Social and Technological Transformation of Farming Systems:

Diverging and Converging Pathways

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Andrew Wilcox and Karen Mills (Eds.)

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Workshop Theme 5: Enabling governance, policy and institutions

Workshop 5.1: Developing agricultural advisory systems for innovation: governance and innovative practices

Convenors: Ruth Nettle, Guy Faure, Laurens Klerkx, Margaret Ayre and Barbara King

The shift in paradigm from "technology transfer" to "agricultural Innovation systems" is represented in part by the re-organisation of traditional agricultural research, development and extension in many countries toward co-ordination and co-operation of stakeholders in forming trans-disciplinary groups to progress desired outcomes for farmers, localities or society. The transformation of existing roles and emergence of new roles of agricultural advisers (whether public or private advisers) within these new configurations has been a common theme for research within the IFSA community. Many countries have reported increasing privatisation of agricultural extension and advisory services and the emergence of "pluralistic" agricultural extension and advisory systems in which public, private and industry service groups need to increasingly co-operate and co-ordinate their approaches. With this, researchers have noted emerging issues and challenges to be:

- the governance and funding models to support strong advisory networks;
- the different levels of interest or engagement from the private sector in linking with research or linking more strongly into innovation networks;
- establishing new systems for maintaining and growing advisory skills and capacity;
- cohesion in advisory methods and use of tools.

This workshop aimed to progress these issues and challenges through papers and discussion focused on the following questions:

- What is the motivation for the private agricultural services sector to provide their services in the context of a broader agricultural innovation system?
- How are private providers currently encouraged to actively engage in the agricultural innovation system and complement other players?
- What are the range of practices and roles that advisors perform in the AIS?
- What are the key (AIS) governance practices that support the capacity of the private sector?
- What are the range of effective models for maintaining and growing advisory capacity?
- To what extent are latest generation ICT applications (social media, precision agriculture, BigData, internet of things) transforming private agriculture service provision at both the demand and the supply side?
- To what extent are the various advisory service providers coordinating their actions, competing or providing complementary services?
- To what extent is internationalisation of advisory work occurring, and what are its effects?
- How do farmers perceive and assess the quality and value from the advisory system?
- How are advisory systems in agricultural innovation being governed (policy, critical success factors, remaining issues)?

- What are the range of impacts being reported from shifts in advisory systems (public, private, pluralistic), both positive and negative, on issues such as attention for marginal groups, paying attention to public goods such as environmental care?
- What are the factors that need to be considered with respect to engaging private sector advisers within agricultural innovation systems (e.g. issues such as competition, possibilities of biased advice)?
- The workshop organisers sought papers that reflected critical and/or comparative analysis of case studies/examples of research or projects in different countries and contexts that progress these questions/areas.

Setting up an innovation network: public and private sector collaboration to solve pasture performance issues in the New Zealand dairy industry

Brazendale, R.[1], and Rijswijk, K.[2]

[1] *DairyNZ, Massey University, New Zealand*

[2] *Wageningen University, The Netherlands*

Abstract: Dairy farmers in the northern regions of New Zealand expressed widespread dissatisfaction with the performance and persistence of their pastures following drought conditions in 2007/08. Farmers were becoming disillusioned with the practice of renewing pasture as a means to introduce modern perennial ryegrass cultivars in their paddocks. This paper describes the formation and operation of an innovation network, consisting of private and public sector actors, that was formed in 2010 to improve the quality and consistency of advice provided to farmers. All parties sought to restore farmers' confidence in pasture renewal and modern cultivars, and critically, commercial interests were set aside. A series of activities were coordinated by this group from 2010 up to this date. Data is presented that describes the interactions between actors and the impact of this innovation network in addressing pasture performance issues. Critical success factors for the group are discussed and how this network has adapted over time is also described. Results to date suggest this innovation network has been effective in addressing pasture performance issues. A broad range of stakeholders, agreeing a shared vision amongst stakeholders, having clear roles and responsibilities, and a supported governance structure were critical success factors for this innovation network. These results have been influential within DairyNZ, an industry good organisation for New Zealand dairy farmers, in providing evidence that collaborative approaches are effective and consequently are being applied more widely in the New Zealand dairy industry.

Keywords: Pasture renewal, innovation network, critical success factors, public sector actors, private sector actors, dairy farmers

Introduction

In the 1980s the Government of New Zealand undertook a broad programme of de-regulation of the agricultural industry starting with the removal of subsidies, and continued with progressive changes in the public sector servicing agriculture. This resulted in the commercialisation and privatisation of its agricultural extension services, which up until then had been public good, and thus resulted in the separation of research and extension (Botha et al., 2006; Morriss et al., 2006). The fragmentation of extension services increased further as a result of legislative reforms of Producer Board powers and industry structures between 1999 and 2001 (Morriss et al., 2006; Turner et al., 2013). Today extension services are provided by commercial company representatives, various industry good bodies, rural advisors and local government, as well as various research institutes and funding mechanisms (Botha et al., 2006; Morriss et al., 2006; McEntee, 2010).

A survey of agricultural technology transfer services by the Ministry for Primary Industries (2012) in New Zealand highlighted the fragmented nature of support for technology uptake. The survey also identified that *"the number of people involved in technology transfer appears insufficient to provide effective support across the primary industries. There is a need to improve the connectivity between the people involved; ensure those involved are highly skilled; attract more people into the profession; and stimulate the demand for professional services if New Zealand is to achieve its goals around economic development and environmental performance."* (MPI, 2012 p.19) More specifically for the dairy industry, the knowledge exchange and services depend on a few public and industry organisations (Hartwich & Negro, 2010).

Against this backdrop of fragmented extension services the dairy farmers in the northern regions of New Zealand expressed widespread dissatisfaction with the performance and persistence of their pastures following drought conditions in 2007 and 2008 (Peoples, 2011; Kelly et al., 2011). Farmers had become disillusioned with the practice of renewing pasture as a means to introduce modern perennial ryegrass cultivars in their paddocks. The widespread failure of pastures was mainly attributed (by technical experts) to inappropriate management of pastures during dry conditions and incorrect choice of endophyte to protect ryegrass plants against insect damage (Kerr, 2011).

As the industry good organisation for New Zealand dairy farmers, DairyNZ sought to address pasture persistence and performance issues using a collaborative approach consisting of key public and private actors related to pasture renewal, rather than direct communication with dairy farmers through DairyNZ's consulting officers, which would mean working in isolation. A pan-industry group called the Pasture Renewal Leadership Group (PRLG) was formed in 2010 with representation from all components of the pasture renewal process, such as researchers, seed breeders, seed retailers, agricultural contractors, and farmers. Following a review in 2014, the name of the group was changed to the Pasture Improvement Leadership Group (PILG), and will be called the PILG throughout this paper. The PILG is led by DairyNZ who fund researchers and developers to attend meetings and complete work arising from PILG activity. Individuals representing commercial businesses attend meetings at their employers' cost and make their contribution in kind. DairyNZ organises and chairs meetings and takes responsibility for any follow up actions agreed at the meetings (including those assigned to other businesses represented within the group). The group meets 3-4 times per year with an agenda circulated pre-meeting.

The PILG aims to restore dairy farmers' confidence and competence in the practice of renewing pasture by ensuring evidence based messages are communicated consistently to dairy farmers. The role of the members of the PILG is thus to represent their sector, not their company, and commercial interest must be set aside. The messages from PILG are therefore focused on 'how to do pasture renewal', instead of 'why do pasture renewal', as the latter would link more closely with commercial incentives of some members and potentially become a source of conflict. Thus the function of the group is to agree collectively what those messages should be and then for the respective organisations to communicate them through their already well established channels.

At the outset of the PILG formation, gaps in resources and forums for communication were identified, and the PILG led initiatives to fill these gaps under the DairyNZ umbrella. This included the development of a pasture scoring scale, as well as an annual pasture competition. The latter was considered an important forum for messaging, and to celebrate farmers who were successful in renewing pastures, in that way boosting the confidence and competence of farmers.

