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Achieving best-fit configurations through advisory subsystems in AKIS: case studies of advisory service provisioning for diverse types of farmers in Norway

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ABSTRACT

Purpose: In light of the discussion on ‘best-fit’ in pluralistic advisory systems, this article aims to present and discuss challenges for advisory services in serving various types of farmers when they seek and acquire farm business advice.

Design/methodology/approach: The empirical basis is data derived from four workshops, five interviews with staff from advisory organizations, and interviews with 11 farmers.

Findings: Emerging configurations serve different types of farmers, that is, private advisors serve different clients in different ways; these could be considered subsystems within the overall advisory system.

Practical implications: Best-fit configurations of advisory services exist within a country setting in response to farmers’ information demands and how they seek information, as well as public goals of the advisory system, and lead to advisory subsystems. Policy-makers should monitor the emergence of these subsystems and become active participants in some of them, in line with the concept of the public sector as regulator of private and commercial advisory systems.

Theoretical implications: Best-fit has been mainly explored at country level, but this study shows that, within countries, different advisory service configurations are formed. So, best-fit should not be considered at national level only, in view of subsystems which can have wider or narrower boundaries. More broadly, the concept of Agricultural Knowledge and Innovation Systems (AKIS) should not be confined to the national level, for example, in view of farmer specializations within countries and the international dimensions of advisory systems.

Originality/value: The originality lies in the further unraveling of heterogeneity within AKIS and what this implies for advisory service delivery configurations.

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Introduction

In recent decades, many countries have undergone changes such as decentralization and privatization in their agricultural advisory systems, leading to more commercialized agricultural advisory services provided often on a fee-for-service basis (Garforth et al. 2003; Klerkx, De Grip, and Leeuwis 2006; Labarthe and Laurent 2013). Although this has been reported as leading to greater client satisfaction, concerns have also been raised regarding farmers' access to farm advice and the breadth and depth of topics addressed by agricultural advisory systems (Klerkx and Proctor 2013; Labarthe and Laurent 2013). As the commercialization of agricultural advisory services raises challenges relating to uneven distribution of farm advice (Labarthe and Laurent 2013), it has been found essential to complement commercial advisory services with public advisory services that reach different types of farmers, for example, small farmers or farmers who do not engage in active information-seeking behavior (Jansen et al. 2010; Prager et al. 2016). It is also necessary to pay attention to topics that may not be of high private interest but may have a more public good character, for example, environmental and rural development issues (Klerkx and Jansen 2010; Vrain and Lovett 2016), and thus do not always stimulate farmers to autonomously demand services related to these topics.

As all countries are different in terms of the composition of their agricultural systems and value chains, for example, their governance structures and their political ambitions for agriculture and rural areas, it is argued that there is no 'one-size-fits-all' agricultural advisory system. Instead, it is argued that each country should achieve 'best-fit', that is, 'advisory services that "best fit" the specific conditions and development priorities of their country' (Birner et al. 2009, 343). However, achieving such best-fit is challenging given the heterogeneity of farming and farmers and farmers' abilities to identify the most appropriate services for them (Klerkx and Leeuwis 2008; Kilelu, Klerkx, and Leeuwis 2014). Furthermore, advisory service providers must develop and adjust their own organization, methods, and practices to meet farmers' different needs and connect to different farming styles and goals (Aguilar-Gallegos et al. 2015; Kilelu, Klerkx, and Leeuwis 2014; Vanclay et al. 2006).

Studies have been conducted on how demand and supply configurations in advisory systems are shaped and an optimal fit between demand and supply is achieved (e.g. Ingram 2008; Kilelu, Klerkx, and Leeuwis 2014; Phillipson et al. 2016; Landini 2016), but such work focuses mostly on the individual advisor-farmer interface or on project level, or on a whole country level. However, how advisory services connect to different segments of farmers within countries, with different information needs and farming characteristics, has rarely been studied. The aim of this article is therefore to present and discuss challenges for advisory service providers in serving various types of farmers when they seek and acquire advice, in light of the discussion on best-fit. The overall research question of this article is how advisory services achieve this best-fit and what arrangements emerge, with three sub-questions:

- (1) What different advisory service providers and advisory service configurations exist in Norway?

