to improve the professional and technical knowledge of its members”. For this purpose, TFA collaborates with 55 chartered surveyors (cf. section 4.4.3), accountants and solicitors (...) and a network of members who have volunteered to act as Local Leads for the Association on a county-by-county basis across England and Wales”. In a similar way, the Country Land and Business Association (CLA) is the membership organisation for owners of land, property and businesses in rural England and Wales and declares to represent 28000 members.

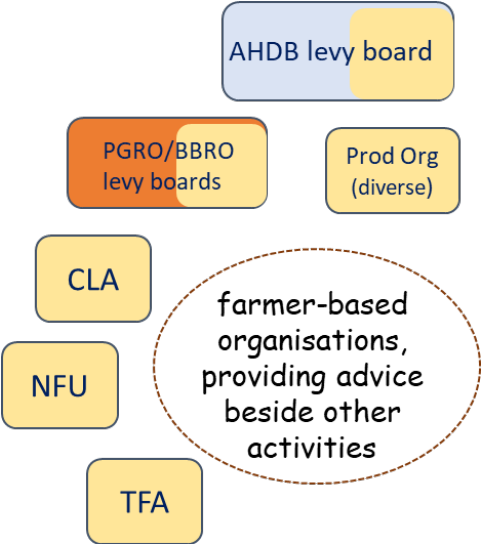


Fig 7: Farmer interest organisations

Summarising, farmers in England are widely organised in and represented by a number of organisations that are important in membership and reputation. Particularly, AHDB has a broad recognition as an influencing actor. However, there may be a reduction rather than an increase in reach of AHDB for due to the loss of members and an emerging focus on marketing rather than on knowledge exchange activities. Secondly, together the farmers unions are covering a broad majority of England’s farmers, presumably up to 80%. Given to their primary objective of representing and lobbying for farmers’ interests, their presence as KE and innovation support actors is clearly less visible in the AKIS, which means that they are less frequently referred to, than e.g. the farmer-led advisory organisations mentioned in 4.4.4. However, their opinion-forming influences and lobbying power towards political and administrative actors may not be underestimated.

4.4.6 Research and Education

Agricultural research is represented with organisations such as universities, colleges and other research institutes, with either public, private or mixed funding. As for this study, it is important to mention that their range can't be limited to England only, because all of them are operating either at UK level or at least cover several of UK's countries.

There are several umbrella organisations for agricultural research bodies, e.g. the Agricultural Universities Council (AUC), uniting 16 universities with a specialisation in agriculture or related fields, and the Landex group, comprising 36 universities and colleges involved in land management studies in England, and 3 in the wider UK. There are intermediary bodies to support the linkages between universities and political decision making (e.g. CEIA) or between applied universities, colleges and demonstration farms (e.g. Farmer Science Network, SFN). Besides the organisations that unite research and tertiary education, there are research bodies such as Rothamsted Research¹⁶ or the John-Innes -Institute with longstanding research traditions and wide international reputation. Others that have been more recently inaugurated like the Agri-Tech Centre (formed by a merger between three established the Agri-Tech Centres – CHAP, CIEL and Agri-EPI) were by far less frequently visible in documents and interviews.

A recent attempt to reach a better integration of scientific agricultural output and farmers' needs and interests on technologies and information was undertaken 2022 by 'Food and Farming Futures' organisation, an independent consortium body engaged with the national libraries for agri-food¹⁷, in corporation with Harper Adams University's School of Sustainable Food and Farming. The conduct of a webinar on how 'the application of science could be best delivered to ensure a just agricultural transition in the United Kingdom (UK) in response to the Agricultural Act 2020, climate change and the reality of a war in Europe' resulted in the creation of a high expertise working group¹⁸. The group developed 9 recommendations among which an increased public funding of advisory services and the spread of scientific information, a stronger engagement of university staff with agricultural extension, the establishment of a 'What-Works Centre' and the integration of the agri-tech-centres and AHDB following closely the communication among the various AKIS stakeholders with a focus on the farmer-researcher interactions. One of the follow-up activities to this comprehensive and ambitious endeavour was and is the setting up of the above mentioned 'Sustainable Farming Network', an initiative funded by McDonald, Morrisons and NFU with the aim to integrate all UK demonstration farms or their networks, including those maintained by industries. The setting-up of this network was still ongoing, when this study was made with one person organising a kick-off meeting, motivating representatives of the roughly 20 bodies to jointly create a forum with a platform structure, a yearly conference and quarterly coordinators' meetings (SFN, pers. comm.).