The aim of this paper is to describe the formation of an innovation network (Ekboir, 2012) and test whether the collaborative approach used has been effective in restoring farmers' confidence in pasture renewal. Survey results are presented that give insights into the different roles and perceptions of the actors involved and how the activities of the PILG have changed over time. Based on these results critical success factors for setting up an innovation network involving public and private sector actors are identified and discussed,

Methodology

As part of the formation of the PILG a social researcher was contracted to complete various research tasks at the request of the group, primarily the formal evaluation of the effectiveness of the PILG. The social researcher also led group reflections on the functioning and effectiveness of the group.

Throughout the life of the group, data have been collected to understand the different perspectives of each of the sectors of the pasture renewal industry. The primary sources of data used for this paper are surveys, reflections of group members, as well as formal notes of the PILG meetings.

The chosen mechanism for data gathering was surveys in order to evaluate the effectiveness of the group. These surveys were available both online and in hard-copy. The reason for choosing surveys was the ability to reach a large number of potential respondents in a short amount of time and with a wide geographical area (Kumar, 2014). The respondents were identified through various methods, for example using the DairyNZ database to identify dairy farmers in the Northern regions of New Zealand, or using the PILG's network, as well as the internet, to identify seed retailers and agricultural contractors. However, one limitation of surveys is the risk of self-selecting bias as not everyone returns the survey and farmer surveys largely attract a certain type of respondent, namely older male farmers with a large amount of experience who also own the property. The inability to clarify questions, give spontaneous responses, and low response rates are further limitations of surveys (Kumar, 2014). The former two were addressed by having very clear questions and where relevant an 'other' option was included allowing respondents to fill in their own views. The latter was addressed to some extent by awarding a relevant prize amongst the respondents.

The surveys included a combination of written responses and Likert scale "tick-boxes" measuring agreement with a range of statements. Once completed, the results of the survey were entered into an excel spreadsheet. Responses to Likert scale questions were added up and divided by the number of respondents thereby generating mean scores. Responses to individual written questions were tabulated, and then subjected to a process of thematic coding by the researcher. For an overview of the gathered data since the formation of the PILG see Table 1.

Table 1. Overview of gathered data

Target group	Method	Year	Number of respondents
Dairy Farmers in the Northern regions of New Zealand	Survey	2010	776
PILG members	Survey	2012	12
Seed retailers	Survey	2012	42
Agricultural contractors	Survey	2013	34
PILG members	Interviews	2014	12
Dairy farmers in the Northern regions of New Zealand	Survey	2015	376

The 2010 farmer survey provided baseline data that was used to assist PILG members to understand pasture renewal issues and focus the PILG's activity on farmer needs (Kelly & Smith, 2010). This survey also provided a benchmark to evaluate impact, comparing it to the findings from following surveys such as the 2015 farmer survey.

Three non-farmer surveys were undertaken to assess the impact of the PILG initiative at an industry level. The first of these assessed the perceived value of the PILG group from the perspective of the group's members (Kelly & Mackay, 2012). A second survey looked at the transfer of information from the PILG through the supply chain, especially focusing on seed retailers (Kelly, 2012). The third survey involved an assessment of contractors in the Waikato and Bay of Plenty regions to improve the PILG's understanding of the practices around pasture persistence and performance, associated issues such as black beetle, and the role contractors have in providing advice to farmers in support of their renewal activities (Rijswijk et al., 2013). In 2014 the PILG members were interviewed in order to identify enablers and barriers to communication both internally as well as externally. This information was used as input for a strategic communication plan to increase the impact of the then renamed PILG (Rijswijk, 2014).

Results

Key results from each of the surveys are reported here to document perspectives from different stakeholder groups. The survey results were presented during the PILG meeting after which its members discussed the implications of these results for the direction and focus of the group's activities. The outcomes of those discussions were recorded in the meeting notes. The result section below therefore shows an overview of the survey results related to the role and perceptions of the surveyed groups, as well as the outcomes of the PILG discussions.

Farmer Survey 2010

The farmer survey of 2010 (Kelly & Smith, 2010) provided information which would inform the focus and the direction of the PILG, as well as a baseline to enable evaluation of the impact of interventions. The survey showed *"that farmers were, on average, less confident in selecting suitable cultivars and endophytes, and more confident in making decisions 'on-farm', including the selection of seed bed preparation techniques and appropriate management techniques both in the establishment phase and in grazing management."* (Kelly & Smith, 2010 p.9).

The survey also identified that farm consultants, seed retailers and researchers or scientists were the most useful information sources to farmers with regards to pasture renewal information. However, independent organisations such as DairyNZ were not considered important sources of advice for farmers when it came to pasture renewal practices. The survey report concluded that "commercial imperatives conflicted with consistent advice to farmers" where those who provided the advice gained from sale of their propriety products, and that there was a lack of consistent, precise and up-to-date information across the industry (Kelly & Smith, 2010 p.16). This led to farmers returning to traditional 'old' methods (Peoples, 2011), particularly in their choice of cultivar and endophyte. For the PILG the survey outcomes confirmed the group's expectations of the lack of confidence in the practice of renewing pasture, and the need for evidence-based messages not related to company brands. These findings are consistent with previous research that found farmers relied on commercial seed sellers as their primary source of advice about pasture renewal practices (Peoples, 2011).

Seed Retailer Survey

A survey of seed retailers was completed in 2012 to assess their involvement in providing farmers with advice in pasture renewal, their own confidence and satisfaction with information sources, and what they saw as key emerging issues for pasture renewal and persistence (Kelly, 2012).This survey found that seed retailers were confident in advising on pasture renewal practice relating to technical information about seed selection and management (Figure 1). These results can be usefully compared to similar questions in the farmer survey, where farmers were more confident in making on-farm decisions than making decisions relating to cultivar and endophyte choice (see Kelly & Smith, 2010). This suggests complimentary decision-making between these two groups. The survey also found that seed retailers rated seed suppliers as the most important sources of information when it came to accessing information on pasture renewal (Figure 2). These survey findings confirmed the importance of this communication channel and led to seed retailer representation on the PILG from 2012 onwards. Seed retailers were also invited to take part directly in pasture competitions and were asked to encourage their clients to enter these competitions.

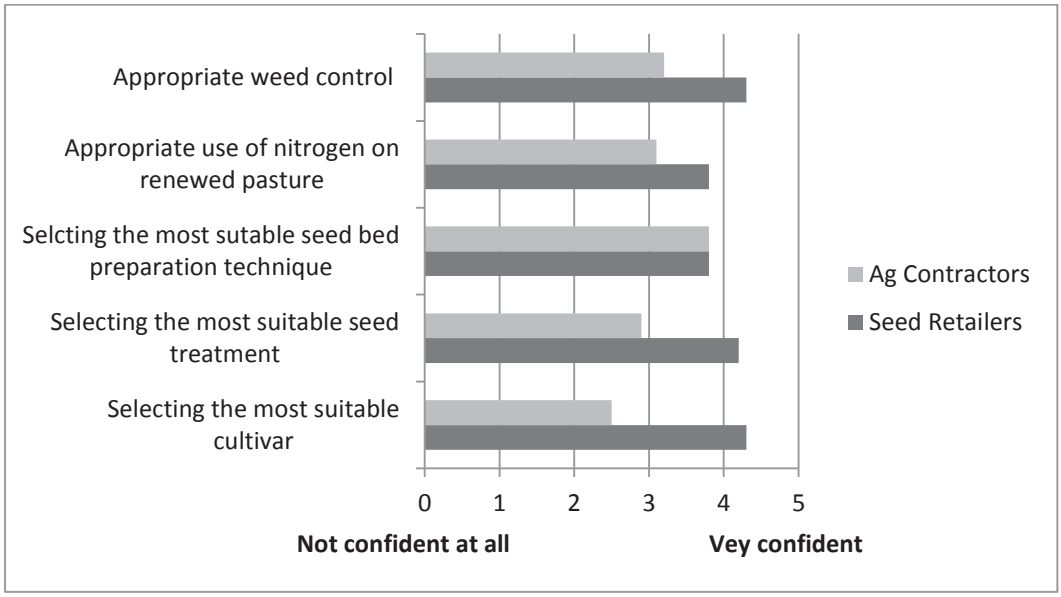

Figure 1. Confidence levels of seed retailers (Kelly, 2012) and agricultural contractors (Rijswijk et al., 2013) in providing pasture renewal information