- (2) What relationships exist between different kinds of farmers and advisory service providers in terms of how farmers articulate demand for services and how advisors supply them?
- (3) How does the Norwegian advisory system respond to challenges in dealing with this diversity and achieving best-fit?

We first present a conceptual framework before empirically describing the Norwegian advisory service. In the discussion and conclusion, we point to the advisory services' main challenges in meeting farmer needs and some of the solutions they adopt to cope with these challenges. Furthermore, we reflect on what our study implies for the best-fit of advisory services, and the broader implication for advisory systems and knowledge and innovation systems more generally.

Conceptual framework

The best-fit framework

Agricultural advisory services are defined in this article 'as the entire set of organizations that will enable the farmers to co-produce farm-level solutions by establishing service relationships with advisors so as to produce knowledge and enhance skills' (Labarthe et al. 2013, 10). Agricultural advisory services assist farmers in a broad range of issues, for example, technical, financial, business management, ethical (animal welfare), and regulatory, which are often interconnected and thus require complementary or joint efforts between several advisors (Klerkx and Jansen 2010; Phillipson et al. 2016). The agricultural advisory system is part of the broader Agricultural Knowledge and Innovation System (AKIS) (EU SCAR 2013), which forms a broad governance framework for advisory services in relation to other innovation support arrangements such as research, education, and innovation funding (Knierim et al. 2015; Hermans, Klerkx, and Roep 2015). Birner et al.'s (2009) best-fit framework provides different analytical categories to assess advisory systems: (1) governance structures, (2) capacity in terms of staff numbers and skills, (3) management of advisory organizations, and (4) advisory methods in terms of techniques and styles. The aim of the best-fit framework is then to see how this provides a fit with the farming and policy context, consisting of (1) political system and agricultural development policy, (2) overall advisory system capacity to serve all farmers well, (3) production systems and markets, and (4) community aspects such as land size and education levels. We use this framework to outline the main features of the advisory service, as well as the farming and policy context, which is briefly sketched at the beginning of the Results section. We now further elaborate on how the literature considers diversity in advisory service provisioning.

Diversity regarding who is supplying agricultural advisory services

We follow Prager et al. (2016, 330), who make a distinction between 'private' as the status of an organization, and 'commercial' referring to activities carried out by the organization (e.g. offering advisory services for a fee). Just because agricultural advisory services are provided by private organizations does not mean they are necessarily commercial, as

government often continues to pay for public good advice (Klerkx and Jansen 2010). Commercial advisory services may be coupled with both selling and purchasing agricultural commodities but involving dedicated staff for advisory services (called embedded advisors by Klerkx and Jansen 2010), but may also be provided by advisors who provide only advice (called independent advisors by Klerkx and Jansen 2010). Besides advisors, farmers use different sources of information and support, such as media and peers, which often rank above advisors as most used sources (Gielen, Hove, and Nieuwenhuis 2003; Solano et al. 2003; Oreszczyn, Lane, and Carr 2010; Lubell, Niles, and Hoffman 2014). As several authors argue, farmers are often surrounded by networks of different complementary advisors (Klerkx and Proctor 2013; Phillipson et al. 2016), who also sometimes jointly offer integrated advice on complex issues that have several dimensions (e.g. technical, economic).

Diversity in relationships between different types of farmers and their demands and advisors and their advisory styles

Farmers are not a homogenous entity and have different demands for advisory services, and it is relevant and important for advisory services to consider this in configuring their supply (Jansen et al. 2010; Kilelu, Klerkx, and Leeuwis 2014; Aguilar-Gallegos et al. 2015). The well-known categorization of farmers' technology and practice adoption, denoting them as innovators, early and late adopters, and laggards (Rogers [1962] 1995), has implications for pro-active advice seeking (e.g. innovators and early adopters tend to be more pro-active). However, these categories often do not fully capture the various ways farmers can engage with advice and information, and they tend to be normatively applied to favor one way of producing over another (Gilles et al. 2013). Various variables and causes, such as farm size, asset status, and education, but also factors such as stability or turbulence in the regulatory environment, influence farmers' variation in demand for advisory services (Klerkx, De Grip, and Leeuwis 2006; Labarthe and Laurent 2013; Prager et al. 2016; Vrain and Lovett 2016). As Ingram (2008) argues based on her study of promotion of best management practices, farmers can be more pro-active or re-active in their relationship with advisors, and the relationship can be steered by either the advisor or the farmer, or can be more equal. As Jansen et al. (2010) argue, farmers may have several valid reasons for actively seeking advice or not. They distinguish between four types: Pro-activists, Do-it-yourselfers, Wait-and-see-ers, and Reclusive traditionalists. Following Jansen et al. (2010), in this article, we define an analytical typology with the following types:

- Pro-activists, who actively seek advice from advisors
- Do-it-yourselfers, who develop their farming in their own way, for example, by experimenting or seeking alternative sources of information
- Wait-and-see-ers, who seek advice but implement this to a lesser degree or at a slower pace
- Reclusive traditionalists, who do what they have always done or think they know best.