¹⁶ Rothamsted Research is an independent charitable company, limited by guarantee and governed by a Board of non-executive Trustee Directors. The entirety of 'Rothamsted' and its activities are an enduring partnership between Rothamsted Research, The Lawes Agricultural Trust and the BBSRC, who share a common interest in advancing agricultural science for the good of all.

¹⁷ <https://farmpep.net/FFF>

¹⁸ https://cdn.harper-adams.ac.uk/document/page/705_Application-of-Science-to-Realise-the-Potential-of.pdf

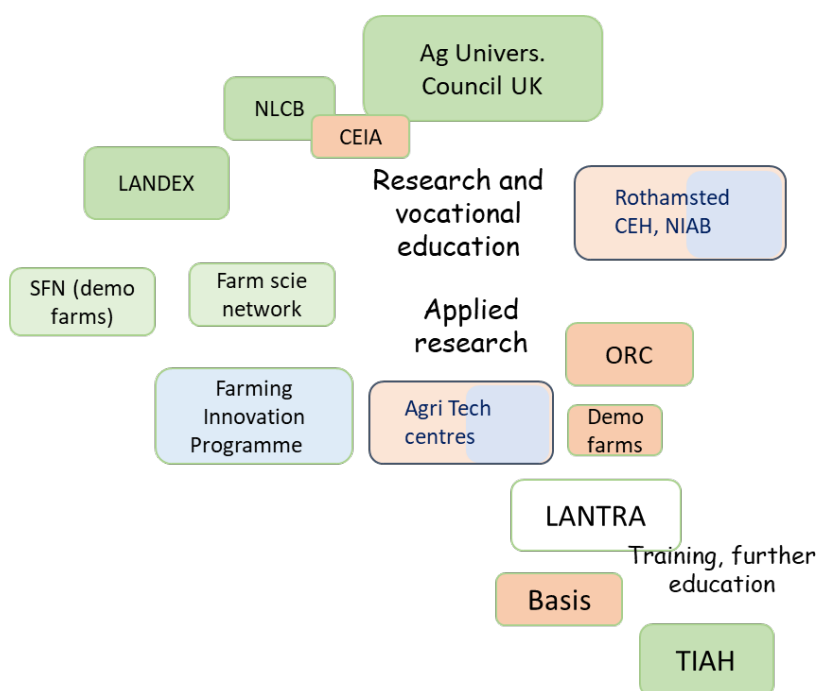


Fig.8: Research and education bodies

Many of these research bodies, particularly universities and colleges, contribute with teaching and further education courses to the systematic access to agricultural knowledge for AKIS actors and thus form an important part of the formal education system for tertiary qualifications. In addition, these and other institutions also offer farmers and other specialists in the sector the opportunity to take advantage of professional training and further education. The most important players in this latter area are LANTRA, Basis and TIAH.

Detailed descriptions for a selection of organisations in this field

LANTRA is the well-known body providing further education and targeted professional training to the green sector in general, an umbrella organisation for training in several fields, and in particular agriculture and horticulture. On their website, LANTRA declares to work with 350 specialists in the UK, although with a particular focus on England to set up certified training programmes and recognised qualifications tailored to the specific needs of farmers and other land use actors.