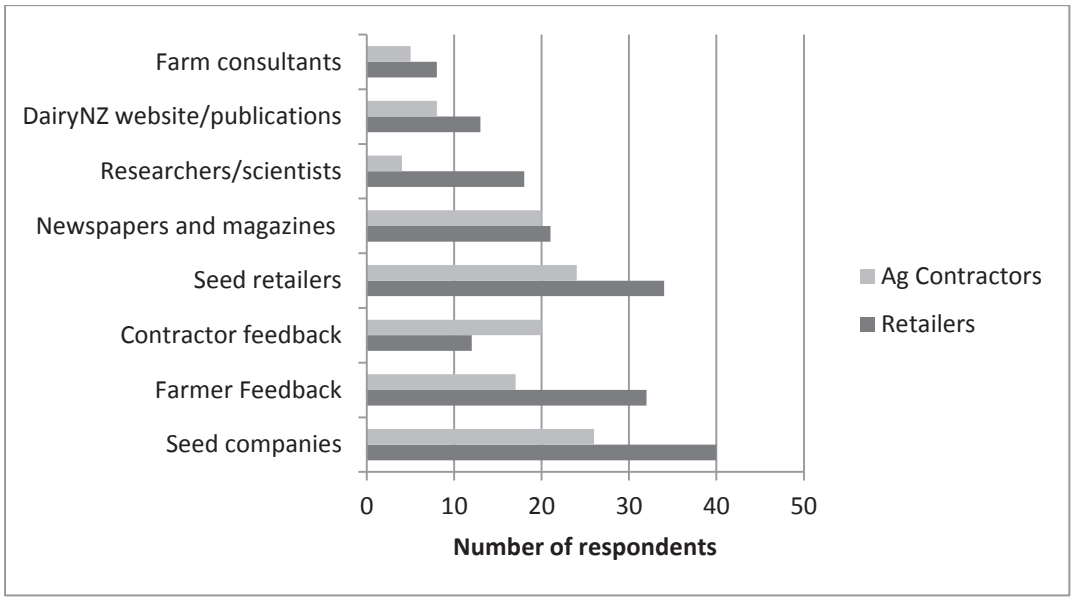

Figure 2. Information sources used by seed retailers (Kelly, 2012) and agricultural contractors (Rijswijk et al., 2013)

Agricultural Contractor Survey

As part of the agricultural contractor survey in 2013 (Rijswijk et al., 2013) the contractors were also asked how confident they were in answering farmers' questions about a range of aspects of pasture renewal. Figure 1 shows the distribution of the different confidence levels amongst contractors. Agricultural contractors were most confident answering questions about on-farm topics that relate to their everyday practices and with which they are familiar. Conversely, they had low confidence or very low confidence in answering farmers' questions about cultivar and endophyte selection. Contractors seem to be less familiar with topics that require scientific knowledge of seed specifics as these topics are removed from what they do every day as part of their businesses.

In comparison, the seed retailer survey showed that seed retailers are more confident providing this scientific information than making the on-farm decisions (Kelly, 2012). The contractors and seed retailers complement each other in providing advice and helping farmers with decision-making about pasture renewal. However, the farmer survey (Kelly & Smith, 2010) showed that farmers are confident making decisions about the same topics which the contractors are confident in providing advice about.

The two most often used information sources were seed companies or seed retailers (Figure 2). More than 50% of the respondents also talked to other contractors and farmers to get feedback and information on pasture renewal, and used articles in farming newspapers and magazines as information sources. As a result of this survey the PILG directly engaged with the Rural Contractors Association and has become a regular contributor to their members' magazine. In 2013, the PILG was invited to be a key note speaker at the association's annual conference.

PILG member survey and interviews

As part of an ongoing evaluation of the effectiveness of the PILG, members were surveyed in 2012 (Kelly & Mackay, 2012). PILG members were asked to indicate their level of agreement with each of a number of statements, as presented in Figure 3.

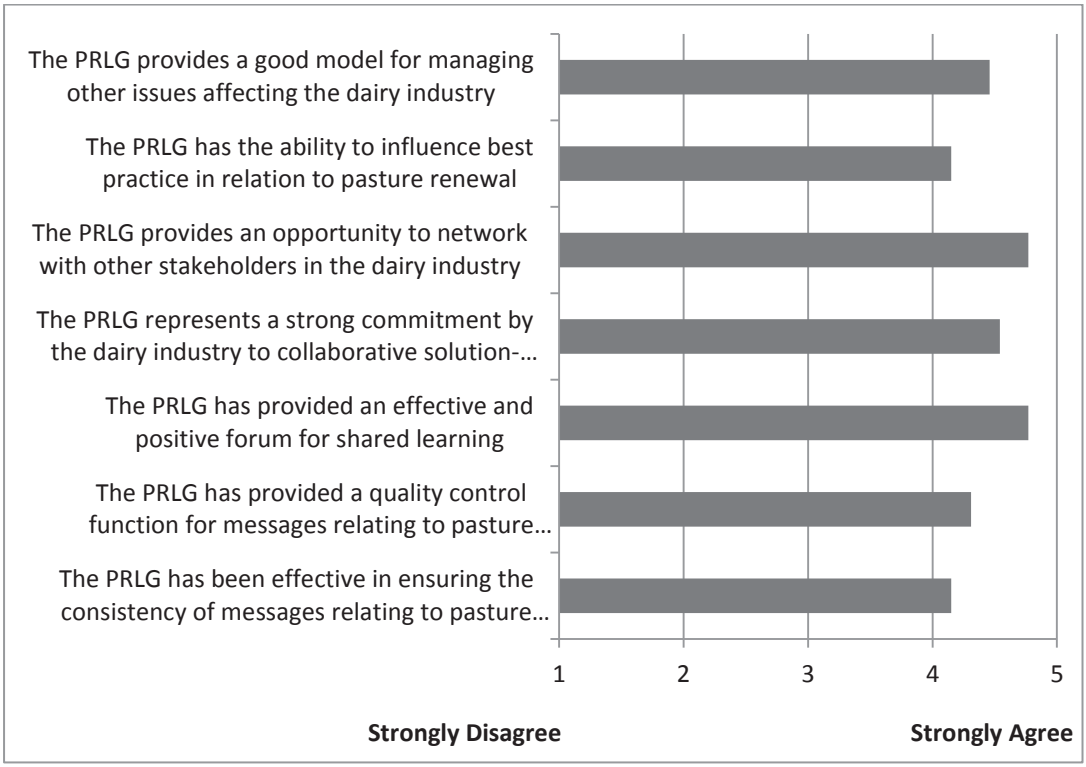

Figure 3. Level of agreement with statements by PILG members (Kelly & Mackay, 2012)

Based on a calculation of average scores, there was agreement to strong agreement with all of the statements presented. There was particularly strong agreement with the notion that the group was a positive forum for shared learning and an excellent platform for stakeholder networking. These two factors are largely responsible for members' enjoyment and satisfaction of involvement (Kelly & Mackay, 2012).

The three relatively lowest scoring statements (although agreement was expressed for all of them), were related to the development of consistent messages relating to pasture renewal, the role of the group in providing a quality control function for such messages, and the ability to influence best practice. These results reflect many of the challenges identified in transferring technical data into useful information for on-farm decision-making (Kelly & Mackay, 2012). Despite these technical difficulties, there was strong agreement that the PILG innovation network represented a good model for addressing issues affecting the dairy industry.

In 2014 the members were again asked to assess the group's impact and effectiveness through a set of interviews that focused on the communication, between group members and their respective organisations, and between the group and its intended audience of dairy farmers and other external parties. Group members commented that they really valued the variety of members, but that the commercial versus science debate was still very much present within the group (Rijswijk, 2014), for example in relation to deciding on sowing rates. Public sector scientists argued that seeding rates could be safely reduced without detriment to

pasture performance, and may in fact improve pasture persistence (see also Lee, 2013). Private sector seed suppliers saw this as a threat to seed sale volumes and argued that low seeding rates were risky because farmer establishment practices, such as seed bed preparation and weed control, were sub-optimum, and high seeding rates compensated for these poor practices. Seed retailers also believed there were no detrimental effects of high seeding rates apart from extra seed costs and therefore they were 'better to err on the side of caution'.