This typology does not necessarily cover all types of farmers but can contribute insights into how advisory service providers adjust their approaches and methods to farmer diversity.

Methods

The study focuses on four cases represented by four advisory organizations and their interactions with their clients: the agricultural business cooperatives TINE, Nortura, and Fellekjøpet and the advisory services cooperative Norwegian Agricultural Extension Service (NAES). The empirical basis is interviews with 11 farmers from Trøndelag region in 2014, observation at two workshops at national level in 2015, five interviews with staff from advisory organizations in 2015, and observation at two advisory service training workshops at regional level (Trøndelag) in 2016. We also examined advisory services' brochures and webpages describing services offered (more information about services below). The latter is especially important to get an overview of the Norwegian providers.

Eleven farmers from the Trøndelag region (one of the more intensively farmed regions in Norway) were interviewed through a semi-structured guide with questions on: the kind of advisory service they use, how they use the advisory service, how satisfied they are with the service, what services they lack, how services can be improved, how they pay for services, and how they keep themselves updated in farming. These 11 farmers were sampled from a list of 64 farmers compiled by advisory service staff and public authorities that are very familiar with agriculture in the region. We purposively chose the sample to achieve a variation in geography and production type as the longlist provided the farmers' addresses and their farm type. Three women and eight men (aged between 30 and 55) were interviewed; two of them were husband and wife and so this was a joint interview. Thus, 10 interviews were conducted at 10 farms. Two interviews were conducted in person and the rest by phone. Interviews were tape-recorded and notes taken during and after the interviews. Six of the 10 farms were dairy farms; of these three also engaged in grain production, one in forestry, and two in other significant activities (sheep, green farming, and contract tractor driving). Further, one farm grew vegetables, one kept chickens, one had pigs for slaughter and grain, and finally one had beef, poultry, and grain. Details of the interviews were reported in Norwegian (Stræte 2014). To analyze the interviews, we applied the typology based on Jansen et al. (2010). Although a typology is based on averages and cannot capture each individual farmer, the farmers interviewed could be assigned to one of the types. Five of them were characterized as Pro-activists, one as a Wait-and-see-er, and five as Do-it-yourselfers. As expected, none of the farmers was a Reclusive traditionalist because the method made it hard to access this type of farmer, so views on this type came from advisors. Given the small number of interviewees, these 11 farmers are not representative of all farmers or types of farmers in Norway, so the findings should be seen as indicative rather than conclusive. Ideally, a larger number of farmers with even greater diversity should have been interviewed, but limited resources made that impossible. That is a limitation of the study; and to counteract this weakness we observed at workshops to complement the data obtained from the interviews and enable triangulation.

The two 2015 workshops were organized to address questions relating to competence development for farmers and challenges for advisory services; they also generated data used for the study reported in this article. They were organized with a few keynote speakers, working in groups and plenary discussions. The two 2016 workshops were training workshops for advisors. From these workshops, the researcher could identify the issues raised by both farmers' representatives and the advisory services, observing the most

pressing questions and challenges. Data from these workshops were notes taken during and after the activity.

Finally, interviews were conducted with five staff (advisors and middle managers) from the four studied advisory service organizations. These interviews were open but related to the kind of service offered, the interviewees' experience of their service, whether and how they evaluated it, the challenges, and their strategies.

This data triangulation enabled us to answer the three research sub-questions. For research sub-question 1, mainly documents, websites, and interviews with advisory organization staff were used. For research sub-question 2, mainly interviews with farmers and observations at the 2015 and 2016 workshops were used (using observations with insights on how the advisors responded (or not) to the farmers' various needs). For research sub-question 3, mainly interviews with advisory organization staff and observations at the 2015 and 2016 workshops were used (observations on how the advisory services strategically and systematically responded to farmer diversity).