Clearly targeted to agricultural advisors' further education and qualification, the Ltd and registered charity company BASIS offers Continuing Professional Development (CPD) through a broad range of accredited courses on agronomic topics, particularly on pesticides and fertiliser management. Basis operates with a staff of roughly 30 people to organise the provision of courses, which are grounded in agreed upon syllabuses. Course trainers are subcontracted freelance trainers and staff from private or public organisations (companies, charities, universities etc.) with expertise for particular courses. Contents of training courses is developed independently by trainers, in the frame of the syllabus while exams to prove the learning achievements are organised by Basis. Syllabuses are regularly monitored, discussed, updated and modified by committees that comprises representatives from farmer organisations (e.g. NFU), authorities (DEFRA), advisor organisations (AICC) etc. A very close partner for

Basis is the Harper Adams university because it gives accreditation to courses which allows for certification. Since its setting up in the late 70s, Basis has trained approximately more than 6000 people (with an increasing number of farmers) in the UK and qualified 3000 advisors with the FACTS programme since 1993 (Basis, pers comm, 03/2024). Basis has statutory tasks such as an annual inspection scheme to audit pesticide stores and ensure their operation presents minimal risk to people and the environment; the organisation also manages the registers for qualified professional pesticide and fertiliser advisers and for public health pest control professionals; another feature is a database with 311 environmentally qualified agricultural advisors in the UK (04/2024) who can be contacted via their website. With respect to internal knowledge quality management, it is reported that the staff receives reports from trainers, participants and examiners for all courses, which allow a good follow-up on the topics and on the performance of the courses.

Recently founded TIAH (The Institute of Agriculture and Horticulture) is a charity body to support life-long learning, skills acquisition, and provides advice. TIAH was induced by DEFRA in cooperation with AHDB. Particularly for the field of organic agriculture, the Organic Research Centre (ORC) offers education and training measures in combination with own research activities. ORC is an independent charity organisation, depending on donations, and financial support from trusts and foundations as well as on funds from projects. The organic research centre has celebrated 40 years of independent research on organic and agroecology farming practices in 2021, and beside research, the organisation is also active in maintaining the agricolgy exchange platform with videos, webinars and other information packages.

Summarising, there is an impressive multitude of public colleges and universities who have agricultural departments or schools and by this are connected to the agricultural sector, and many more than those mentioned here, are active. However, their presence in, and effects and impacts on the AKIS are not broadly visible, obviously characterized by project-type interventions that are limited in time and space. Notable exceptions are Harper Adams University (HAU) and Rothamsted Research which were mentioned several times by several interviewees. A third obviously very important actor in this particular field is obviously Basis who has a gatekeeper role for the quality management of advisory services in the field of arable production.

4.4.7 Farmer-led learning and change

During the desk research, it became apparent that there is a multitude of farmer-centred, farmer-led initiatives, projects and networks in England, which connect farmers with other actors in the AKIS in order to bring about innovations and change. These manifold organisations vary strongly with respect to (i) their degree of institutionalisation and permanence, (ii) the organisational features of the main actors (e.g. public/private, for-profit / not-for profit), and (iii) their content orientation. What is cross-cutting, is a strong emphasis on 'peer-to-peer' learning and the focus on on-farm practices and experiments. Following a common international trend, we label these organisations as 'innovation networks', which highlights two characteristics of (i) driving change in agriculture and (ii) bringing together autonomous actors in voluntary, insight-based cooperation.

In the following, we present a selection of such networks, trying to exemplarily cover the huge diversity. Many of these networks are affiliated to one or several of the actors mentioned in the previous sections. However, as they tend to unite actors from several fields and as some of these

bodies come with independent missions, we decided to create this new field of hybrid networks' actors. For their descriptions, we make mostly use of text from the respective website.