The members had various views on the communication from the PILG with their own organisations, depending on the size of the organisation as well as resource availability. All members agreed to make a greater effort to communicate the messages from the group internally within their organisations (Rijswijk, 2014). Commercial actors within the PILG agreed to take greater ownership for the output from the group, and share the workload carried largely by DairyNZ up to this time. This was both relevant for the communication towards their respective organisations, as well as the external communication of the PILG (see below).

The main conclusion regarding the external communication was that it had been sufficient, according to the group members, up until that point, but that greater impact could be achieved if the communication was more structured and would reach a wider audience (Rijswijk, 2014). The group therefore decided to create a communication strategy and hire someone to manage the daily business of the group and its communications. As a result of feedback from PILG members the purpose of the PILG was extended beyond a focus on pasture renewal practices to the management of pasture for improved persistence and performance. The group also felt that this topic was relevant beyond the Northern regions of New Zealand and started to target other regions in their messaging as well.

Connections between survey results

In 2013, the survey data collected by the PILG were brought together by Rijswijk (2013a), along with a farm consultant survey completed by Payne et al. (2010) and an independent farmer survey (Peoples, 2011). Figure 4 shows the main information sources used by each of the surveyed groups. The black boxes represent the surveyed groups. The line thickness represents the frequency of the connection for that particular group, i.e. thicker lines represent greater frequency. This figure shows farm consultants and researchers are key influencers of confident farmers. Seed companies are key influencer of both seed retailers and contractors. The indirect influence of the PILG (in the figure labelled as PRLG) is shown with lines to these key influencers. Hence, the line between the PILG and farmers is not heavy and DairyNZ, the catalyst of the PILG, was not a frequently used source of information by farmers in pasture renewal matters.

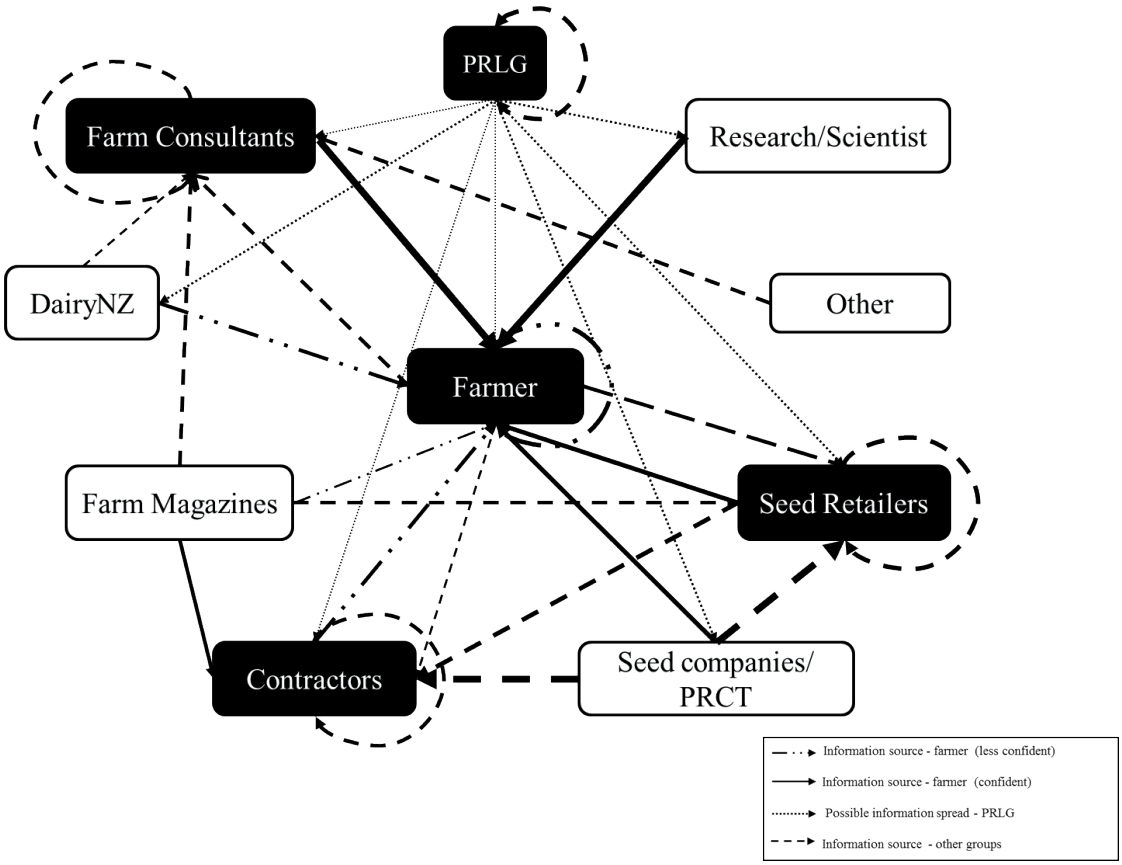

Figure 4. Information flows within the pasture renewal industry (Rijswijk, 2013a)

Farmer Survey 2015

The farmer survey of 2010 was repeated in 2015 to assess any changes in farmer attitudes to pasture renewal and their confidence in practices in pasture renewal (Rijswijk & Rhodes, 2015). The respondents indicated this time that they had more confidence in selecting the most suitable cultivars and endophytes, however, their confidence in undertaking appropriate management of their pastures had decreased a little. The information sources that were valued most by dairy farmers remained largely the same as in 2010, however, seed retailers had become the most useful source of information for the farmers instead of farm consultants (Rijswijk & Rhodes, 2015). The 2015 survey data also showed that farmers used a wide range of information sources when it came to making pasture renewal decisions (Rijswijk & Rhodes, 2015). Based on this information the PILG recognised the need to more broadly engage with other associated organisations. Organisations such as New Zealand Institute of Primary Industries Management, which is the professional body for agricultural professionals, became a particular group of focus.

To measure change over time respondents were asked to rank their level of agreement with three statements. A scale from 1 to 5 was used going from 'strongly disagree' to 'strongly agree' with a 'not applicable' option, if appropriate. The first statement was: 'compared to 2010 there is now better information available about pasture renewal'. A total of 326 respondents answered this question, although the most selected option was neutral (37%), a total of 54% of respondents either agreed or strongly agreed, as shown in Figure 5 below (Rijswijk & Rhodes, 2015).

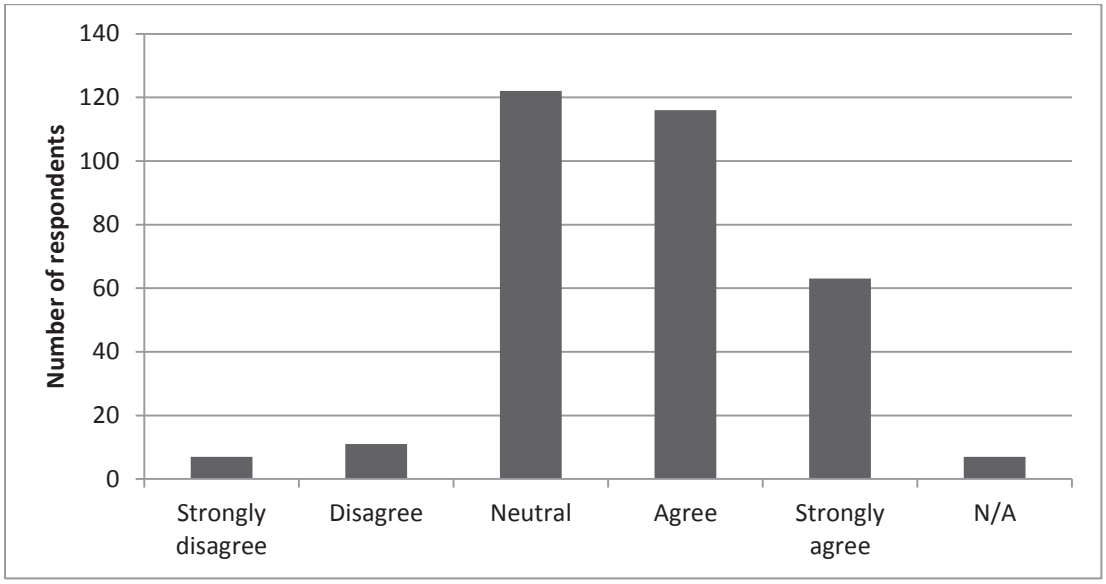

Figure 5. Level of agreement with the statement: compared to 2010, there is now better information available about pasture renewal (n = 326) (Rijswijk & Rhodes, 2015)

The second statement was: 'compared to 2010, the messages about pasture renewal are more consistent across the industry'. Responses are shown in Figure 6. Again, the most widely given response was neutral (43% of 326 respondents), but as with statement one, 49% agreed or strongly agreed with this statement. This suggests that not only is there better information available, but also that the information itself is captured in a more consistent way across the industry.