Findings

In this section, we present results relevant to the three main topics as articulated via the research sub-questions: the structure of the Norwegian advisory system, how farmers seek advice, and farmers' relationships with advisory services.

The Norwegian AKIS and advisory system in transformation in a changing farming and policy context

The Norwegian AKIS has transformed from a governmental-driven strategy with farming and public goods in focus into a commercialized business with farmers in focus. From the late 1980s, the agriculture sector in Norway, as in many other countries, shifted to more market orientation with less subsidization and an increasing focus on competitiveness. The number of farms declined and the remaining farms became larger and more specialized; and, thanks to rising productivity, total production volume also increased (Almås 2002; Forbord, Bjørkhaug, and Burton 2014). Specialization in production and new economic activities on the farm increased the need for specific competence building and related advisory service support to farmers. It follows that farmers needed not generic one-size-fits-all advice, but rather specific advice relating to their own situation and resources (Grande et al. 2014). This transformation in AKIS governance over the last 30 years has also affected the advisory system within the AKIS, for example, through a smaller budget for publicly funded advisory services at county and municipal level (Almås 2002). From the literature (Almås 2002; Grande et al. 2014) and also from the interviews with advisory organization staff, the following main implications of this transformation emerged:

- In governance: Less governmental support and public responsibility for provisioning of advisory services, but agricultural development is still a policy objective.
- In competencies: Both farmers and advisors face challenges in following up and implementing new knowledge and technology. In addition, advisory services are changing

working methods from recipe-based problem-solving and decision-making towards guiding and coaching-based methods.

- In organization: Advisory services need to develop market-oriented business models. From being almost always a free-of-charge service, it has moved to a situation in which farmers more often have to pay, and advisory organizations have to focus on being sufficiently profitable to remain viable. Such changes have also increased the competition among advisory service providers.

As a result of this transformation, a pluralistic advisory system has emerged:

- Advisors in the input supply industry, often in cooperatives such as Felleskjøpet Agri (<https://www.felleskjopet.no/>) (concentrate, fertilizer, machines, and equipment) but also many machinery suppliers and others. This service is provided by organizations that sell to farmers and in some cases buy from farmers.
- Advisors in the food industry, often in cooperatives such as TINE (<http://www.tine.no>) (dairy) and Nortura (<http://www.nortura.no/>) (meat). This service is provided by organizations that buy produce from farmers. TINE has organized its advisory service in a specific department, TINE Advisory Service. In the meat sector in particular, several competitors provide advice for farmers to various degrees.
- Advisors in independent organizations such as the cooperative NAES (*Norsk landbruksrådgiving*) (<https://www.nlr.no/>) and also independent private consultants.
- Advisors in relation to services like accounting, banking, insurance, breeding, ICT, farmer unions, and so forth. These services are provided or sold in addition to other services.
- Advisory services provided by governmental and public bodies, especially at local and county level.

The organizations considered in this study, the agricultural business cooperatives TINE, Nortura, Felleskjøpet and the advisory services cooperative NAES, are important providers of advisory services in Norway. They have taken part in the transformation over recent decades, even though they have developed in different ways, as the former three are involved in production and sales and the latter is independent. The main challenges for all of them are more specialized demand from farmers and the need to find new business models for their own advisory organizations. Currently, they have a comprehensive package of different advisory services, according to interviews with advisory organization staff and the advisory organizations' websites. These services include tools for production tasks and financial management, for planning strategy and managing farm activities, and for agronomical operations on the farm. The advisory services are also involved in a range of training for farmers, solely or in cooperation with high schools and universities. Using the analytical categories of the best-fit framework, [Table 1](#) summarizes the key features and activities of the main advisory service providers in Norway. All four providers offer services in all regions.

Advisors from the four cooperatives cooperate now and then. Such cooperation often also includes public sector parties and receives public funding. One example that emerged from interviews with advisory organization staff, documents, and websites is 'Green Research' (*Grønn forskning*), a regional program for Mid-Norway, which included the

Table 1. Main private providers of advisory services in Norway.