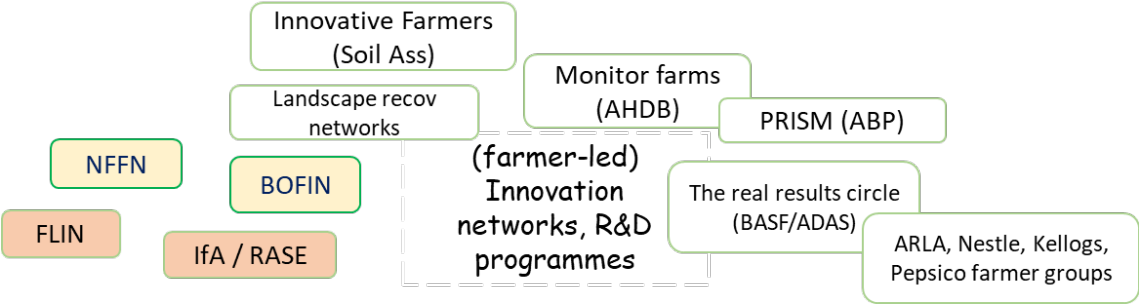


Fig. 9: Innovation networks around on-farm research

Detailed descriptions for a selection of organisations in this field

The Innovative Farmers network (www.innovativefarmers.org) is made up of a growing group of forward- thinking farmers and growers, researchers and advisors, working together to tackle the challenges which farming faces. The network is supported by researchers and businesses who understand the vital importance of farmer-led innovation. Primary aim of the organisation is to conduct practice-relevant research in form of on-farm trials, also framed as ‘field labs’. 19 Innovative Farmers was formerly known as the Duchy Future Farming Programme and is currently primarily funded by the King Charles III Charitable Fund through the sales of Waitrose Duchy Organic products. The programme is managed by the Soil Association (cf. section 4.4.3), IfA is involved with facilitation activities, and many of the UK's top agri-research organisations have been involved in field labs of the Innovative Farmers’ network. This information is made transparent through their website.

In a similar way, BOFIN (the British On-Farm Innovation Network) is a farmer-centred network, which unites farmers and other actors who are ready to engage in national and international on-farm research projects, as e.g. called for by EU research programmes such as Horizon Europe. While BOFIN is generally open to farmers and scientists, who want to engage in on-farm research around crop production, there are also partly or fully closed networks, frequently driven by private companies. Examples are ‘the real results cercle’, a cooperation of BASF and ADAS with a number of farmers, established in 2016 and operated with 6 demo sites, which are declared to be openly accessible, and the PRISM initiative of ABP. Well-known in the sector is ADAS maintaining the Yield Enhancement Network (YEN) established in 2012, which however does not aim at farming practices’ change primarily. Similarly, many universities, public research centres and private companies, including so-called distributors, have single demonstration farms, farm clusters or demonstration farm networks, which in sum, may be numerous although exact figures are not known.

¹⁹ Examples of the OFE network are documented by Lacoste et al. 2022, comprising the Yield Enhancement network (YEN) and the Farmer Innovation Groups (FIG); <https://www.nature.com/articles/s43016-021-00424-4/figures/3>.

Well-known is the 'Monitor Farm' scheme that is established by AHDB with particular focus on e.g. cereals and oilseeds production (pers. comm.). Farmers can apply to enter the scheme for 3 years and are then supported to host four to six meetings on their farms each year and to have all aspects of their business scrutinised and receiving advice on making developments in their business management, improving productivity, competitiveness and environmental management. Since 2014, over 40 Monitor Farms have brought together groups of like-minded farmers who wish to improve their businesses by sharing performance information and best practice.

An initiative, to bring this diversity of demonstration farm networks together for exchange and collaboration is the recently (2024) set-up umbrella organisation 'Sustainable Farm Network' (SFN), initiated by Harper Adams University together with the Landex network to form a network of networks. Apparently, funds from commercial food enterprises have been mobilised to bridge the immense diversity of farm-level knowledge generation and exchange initiatives in order to reduce.

In parallel to the manifold networks for innovations in agriculture, regenerative farming etc., also new organisations were created and infrastructures set up with the aim to network among them, to integrate and to coordinate activities and initiatives and to enhance cooperation. One example for such an umbrella network is the Farmer-Led Initiatives Network (FLIN) which comprises public, private and research organisations and aims at sharing best practices for the support of farmer-centred research. FLIN itself does not have direct contacts with or services for farmers, but it is useful in connecting and sharing of learnings.