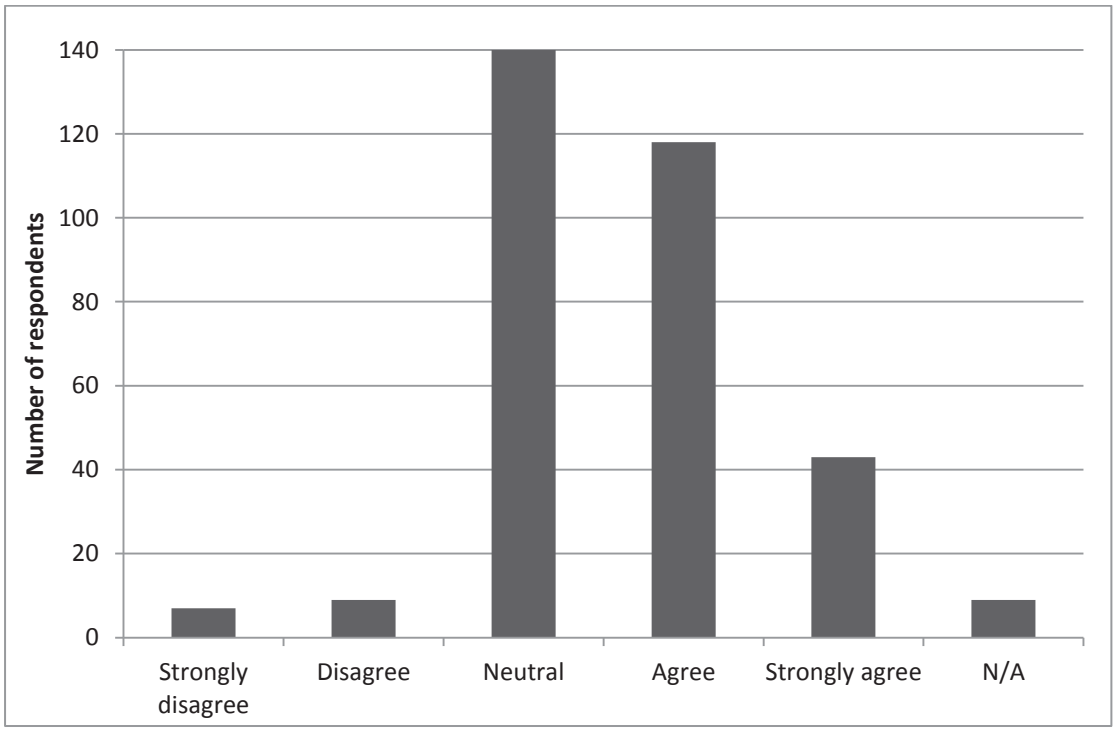

Figure 6. Level of agreement with the statement: compared to 2010, the messages about pasture renewal are more consistent across the industry (n =326) (Rijswijk & Rhodes, 2015)

The third and last statement was: compared to 2010, I have made significant changes in how I renew my pastures (Figure 7). Similar to the first two statements, there was a tendency to respond to the neutral, 36% of 323 respondents. However, for this statement the remaining replies were more evenly spread, those that agreed or strongly agreed with this statement accounting for another 36%, but 22% either disagreed or strongly disagreed.

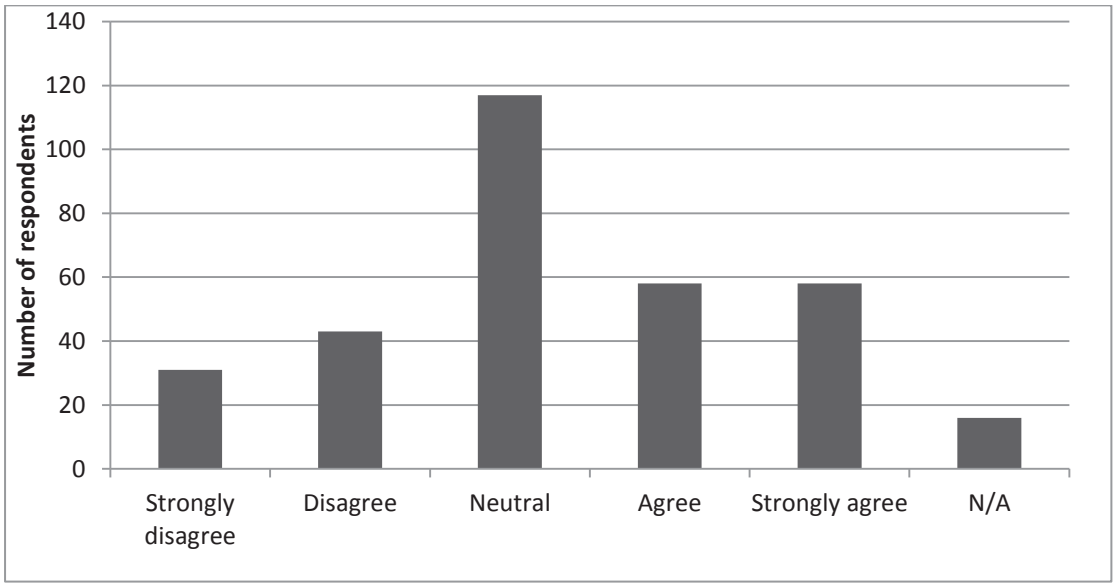

Figure 7. Level of agreement with the statement: compared to 2010, I have made significant changes in how I renew my pastures (n = 323) (Rijswijk & Rhodes, 2015)

Overall it was concluded that the aim of the PILG to ensure consistent messages relating to pasture renewal had certainly been met, with dairy farmers being more confident in their pasture renewal practices, the improvement of availability of information and increased consistency of the messages across the industry.

Discussion

The results report the activities of the PILG over the past 5 years and assess the impact of the group. Despite the 2015 farmer survey showing that the aim of restoring dairy farmers' confidence and competence in pasture renewal, through providing consistent and correct industry wide messaging has been met, it does not mean that this achievement was not without its challenges. This section will discuss the critical success factors for setting up an innovation network which Ekboir (2012) describes as "*a diverse group of agents who voluntarily contribute knowledge and other resources to jointly develop or improve a social or economic process or product"*. Innovation networks are a special form of organisation with a non-hierarchical structure, a collaboration-based culture and consensus-based coordination (because members are free to leave the network at any time).

The PILG was set up as an innovation network and formed in response to farmer dissatisfaction with the performance of pasture. There was widespread concern within the seed industry that farmers were losing confidence in their product and poor pasture persistence was being linked to modern cultivars (Kelly et al., *2011;* Peoples, 2011). This emerging crisis of confidence provided the first critical success factor, namely a sense of

urgency for action and willingness of competing commercial interests to work together to find solutions for the industry. Further, at the first meeting held in August 2010, a shared vision was agreed amongst group members: “to restore dairy farmers’ confidence and competence in pasture renewal”. This shared vision proved to be very important to the ongoing function of the group as it provided common focus and ownership amongst group members.