Name provider	Number of advisory service staff ^a	Type of organization	Overall education level staff	Main target audience	Type of advice	Advisory methods used	Type of client served	Funding	Way of payment
TINE	350 (TINE Advisory Service – separate department)	Dairy cooperative (embedded advice)	University and college, a few with Ph.D.s	Dairy farmers	Dairy farming, feeding, animal health, milk quality, economy, strategy	One-to-one advice, experience groups, meetings for members, packages of advisory services for specific issues, website	All types but top teams esp. the Pro-active, and obligatory meetings to include also reclusive traditionalists	Private, fee-for-service	Combination: One meeting free for members, payment per hour, or advisory package
Nortura	150 (divided over providing membership services and advisory services)	Meat cooperative (embedded advice)	College and university, and some with experience and other kinds of education	Meat producers (cattle, sheep and goats, pigs, and poultry)	Meat production, animal health, economy, buildings	One-to-one advice, meetings for members, introducing packages	All types but esp. the Pro-active in pigs	Private, some fee-for-service	Normally free ^b for members and potential members but payment for specific deliveries (management plan, etc.)
Felleskjøpet	240 (divided over input sales, providing membership services, and providing advisory services)	Input supply cooperative (embedded advice)	Various	Farmers in general	Concentrates, fertilizer, buildings, machinery, equipment	Intake discussions for new members on advisory service needs, one-to-one advice, meetings for members	All types	Private	Normally free for members and potential customers
NAES	330 (all dedicated to providing advisory services)	Specialized advisory service cooperative (independent advice)	University and college	Plant producers	Plant production, soil, organic, economy, strategy, buildings, machinery, landscape	One-to-one, field show, groups, packages of advisory services on specific issues	One-to-one esp. for the Pro-active in vegetable production Coordinators mixed with research esp. the Pro-active	Private, fee-for-service In addition, about 20% of revenue for NAES comes from governmental grants	Combination: Annual membership fee, payment per hour or advisory package, governmental grants

^aInformation from interviews and websites.^b'Free' implies no direct payment, but the cost is covered in the price of the milk sold or other inputs purchased.

region of Trøndelag. Green Research has, among other things, established meeting arenas for advisory services, research, and farmers. Another example is a project named ‘Competence boost for agriculture in Trøndelag’ (*Kompetanseløft trøndersk landbruk*), which organizes training workshops for advisory services across organizations. This project aims to solve common challenges for advisory services and agricultural education. A third example is *RULL* in Oppland county. This is a partnership between farmers’ organizations, the county, and the county governor, focusing on farmer learning on agronomy for example. All these examples get funding from regional governmental bodies and are examples of cooperation and partnerships between the private and the public sector. The key factor is that projects managed by farmers and/or advisory services can apply for and receive public funding and institutional support to carry out activities to deal with challenges that are too big or too difficult for the individual organizations to manage alone.

Farmers seeking advice and up-to-date information in different ways

Supported by the typology of farmers presented above, based on Jansen et al. (2010), below we give examples of relationships between the various farmer types and advisory services, and how, or whether, the farmers seek information from advisory services. These results are based on interviews with farmers and with advisory organization staff, plus issues discussed at the training workshops.

Pro-activists

Farmers’ view: This type of farmer makes explicit requests to the advisory service. They are often specific in their demands to the advisory service. When farmers invest in new technology (like automatic milking systems), they may develop a stronger relationship through specific advisory service packages. As one farmer said: ‘I am conscious about “picking” the right advisors.’

Advisors’ view: This is the ‘ideal farmer’ who needs to be served well; otherwise, they may lose her or him to other companies. These farmers are open to, and actively seek, external information. However, some advisors (and farmers) find that it can be difficult for advisors to meet these farmers’ level of competence. As an advisor said about advisors: ‘There is still a need for generalists but there is also a need for specialists.’

Do-it-yourselfers

Farmers’ view: This type of farmer seldom has a strong relationship with the advisory service. They may even be in conflict, that is, confronting ‘official advice’ that is regarded as ‘the truth’, or ‘shopping’ advice from different sources, including alternative as opposed to conventional sources (i.e. their regular advisor), as in general they distrust external information. As one farmer said: ‘... It is hard to make plans for farm management, to give economic advice and so on – they [advisors] do not at all keep updated. I feel I have better control myself by doing simple calculations.’

Advisors’ view: Advisors have mixed views on this type of farmer. On the one hand, these farmers can challenge advisors with alternative and often challenging knowledge, that is, raising very critical questions about the knowledge that the advisor is disseminating. On the other hand, advisors respect them and see a potential to learn more

themselves, as it can be an important correction. However, a main challenge is to establish constructive relationships.