Then, there are digital infrastructures, platforms, that support the spread of information and open the way for exchange and cooperation. FarmPEP is an example for such a platform, a facilitated online structure, that was set-up to act as repository for outputs and create transparency about and support cooperation among the manifold actors engaged with knowledge exchange on agriculture related topics. It is organised in form of a wiki and structured in the three fields 'topics', 'organisations' and 'people'. It also provides descriptions and definitions in a glossary. Set up and maintained by ADAS and funded as a Innovate UK project, FarmPEP is a collaborative community endeavour, initiated in January 2020 together with bodies such as Agri-TechE, CCRI, Innovative Farmers, Open Coop and The Farming Forum. Agricolgy, another knowledge and information platform on organic farming and regenerative agriculture, was set up by the Organic Research Centre (ORC) in 2015, it contains information on farmers, farming practices, a research library, a blog on events etc. Another platform, although different in format and objectives, is Farming Forum: it provides any farmer who registers with the possibility to meet others for exchange on a huge range of particular topics. Thus, the platform serves as a living documentary of information, but without facilitation or quality management.

Summarising, there is an impressive amount of initiatives where AKIS stakeholders from research, consultancies, commercial companies and other fields directly engage with farmers for knowledge exchange and innovation. Thus, the insights that farmers have a high preference to learn from colleagues and that innovations need site-specific adaptations to be implemented are widely known and respected by the various actors. This is a strength which however is not (yet) translated into visible impact because, as demonstrated, the diversity of such networks and initiatives is very large and there are neither actor coordinating nor enduring knowledge integration activities perceivable.

4.4.8 Brief summary on AKIS actors' diversity

As can be easily seen from the previous sections, the diversity of actors in the AKIS in England is amazing, and to create a comprehensive overview with a restricted amount of resources seems impossible.

More concretely, we showed that and how the diversity reigns in each of the AKIS subsystems we described above; e.g. there are always several influential actors that engage with and offer their services to farmers, so that they have several up to many choices in many places of England. For the actors within the various groups, this diversity leads to competition, a situation that is very present for the for-profit actors, while it was not a topic raised by interviewees from the not-for-profit organisations. In particular, the funds mobilised from trusts and foundations in combination with publicly financed projects seem to be a reliable source of means for the many civil-society and farmer-led initiatives and, non-governmental bodies.

Finally, a deficit of effective coordinating mechanisms and structures is another obvious fact that is valid for the AKIS as a whole as well as for its subsystems. Former strong players who were recognised for their reliable and even impartial knowledge generation and spread, tend to reduce weight and may lose influence, while emerging bodies with knowledge providing functions, seem to have difficulties to get established and widely recognised. In this regard the role and performance of umbrella organisations and of platforms is worth a deeper look and study. On the example of AIC it was explained how an umbrella organisation can contribute to the knowledge and innovation management for a particular group of for-profit organisations. On the example of the FarmPEP platform, it may be possible to study in how far such platforms effectively contribute to effective knowledge exchange and networking among initiatives, projects and other AKIS actors.

4.5 Fragmentation and cooperation in the AKIS

Almost all interview partners agreed that the English AKIS is fragmented, this appeared as a widely accepted, and frequently deplored fact. Actually, fragmentation can be easily illustrated with the lack of any coordinating structure or mechanism at national level, and it becomes important given the multitude of actors in the field. So, all in all, we are noticing an astonishing number of actors engaged in knowledge provision and exchange, however, as several of the interviewees strongly pointed out, there is a big difference between the structures in the field of arable production and the specialised meat and dairy production. As downstream value chain actors in the latter field are distinctively more concentrated and, farmers frequently contractually integrated, the competitive play of knowledge and innovation providers is clearly reduced in this field compared to arable and mixed farming. Thus, fragmentation of the AKIS refers to the overall picture, while there are well or fairly integrated compartments for some production sectors and within some regions.