A third success factor in the set-up of the PILG was the representation of all actors in the pasture renewal process. This was important because messages were agreed that were workable for all sectors, not just selected components. This reduced the likelihood of messages communicated from public sector actors being in conflict with private sector actors. At the time of forming this innovation network such an approach was novel for DairyNZ. Since its formation this has become a more common approach where DairyNZ acts as a catalytic agent to effect change for the benefit of dairy farmers.

At the outset of the group the roles and expectations of actors were clearly articulated. Individuals were there to represent their sector not their company and commercial interest must be set aside. This proved to be the fourth success factor, as group members were required to agree on key messages for farmers about pasture renewal. Once these key messages were agreed all organisations directly involved (commercial and non-commercial) and associated organisations would communicate these messages through their own commercial channels. Despite these agreements tensions in the group sometimes occurred, often related to differences between commercial and science perspectives, such as the seeding rates issue mentioned above. This conflict was resolved in the short term by referring to an agreed key principle; that the group should be evidence-based. The outcome was a position statement (PILG, 2014) agreed by the group, while a trial was conducted to test the effect of seeding rate on pasture persistence. Interestingly, the trial found that seeding rate did not affect persistence and concurred with seed retailers’ beliefs.

Another success factor was governance of the PILG, which is fulfilled by DairyNZ, who prepares the agenda and chairs the meetings. The impartiality of DairyNZ appears to be important to group members, Chair options have been considered by the group but continuing with DairyNZ in this role has been the unanimous decision. Furthermore, members believed that under DairyNZ leadership the PILG had greater credibility amongst farmers compared with other commercially driven groups. Also, the involvement of a social researcher in the PILG is important to its success, as the social researcher provided discipline to group reflection and ongoing evaluation of the group’s effectiveness. Attendance at meetings provided context and understanding when carrying out survey work on behalf of the group.

An example of this ongoing evaluation is the information flow within the pasture renewal industry which was collated from survey data and depicted in Figure 7 (Rijswijk, 2013a). This diagram was presented to the PILG and led to discussions within the group on whether or not the PILG should have its own brand and communication channel. Initially the communication model was set up to be indirect, using member organisations’ communication channels, with the PILG deliberately having low brand awareness amongst farmers for several reasons: i) the group did not want to add to the confusion of farmers by creating yet another source of information; ii) it would be a considerable investment of time and money to do this properly; iii) previous research and subsequent survey work conducted by PILG confirmed that organisations’ actors represented already had very well established communication channels

that were recognised by farmers and other stakeholders; iv) because the group was newly established, using a relatively new approach in 2010 to deal with this communication problem around pasture renewal, it was uncertain whether this approach would work; and v) the credibility of the group, despite being led by DairyNZ, was uncertain. Even though some of these initial reasons were less relevant in 2013 the group decided that it would continue in the same way, without having a brand or a separate communication channel. The appearance of messages and resources developed by the PILG in commercial publications (such as Klingender, 2016) provides some evidence that the communication model is working as do the 2015 survey results (Rijswijk & Rhodes, 2015)

Following the 2013 review the earlier mentioned communication strategy (Rijswijk, 2014) was set up, which in turn resulted in associated organisations being identified that could extend messages on behalf of PILG, despite not being directly involved in the PILG. These organisations included other seed companies and New Zealand Institute of Primary Industries, the professional body representing agricultural professionals, including farm consultants.

The 2015 farmer survey data above suggests that this communication strategy is working. Farmers are more confident about pasture renewal and believe information sources are more consistent. While not all this progress can be attributed to the PILG alone it at least provides some confidence that the outcomes sought are being realised. Moreover it is a good indication that the formation of this innovation network was successful, as the structure is very much appreciated by its members, while also achieving the impact they were after.

Conclusion

The 2015 farmer survey found that farmers' confidence in pasture renewal had increased and provides some evidence that the PILG is having the desired impact. The appearance of messages and resources developed by the PILG in commercial publications gives some confidence that the communication model is working.

Significant opportunities exist to improve the effectiveness of the PILG further through the influence of farm consultants who are a primary source of information for farmers (Peoples, 2011; Rijswijk, 2013b). Furthermore *"targeted messages to contractors and seed retailers would enhance their knowledge of pasture renewal practices, thus improve their confidence levels in both practical and scientific aspects of pasture renewal, and enable them to give better advice to farmers."* (Rijswijk, 2013b p.224).

The set-up of the PILG proves that public and private actors can work together effectively to form an innovation network, provided that there is: i) a sense of urgency and willingness to work together; ii) a broad representation of the involved or affected stakeholders; iii) the members share a common vision; iv) members are able to put commercial interests aside; v) have a clear view of their roles and responsibilities; vi) there is a accepted governance structure; and vii) regularly reflect on their effectiveness. This network was formed in response to farmer dissatisfaction with their pastures and commercial actors recognised this threat to their future product sales. The absence of formal organisational arrangements from their own companies means that the group has had sufficient flexibility to adapt over time and broaden its scope beyond pasture renewal to pasture performance and indeed change its name to reflect this change.

Data collected to date suggest this innovation network has been effective in increasing confidence amongst farmers around pasture performance issues through collaboration between private and public sector actors. These results have been influential within DairyNZ in providing evidence that collaborative approaches are effective and consequently are being applied more widely in the New Zealand dairy industry to address complex issues, such as the industry's impact on water quality.

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Privatisation of agricultural advisory services and consequences for the dairy farmers in the Mantaro Valley, Peru

Faure, G.[1], Huamanyauri, M.K.[2], Salazar, I.[2], Gómez, C.[2], de Nys, E.[3] and Dulcire, M.[1]

[1]*CIRAD, UMR Innovation*

[2]*Universidad Nacional Agraria La Molina (UNALM)*

[3]*World Bank, Depart. Latin America and Caribbean Region*

Abstract: The private sector's presence in agricultural advisory services worldwide has been on the increase for over three decades. This trend has also been observed in the Mantaro Valley (Peru), in a context of dairy family farming. The objective of the communication is to analyse the modalities of advisory services privatisation and assess the consequences of this privatisation for the farmers and their livestock systems. Data were collected through input suppliers, different types of advisers and producers' interviews. The activity of private advisers is most often associated with the sale of livestock inputs, which, while facilitating access to technical support for almost all producers, does not take the overall producer needs into account. This study shows the importance of improved coordination of advisory activities between public and private actors for an efficient agricultural advisory system, a condition that encourages a sustainable farming system approach.

Keywords: Agricultural advice, dairy sector, family farming, Peru, private advisory services, sustainability.

Introduction: the withdrawal of the public agricultural advisory services

The withdrawal of the State since the 1980s is at the core of discussions on reforms of agricultural advisory services the world over (Berdegué, 2002; Faure et al., 2011). This withdrawal can take different forms, as notes Rivera (2000): (i) the decentralisation of publicly funded services to the regional level; (ii) the transfer of State-provided services to private companies; (iii) the commercialisation of services by public institutions with the State and producers sharing the costs; and (iv) full privatisation. Given this diversity of situations arising from the withdrawal of publically funded agricultural advisory services, privatisation is seen by most international organisations as a remedy or improvement. The privatisation of advisory services could be seen as a means of transferring costs to the final beneficiaries. Thus Anderson and Feder (2004) assume that an advisory system can be improved in countries which have difficulties in funding public services when it is based on a decentralised organisation and private providers. Private sector entities, including suppliers of inputs and agricultural equipment, are increasingly providing advisory services in order to promote their business activities. However, few studies have focused on the relevance of their strategies and advisory practices. Mirani et al. (2007) in Pakistan, Klerkx and Jansen (2010) in Netherlands, and Goulet (2011) in France show that quality advisory services can be provided if investments are made in human resources to train advisers. Hence, some private advisory systems, based on commercial relationships between customers and suppliers, have been proven to work in the case of intensive agriculture in industrialised countries (Kidd et al., 2000).