Wait-and-see-ers

Farmers' view: This type of farmer often participates in meetings and in other activities organized by the advisory services and follows the regular advisory scheme from the advisory service, like annual meetings, analyzing fodder, drawing up a fertilizer plan, and so forth. However, they are not swift in implementing new knowledge, as they are in general more closed to external information. Some may need to be challenged to make progress.

Advisors' view: Farmer group activities organized by an advisory service may also be an arena for social meetings with colleagues. From the advisors' perspective, these farmers seldom challenge advisory services, but advisors face some specific challenges. First, advisors need to challenge some of these farmers now and then about their farm management, if there is a need for improvement or investment. Advisors require specific skills to do this in a balanced way, as the farmers have various motivations and ambitions for their farm. As an advisor said at a training workshop: 'It is a challenge to find out what the farmer really "needs". The farmer can see different causes for problems than I.' These farmers may not be so explicit in articulating the types of support they require.

Reclusive traditionalists

Advisors' view: There is in general no active relation between these farmers and advisory service providers. These farmers seldom make contact with advisory service providers. They generally farm their own way, as they are used to doing, or they are busy with other activities that make farm development and seeking information less relevant. Advisory service providers indicate that it is difficult to make contact and develop a relationship with this type of farmer. For some advisors, this is worrying, given public goals for the agricultural sector. They regard it as their societal mission to include all farmers in their advisory service.

Despite differences in relation to the different types of farmers, there are also similarities. The need for advice varies among farmers but, among those interviewed, there were examples of specialized producers that expressed a need for top quality expertise. Both Pro-activists and Wait-and-see-ers stated that advisors should be more assertive and challenge farmers more strongly. This requires advisors to have both professional skills and personal qualities to handle such issues. Further, some asked for a 'road map' to reach a peak level for their specific type of production; this is typical for farmers who are deeply involved in their business. Generic advice is not sufficient. The margins are so small that they need a detailed and scheduled follow-up plan. Some farmers mentioned a lack of such services.

However, advisors indicated that individual advisors cannot have expertise in everything. There is therefore a trade-off among the advisors to find a balance between specialization and universality. This carries a risk: the discussions clearly suggest that, if farmers do not have access to specialized knowledge, they go abroad to seek expertise; this is typical for Do-it-yourselfers and is also done by Pro-activists. Pro-activists may veer towards becoming Do-it-yourselfers if they do not achieve what they want, or 'shop' knowledge where it is available, domestically or abroad. Advisors can perceive it as a failure when

they are not able to respond to demand, but it could also be regarded as an opportunity to assist and facilitate the farmers to achieve such expertise, for example, abroad.

The results of this study indicate that advisory services are challenged to meet the demands of the various types of farmers. In the next section, we show how new configurations emerge to eliminate mismatches.

Emergence of best-fit configurations in the advisory system

Advisory service organizations are aware of the challenges in responding adequately to various farmers' demands. Here, we present four examples of different demand–supply configurations that have emerged in response to demands from different types of farmers. These configurations were identified from analysis of documents, websites, workshops, and interviews with advisors and farmers.

- (A) *Top team with expertise on feeding*: TINE has organized a national team of experts on feeding in dairy farming who should help the other advisors when needed, acting as a resource pool for the advisory service. They also contribute directly on farms regarding specific problems. This team maintains direct links to ongoing research to be up-to-date. For example, one of the interviewed farmers, a Pro-activist, had used this service and was very satisfied, as the following quote indicates: 'I am very fascinated by the feeding-advisors. They are top qualified ... and I have also a goal to increase my own competence, learning from them and make it my own, and become a better farmer little by little.'
- (B) *Coordinators between advisory services and research*: NAES has coordinators who are employed both in the advisory service organization and in a research institute (NIBIO). The purpose is to coordinate communication and activities between the two main actors on specific topics. As one said: 'The coordinators shall keep themselves up-dated and share knowledge with all the advisors in the organization and units.'
- (C) *Training on cooperation between advisors*: The project 'Competence boost for agriculture in Trøndelag' (*Kompetanseløft trøndersk landbruk*) organized training workshops for advisory services across organizations. The participating advisors were trained in working together in meetings with farmers. The purpose was to achieve a more holistic perspective on the farm. They were trained especially on their roles in meetings with farmers when representing two different advisory service organizations.
- (D) *Obligatory 'check-up' meetings between advisor and farmer*: TINE provides dairy farmers with a key advisor as the main contact between the farmer and the TINE Advisory Service. Included is an annual obligatory meeting between the farmer and the advisor. At this meeting, they go through all aspects of the dairy farm, including a farm inspection. As one farmer said, 'It is very good to have a farm visit and to know that someone else has checked how I do things at the farm.' The cost for this advisory service is included in the TINE cooperative membership. An important argument for retaining this obligatory meeting is to ensure that farmers are able to cope with TINE requirements on issues such as milk quality and animal welfare as this is important to safeguard the reputation of the dairy cooperative.