In this respect, the role and the aims of the biggest actor, the national government actor DEFRA, remain unclear, and there is ambiguity: while objectives and measures for integration and coordination are not visible or tangible, targeted interventions for particular objectives are broadly explained and tightly pursued. Several interview partners expected that DEFRA will continue and increase the (financial) engagement for more environmentally friendly and net-zero oriented farming practices and this in combination increased funding for advisory services. This creates incentives for for-profit advisory bodies to check whether they want to extend their activities in this field, build-up internal competences

and structures, and it comes also with the challenge of determining how to access reliable and relevant knowledge in this field. And although DEFRA interacts with AKIS stakeholders, e.g. when designing new policies or when evaluating measures, with sometimes very close cooperation and deliberation, some interviewees observe a lack of internal communication and coherency of the programmatic approach, so that the teams that are responsible for the various programmes do not mutually coordinate with each other. This results in a siloed structure and does not sufficiently correspond to the agricultural realities where topics are connected and need to be integrated at farm level.

A number of AKIS actors was frequently mentioned as trustworthy and recognised organisations with a potential to play an important role for the integration of other actors and sharing and provision of relevant knowledge. Such organisations were AHDB and ADAS and this was frequently related to their past role as providing free advice to all farmers (ADAS) or to represent all farmers as a statutory body with thus, remarkable means, a good regional presence and a strong reach of farmers (AHDB). Both organisations have lost a part of their power and agency for various internal reasons. Nevertheless, due to their longstanding experience, their regional grounding combined with a national coverage, they are still attributed with the ability to take over a bigger role with respect to wide-reaching knowledge exchange activities. As for knowledge provision, the two most frequently bodies mentioned were Harper Adams University and Rothamsted Research, and this was true for both, for-profit as well as not-for-profit advisory organisation. A somehow hidden cooperation champion seems to be Basis, who acts as a hub for training activities and in this sense engages with experts from all fields and organisations (although with a focus on arable production, pesticide management etc.).

Although the AKIS is considered fragmented, there were many reports on various kinds of cooperation among diverse partners going on, not only bi-laterally but equally those involving several different partners. Thus, there is a huge repertoire of cooperation skills and experiences among the various AKIS actors. However, this cooperation tends to be project-wise and frequently depending on (good) personal contacts, joint successful experiences, shared views etc. Frequently, advisors working as facilitators for farmer groups or networks invite experts from other organisations, be it public or private, for-profit or not-for-profit, because of their particular expertise. Thus, local and regional spot- or topic-wise cooperation on agricultural issues exist, although the quality and the frequency of such activities may strongly vary, regionally.

In a similar way, cooperation occurs between advisory organisations and research bodies: frequently it is established around a topic and as a project, and once, funding is expired the cooperation ends. Thus, there may be more knowledge exchange and, cross-fertilisation among various AKIS compartments and fields of production and land use, than is apparent, however, the gains remain accessible to the involved partners only, and there is way to systematically disclose them to the wider public. Although the present study fulfils its objective of providing a (snapshot) overview of the AKIS in England, it equally reveals the blind spots and information deficits with respect to farmers' needs and interests and the degree to which they are satisfied through the diversity of service actors.

5 Discussion and conclusion

From the presented description and analysis of the AKIS situation in England, we propose to look deeper into a few points and discuss their implications, namely

- a widely shared support to peer-to-peer learning approaches in knowledge exchange and innovation support,
- the messiness of small initiatives for sustainable, regenerative, agroecological agriculture and the impossibility of overcoming this diversity through inclusive tools such as digital platforms,
- the fluid character of partnerships and cooperation features due to both, a reliance on individual engagement and frequent project-wise funding structures,
- a lack of concern about subject matter knowledge's quality management that seems to be manifest in this field, and
- a lack of knowledge about the farmers, their needs and interests with respect to knowledge acquisition and learning.