However, several studies also point to the risks of privatisation (Kidd et al., 2000; Labarthe, 2005; Klerkx et al., 2006), such as: the limited dissemination of complex innovations; lower consideration of environmental issues or of the complexity of the production system; specialisation in advisory topics to improve the marketing of services; preference for technology transfers with little training of producers; risk of discontinuity in service provision due to changes in funding mechanisms; reduction in exchanges of information between farmers, who do not want to share their 'purchased' knowledge; and, finally, the exclusion generated by the inability of some farmers to purchase advisory services. In general, it is accepted that the majority of farmers, and not just those in developing countries, cannot afford the cost of these services by themselves (Klerkx et al., 2006; Labarthe et al., 2013). When we accept the role of these private services and the producers' difficulties in paying for them, the debate turns to possible funding alternatives. Indeed, it is possible to combine the provision of an advisory service by a private and/or public provider with private and/or public funding (Birner et al., 2009). This public-private partnership (Christoplos, 2010) can be an opportunity to impart more flexibility to the system of advisory services.

Setting up an effective advisory private sector thus requires a rethinking of the State's role and of the relationship between public and private providers. Some authors (Anderson & Feder, 2004; Kidd et al., 2000) believe that the State should continue to play a role in disadvantaged areas and for poor farmers. Others point out that the transition towards a privatised system is not straightforward (Rivera & Zijp, 2002), and requires: a clarification of the roles of each institution; economic opportunities for funding advisory services; service providers with the right skills; and farmers able to articulate clear demands. Finally, privatisation implies that the State develops new functions to guarantee a coherent system of support by ensuring that public interests are safeguarded and by regulating relationships between actors (Labarthe, 2005; Klerkx et al., 2009). To this end, public policies must encourage the qualitative development of advisory services towards 'innovative networks' fostering the interactions between various rural actors (farmers, suppliers, advisers, industrialists, politicians, researchers, etc.) in order to produce both knowledge and learning useful for actions (Dulcire, 2014). However, not all governments have the necessary financial and human resources – or even the political will – to do so. To limit these risks, advisory services were once again strengthened with public funds, funding public and/or private advisory services in some Latin American countries during the first decade of the 21st century (Aguirre, 2012). But Peru was not one of them (ibid.). However, if the consequences of the gradual withdrawal of the State from agricultural advisory services in developing countries and the concomitant rise of the private services have been studied in some conditions, they need to be detailed especially for small farmers to facilitate the comparison for a learning approach. Research undertaken between 2010 and 2012 by the National Agrarian University of La Molina and the Centre for International Cooperation in Agronomic Research for Development (CIRAD) was aimed at strengthening smallholder dairy farmers in the Peruvian Andean region of the Mantaro Valley by in particular improving the advisory services. The geographical area is particularly relevant for this study because most producers are small and the private sector is playing an increasing role in advisory services, mainly based on a combination of providing advice and selling inputs.

The objective of the communication is to analyse the modalities of advisory services privatisation and assess the consequences of this privatisation for the farmers and their livestock systems. We analysed the impacts on the coverage of services for the various dairy

farmers, the adaptation and relevance of the content of the advice, the funding mechanisms, and the modes of coordination between actors. In our case we want to analyse to what extent privatisation leads to small farmers' exclusion and influences the type of farming system regarding the use of external inputs. The results of this work can be useful not only for local stakeholders and for policymakers at the national level to help improve the system, but also for research in other regions by enriching the analysis of the consequences of the privatisation of agricultural advisory services for small producers.

Methodology of the study

Choice of the study area

Family farming in the Mantaro Valley, located at more than 3000 metres above sea level, is characterised by dairy farming that forms part of various organised supply chains and three types of farm management: artisanal and family, small business, and industrial. Cortijo et al. (2010) also characterise dairy farms according to herd size: small with 3 cows or fewer, medium with between 4 and 10 cows, and large with between 11 and 100 cows. Milk is a strategic product for small local producers because of market stability and the diversity of marketing opportunities at attractive prices. These livestock farming systems are based on irrigated fodder plots and cows in stables. Farmers purchase inputs for their pastures (seed, fertiliser) and their livestock (feed concentrates, veterinary products) to improve their herd's milk production. Concepción province, one of the nine provinces that make up the department[1] of Junin, was chosen for this study because it is the province with the highest milk production in the valley. This department has 4500 cattle farms, with Concepción province alone having 1300, which produce 30% of the milk of the department (Dirección Regional de Agricultura de Junín, 2011).

Interviews with the actors

For this study, we decided to identify and compare the various public and private support and advisory services that were available to dairy producers in an effort to better understand these activities in the province. In a first stage, the different advisory services active in Concepción province (public institutions, NGOs, dairies, commercial firms selling inputs) were identified. Then, 35 semi-structured interviews (consisting of closed and open questions) were conducted with each supplier's manager and one or more technician(s) of its team in order to characterise the supplier's history, its area of intervention, the themes addressed by its advisory service, its activities, the funding mechanisms, the relations between the producers and the other actors, as well as their own representations of their own services.

In a second stage, a sample of 40 dairy farmers was constructed, keeping in mind that the requirement of services may vary depending on herd size (number of cows: 3 or fewer, 4 to 10, 11 to 20, 21 to 30, more than 30). These farmers were interviewed in order to typify their production systems, including the consumption of inputs, public or private technical support, and the evolution of these advisory services over the past decade in terms of the topics raised by advisers, the quality of the farmers' relationship with the advisers, the cost of the intervention, and the farmers' perception of the quality of services received. Finally, these data were processed to analyse the current state of Mantaro advisory services as regards: the services received by farmers according to the size of their herds; the services provided

[1] A department is an administrative division in Peru with its own regional government. Each department is divided into provinces, which are themselves sub-divided into districts.

depending on the type of service provider; the quality of these services as detected by the farmers; the cost and funding of these services; and the relationships between service providers and coordinating mechanisms (Huamanyauri, 2013).

To confirm the results, we triangulated these results with other studies conducted with the participation of some of this article's authors: the characterisation of production systems (Laporte et al., 2008); analysis of dairy farms and their relationships with processors (Cortijo et al., 2010); and analysis of the dairy sector in the Mantaro Valley (Gamboa, 2012). Finally, a workshop was organised in late 2012 with several actors from the valley's dairy sector (producers, technicians, service providers, dairy companies, commercial firms) to present the results, hold discussions and undertake group activities. This workshop allowed us to share, validate and refine these results. It also served to elaborate policy recommendations, with the participation of the actors, for improving the advisory system in the valley.

The privatisation of agricultural advisory services

The public agricultural extension system was established in Peru in 1942. It was reformed in the late 1980s, which allowed new actors, including private companies, to diversify their offerings. The advisory system in the Mantaro Valley has evolved rapidly since 2005, when the Peruvian government reduced the resources made available to the Agricultural Agencies[2] (AA) and transferred the advisory mandate to regional governments. At the same time, the market for inputs in the valley got a boost with the arrival of several commercial companies, which began promoting their products through dealers and technicians. Dairy product companies also began to provide advice to their milk suppliers. In addition, the NGOs left Concepción province to work with farmers in more disadvantaged areas at higher altitudes.

The gradual State withdrawal

Peru's Agricultural Agencies have played an historic role in disseminating technologies designed to increase agricultural productivity and production. Following budget cuts in the context of decentralisation, their role has now changed. They are now attempting, without much experience, to play a coordinating role between the different actors and institutions, by pushing for rural development and, especially, by strengthening agricultural production chains. On behalf of Peru's Ministry of Agriculture, Gutiérrez (2007) proposes a different approach, one with a redefined role of Agricultural Agencies for bolstering the capacity of regional and municipal governments to manage rural territories. Other public bodies and universities are disseminating agricultural information in the Mantaro Valley, thus supporting the development of innovation at farming systems level. Three public research institutes and two local universities have developed, in parallel to their main activities and through classroom training, practices to support farmers so that scientific knowledge about livestock rearing can be disseminated to them: genetic improvement, animal health, animal nutrition, management of pastures with improved varieties, etc. For this purpose, these institutions use their technicians, or students in the case of universities, or occasionally private contractors. In such a context, one can say that the State is certainly still present in the agricultural sector but in a limited way (Huamanyauri, 2013).