Table 2. Farmer types and examples of best-fit configurations.

Farmer type	Examples of challenges for advisory services	Examples of new configurations
Pro-activists	How to bring in the appropriate expertise to meet the specific demand for knowledge	(A) Top teams of expertise-sharing advisors (TINE) (B) Coordinators with shared employment in advisory service organization and in research institute (NAES)
Do-it-yourselfers	How to develop trust in relationships with farmers	No example identified
Wait-and-see-ers	How to challenge farmers when they are less motivated for change	(C) Specific training projects for cooperation between advisory service organizations
Reclusive traditionalists	How to make contact with farmers	(D) Obligatory annual meeting between advisor and farmer (TINE)

Table 2 exemplifies the relationships between types of farmers, challenges for advisory services in relation to farmer types (as described above), and how this is met by configurations that aim to support best-fit. The challenges were identified in interviews with advisory organization staff and in workshops.

Furthermore, Table 2 lists identified examples of challenges for which advisory service organizations have tried to meet the demands of specific types of farmers. However, the new configurations predominate in, but are not exclusive to, the target types. The study has not identified examples of configurations that are specific for challenges relating to Do-it-yourselfers. However, the advisors are very aware of this type of farmer and are trying to improve their skills for providing service in these cases as well, but without a specific arrangement to support that. The challenge is very similar to that for the Pro-activists, how to bring in the appropriate expertise, but it seems that lack of trust makes it harder for the advisors to forge a good relationship. The advisors need skills to engage with farmers who do not articulate a clear demand for advice; this may require specific support for advisors (Klerkx and Jansen 2010).

Public goals as a factor for targeting various farmer types

As already indicated, in pluralistic privatized advisory systems, addressing public goods can be complicated, and this is why advisory service organizations in Norway are concerned about serving most types of farmers. The Norwegian model of cooperation in the agricultural sector involves shared goals between government, farmer unions, and cooperatives. Farms must deliver on policy goals like producing for the domestic market, contributing to rural settlements, environmental goals (Forbord, Bjørkhaug, and Burton 2014). To do so, they are served by support instruments like subsidies, import restrictions, and market regulation. From the workshops and interviews with advisory organization staff, it seems that these conditions are regarded as essential to maintain Norwegian agriculture. Advisory service organizations are aware of this and therefore have an interest in helping all types of farmers to enable the agricultural sector to deliver public goods. One way to support public goods is to subsidize private advisory services (i.e. public funding and private delivery). In the Norwegian case, only NAES receives subsidies as basic funding, mainly for the organization's regional and local units. This way of governance can be argued to balance the governmental objective of stimulating access to advisory service in all regions with a strategy to be a market-oriented advisory service provider.

Discussion and conclusion: towards subsystems in pluralistic advisory systems?

The advisory service system in Norway, and more broadly the AKIS of which it is part, has been transformed from a public service to a highly privatized system. This study shows that advisory services in Norway are concerned about who they are serving and how they can serve most of the different types of farmers. A typology of farmers based on Jansen et al. (2010) was applied to explore the relation between types of farmers and advisory services: Pro-activists, Do-it-yourselfers, Wait-and-see-ers, Reclusive traditionalists. The results confirm the existence of several farmer–advisor relationships, depending on the farmer’s position, information-seeking style, and capability, resembling Ingram’s (2008) earlier findings. Sometimes, a good demand–supply match occurs, but, if this does not happen, arrangements are put in place to mitigate such systemic weaknesses, that is, installation of advisory system coordination and capacity building, as described by Klerkx and Proctor (2013).