As an outsider to the AKIS in England, it was surprising how widespread and accepted the farmers' peer-to-peer learning concept is among the various AKIS stakeholders: not only grassroot initiatives promote it, but it is equally common in the texts and statements of environmental organisations, private commercial companies and governmental bodies. Obviously, this conceptually convincing and methodologically challenging approach has made its way through all the subsystems and sectors, so that many if not all professional actors seem to be aware that knowledge dissemination is not a result of a one-way transfer between two entities, but of active engagement of many, at best supported by adequate communicative procedures and means. This prevailing understanding is both, a strong point with respect to the recognition of farmers' realities and a challenge with respect to the scaling up of relevant and reliable insights on sustainable farming practices.

From the creative diversity of farmer-centred, farmer-led initiatives and networks, inspiring and driving transition towards more sustainable agricultural practices, to a messy multitude of groups and arrangements, working in parallel and with merely locally or topically limited influence, is only a small step and, it is worth to discuss which of the two views is better fitting the current situation and what the strong points and the challenges are, that come with this situation. Particularly interesting would be to obtain the perspectives of farmers' interest associations like NFU, CLA and TFA, in this regard, as they together represent a high share of the farmers in England and may worry about the unity of their clients.

Another strong point observed is a widely present ability of the AKIS actors to cooperate with others in the fields of knowledge exchange, innovation support and in research activities. On-spot cooperation was frequently mentioned for the organisation of events: experts from all, private for and not-for-profit, and from public bodies, are obviously easy to mobilise and to contribute around specific (subject matter) topics in local and regional events. Such events are gain- and insightful for all who come because they potentially provide updates on political, regional and topical farming facts and findings. Secondly, also cooperation among diverse partners to realise projects are frequent, and according to several of our interviews, the actors know who would be competent partners and they seem to be mostly successful in creating well-working cooperation constellations. However, due to the competitive and project-driven character of the public-money driven knowledge generation, there are

no longer long-term standing partnerships maintained among heterogenous partners. Again, it can be discussed whether the fluidness of professional relations is rather a strength or a weakness of the AKIS. The question of how knowledge quality management is realised was raised in the interviews with several partners and not many did report on respective organisation internal measures and procedures. However, this question is even more relevant, when looking to the current and possibly further growing diversity of KE actors that competitively engage with the manifold topics related to e.g. ecosystem services and climate change mitigation, based on public funding incentives. One possible mechanism for the creation of transparency in such polyphone choirs of a pluralistic knowledge and innovation system is the creation of fora, of places, structures and times, where topics are openly presented, discussed and results documented. Such mechanisms can be conferences, fairs, platforms, in both f2f or virtual forms with a facilitation, editing and annotating component etc, meaning that both a systematic, inter-subjectively plausible form and degree of content cross-check as well as a certain durability of the product are warranted. There are a number of examples for such interventions towards the transparency creation and the appraisal of knowledge quality, however with no evidence yet of their performance and effectiveness. A further point to highlight is the perceived commodification of knowledge generated and kept in the private sector. Data and knowledge has always been seen as a private good offering a competitive advantage and rarely shared. However with the increase of supply chain company facilitation of farmer and producer groups and data collected and stored in agronomy digital platforms, this aspect may characterise AKIS of the future.

Finally, the lack of statistical data on farmers' socio-economic situation, their interests, needs and perspectives, particularly from those, farming the bigger part of the land or producing the major bulk of meat and dairy, impedes more targeted tailoring of public advisory instruments. Not sure whether to keep this last point.

With respect to the initially formulated objectives, we conclude that the undertaken diagnosis of the AKIS was effective as it resulted in a broad overview document that adds to the previous literature. Particularly, we propose a more differentiated view on the non-public AKIS actors, some typical features and related impacts on their agency in the AKIS and, give a rough appraisal of the broad field of agents that are engaged with advisory and innovation service provision. From the interviews with AKIS stakeholders, we identify as particular strengths the manifold organisational arrangements that involve farmers into peer-to-peer learning and multi-actor innovation development processes. There is little empirical evidence on what interventions would best fit to increase the coordination of the AKIS in England, but some attempts can be observed to improve it through the set-up of networks and platforms. An evaluation of such infrastructures with respect to their outreach, effectiveness and, even efficiency could establish a basis for more targeted interventions in the future.

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