Beyond confirming that findings from earlier work on farmer–advisor interactions in pluralistic systems are also found in the Norwegian case, there is an important emergent finding of specific configurations of farmers and advisors in the Norwegian advisory system (following earlier ideas of Phillipson et al. 2016) in response to farmers’ dynamic demands (Kilelu, Klerkx, and Leeuwis 2014). However, rather than being only configurations at the farm or project level as these other authors find, the Norwegian configurations might be considered subsystems of the national system aimed at achieving best-fit for a particular type of farmer. From our results, we have identified three types of subsystems.

- *A holistic subsystem:* This is an inter-organizational system of service supply with cross-over relations between advisory organizations to provide a more holistic perspective on farming and the service needed to support it. Participating advisory organizations both cooperate and compete. When agreements are reached and cooperative routines established, farmers are offered a better advisory service. This system makes it easier for farmers to access the appropriate advice. As regards the various farmer types, this system may be most helpful for farmers who are not seeking advice pro-actively. This means that Wait-and-see-ers are the target group for this subsystem.
- *An elitist subsystem:* This subsystem is organized as top teams of expertise established to overcome the expertise/generalist challenge in advisory service organizations. Generalists have first-line contact with farmers and, when needed, they can bring in expertise from top teams, which can be sourced intra-organizationally or cross-organizationally. This subsystem is most relevant for Pro-activist and Do-it-yourselfer farmer types.
- *A public goods subsystem:* Systems of private and public cooperation in regions can be found to work on issues that, for example, require a long-term perspective (like education, learning, competence) and are difficult to turn into a commercial service (like succession and recruitment, or environmental issues), and when there are difficulties in terms of willingness-to-pay or ability-to-pay. This subsystem seems to substitute former public advisory service provisioning and counteract market imperfections such as skewed access to advice for some farmer groups, which is an issue in many privatized systems (Labarthe and Laurent 2013; Prager et al. 2016). This subsystem serves

various types of farmers. The projects ‘Green Research’, ‘Competence boost for agriculture in Trøndelag’, and ‘RULL’ are all examples of this type of subsystem.

The concept of subsystems has both policy and theoretical implications. In terms of policy implications, as our results show, some of the identified subsystems are formed mainly because of private action to serve clients better (e.g. the elitist subsystem) and some are connected to public concerns (e.g. farmer exclusion and environmental issues in the public goods subsystem). We also observe less emphasis on developing subsystems that specifically target reclusive traditionalists; this resonates with earlier findings by Labarthe and Laurent (2013). Hence, policy-makers should monitor the emergence of these subsystems and become active participants in some of them, in line with the idea of government as regulator in privatized AKIS and mitigating shortcomings of private and commercial advisory systems (Klerkx, De Grip, and Leeuwis 2006).

In terms of theoretical implications, although earlier work has already touched on diversity in farmer-information demand and different kinds of advisory service supply to meet heterogeneous demands, our study has an important additional implication, given the finding on the emergence of subsystems within advisory systems. This has implications for the boundaries typically drawn around the study of advisory systems and more broadly AKIS, which are often national (Knierim et al. 2015; Hermans, Klerkx, and Roep 2015). As opposed to advisory systems that are seen as national and homogenous with best-fit within a given country setting and AKIS (Birner et al. 2009), best-fit systems emerge dynamically and have particular configurations within a country setting in response to types of farmer information-seeking and the system’s public goals. Furthermore, and perhaps on a more speculative note, given the international character of many advisory service firms and innovation projects (see Peiker et al. 2012; Rubalcaba and Toivonen 2014; Klerkx et al. 2017), such subsystems may even be international and encompass cross-border exchange, for example, in the case of the elitist subsystem in which farmers sometimes source knowledge from the best advisors available worldwide.

As our findings should be considered as tentative, a wider sample (e.g. including interviews in more Norwegian regions) as well as more in-depth study is needed on (a) the constructed typologies of farmer information-seeking and the related advisory service demand–supply match for each type, (b) the advisory subsystems, to better explore how they operate and study how stable or dynamic they are – whether they are permanent subsystems or more temporary configurations, and (c) the international dimension of certain advisory subsystems, including questions on how these cut across national AKISs, the kind of business models used within subsystems, and how knowledge and information is translated between international and local dimensions.

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