The most important point is that this decentralisation has encouraged in this department the

[2] *An Agricultural Agency is an entity of the Ministry of Agriculture in each department, providing agricultural advisory services.*

development of projects to support farmers, funded by the Regional Government of Junin department. But the short-term nature of such projects leads to the temporary recruitment of technicians and advisers, who have limited professional experience since new assistants are hired for each new project. Such a discontinuity in service provision is in line with the risks of privatisation mentioned above. Among these projects, the PROGALE project (genetic improvement programme and technical assistance for milk production) has hired 11 technicians who worked in 2012 with 250 dairy producers (6%) from various provinces of the department, including Concepción. However, the objectives of these regional projects are the same as those of the Agricultural Agency in the past. These projects focus solely on technical issues to increase productivity and production with advice on livestock farming and then on pasture management, animal feeding and herd management (infrastructure, hygiene) and animal health. To this end, the projects rely mainly on two tools: (i) training workshops based on a conference; and (ii) individual technical assistance based on an intervention programme developed each week on the basis of phone calls from producers. Since producers express little interest in the workshops, considering them too 'academic' and without any direct relevance to their farming conditions and practices, they are motivated to participate through access to individual services (technical assistance, insemination, on-the-spot sales of medicines at affordable prices, etc.).

The rise of different categories of private advisory service providers

In this context, several types of actors have taken advantage of the reduction in public assistance to offer technical support to the producers. These actors are private companies, NGOs and producer organisations. In the Mantaro Valley, NGOs are currently focusing their work on the highlands because the poverty there attracts international funding. Furthermore, the few producer organisations in the region are not very strong; they had been created by the Ministry of Agriculture to facilitate relations between producers and advisers. The most important and visible development in the valley is that of private advisory activities by commercial firms and individual technicians.

The growing role of commercial firms with embedding advisors

The commercial firms, selling medicines, feed concentrates and pasture seeds, provide information on the use of these inputs when the producer buys them. The largest firm in terms of sales volume began to arrive in the area in the 2000s, setting up their local headquarters in the main town, Huancayo, and often opening shops in the villages. The quality of information provided to the farmers depends on the level of training of the vendors or embedded advisors (Klerkx & Jansen, 2010), their time availability to provide information and their capacities to organise additional training for farmers through agreements with universities and companies selling these inputs. Of the seven commercial firms present, five employ technicians who go to the field for organising conferences for farmers and providing individual technical assistance, thus providing quality services for farmers. For example, Fertisol employs three people for product sales. They carry out field visits in Concepción district and between them provided services to 500 producers in 2012, 38% of the province's farmers. Even if the advice is oriented to the promotion of their products, competition exists between commercial firms and the quality of advice is a way to attract farmers and earn their loyalty.

The emergence of specialised advisors

There also exist private "specialised advisors" (Klerkx & Jansen, 2010) in the study area. They work neither for the public sector nor for commercial firms. We identified four categories:

veterinarians, livestock or agricultural engineers, agricultural technicians, and others (students, farmers). Those in the last category, called 'empirical technicians', trained themselves by observing and working. All the private advisers have their own clients and undertake other activities (teaching, occasional participation in projects, production). Veterinarians and engineers usually specialise in artificial insemination and reproduction, while agricultural technicians concentrate on animal health.

All these providers sell inputs to cover their advisory costs and earn extra income, which leads to competition between sellers of inputs, including commercial firms. The advisers provide information on the use of these inputs and guidance in their area of specialty. Producers use these services because they appreciate the proximity with the adviser, trust him, and believe that the information he provides is of high quality, or even believe that prices of inputs or conditions of sale are more attractive than those available from commercial firms. Some of these providers offer a range of well-defined services. For example, a veterinarian from Concepción has 120 registered customers (9% of livestock farmers in the province). He maintains close relationships with producers owning between 20 and 30 cows and has a programme of regular visits with 50 of them (two visits to each producer every month) and advises other producers over the phone. His most important interventions focus on animal health (emergencies and sale of medicines) and insemination. The veterinarian covers his costs by selling medicines, undertaking special interventions (insemination, surgery) or through monthly subscription in the case of an intervention programme (50 to 150 Sols[3] per month depending on herd size).

The hesitant interventions by dairy companies

Private companies often invest in setting up advisory services in order to ensure the loyalty of producers in supplying them with raw agricultural products of good quality as mentioned by Namdar-Irani and Sotomayor (2011) in the case of Chile for different types of value chains. In the Mantaro Valley, two types of dairy firms have the capabilities to develop these activities (Laporte et al., 2009; Cortijo et al., 2010): Gloria and Nestlé, two large companies present across Peru; and medium-sized family dairies (2000-3000 litres/day). Gloria is the only dairy company in the valley that employs a full-time technician to help producers. He organises meetings in communities on various topics and offers individual advice. He provided assistance to about 400 producers in the department in 2012, including in Concepción province. As in the case of PROGALE, producers appreciate individual advice more than they do the meetings, even though those organised by Gloria are more closely tied to producer practices.

Family dairy processors do not have the means to employ advisers to support the producers, but take various steps to ensure milk supply. For example, one of them engages veterinarians to provide training and finances part of this service. Another took advantage of the presence of an agronomist in the family to organise training workshops for farmers, disseminate information on pasture seeds, etc. A third received funding (2008-2010) from an international project to hire an adviser to help set up a producer organisation and conduct training.

According to the producers interviewed, such support is valuable but does not sufficiently take the context of small farms into account. For example, how to improve the hygiene of the herd

[3] *One Sol (S) = 0.35 US$ in 2013.*

when there is no access to potable water? Moreover, for them this kind of support does not fulfil the need for individual technical assistance.

Consequently, while dairy companies do undertake advisory activities, their investments in this field remain limited. Except in the case of Gloria, the number of producers served by these companies is not significant (7% of farmers in Concepción province) and advisory activities are usually not regular.

Consequences of the partial privatisation of agricultural advisory services

The partial privatisation of agricultural advisory activities has had a significant impact. More producers than ever are now being advised due to the increased number of providers and the competition between them. The advice though is still only focused on technical aspects since the advisers' activities are financed by the sale of inputs.

More farmers access to advisory services

This partial privatisation of technical advisory services in the valley has attracted attention because it has not resulted in the exclusion of producers, as mentioned in the literature (Cristovao et al., 2012), at least not within the valley. While Fernandez-Baca and Bojorquez (1994) reported that in 1990 about half of the respondents there could contact a private technician when their animals fell ill, the reality now is different: almost all producers (93% of respondents) have access to customised technical assistance, i.e. specific to their own herd. This assistance is provided mainly by commercial firms or private individuals, and only in part by PROGALE or Gloria technicians. This support is free, which largely explains its success. In addition, 38% of farmers have participated in classroom training organised by public institutions, the PROGALE project or the Gloria company. Gamboa (2012) also confirms these figures.

This widespread availability and choice of technical assistance is linked, no doubt, to the rise of the private sector but the advent of wireless telephony is also a major contributing factor. Thus, 73% of producers use their mobile phones to call for assistance or when their animals have health problems. PROGALE technicians organise and schedule their visits over the phone. Gloria's technical adviser undertakes three types of visits: scheduled in advance by the company; requested by a producer; and whenever there is problem with the quality of the milk delivered.

It must be noted that both public institutions (PROGALE), as well as private entities (Gloria), focus their efforts on the largest producers because of their production potential (Table 1), which creates a *de facto* inequality in access to advisory services. On the other hand, commercial firms and individual advisers work with all producers, provide advice on the use of inputs, and finance their services through their sales. In such a system, no producer is neglected since the primary goal of the technicians' intervention is to get the producer to use inputs. However, we have already noted that the number of producers supported by each adviser varies widely.

Table 1. Percentage of milk producers, according to herd size, who receive training and technical assistance, for different types of advisory entities

Cattle numbers	1 to 3 (n=12)	4 to10 (n=12)	11 to 20 (n=10)	21 to 30 (n=4)	> 30 (n=4)
Public institutions' training	0	33	60	50	50
PROGALE and Gloria's technical assistance	0	33	40	100	50
Individual technical assistance	100	83	100	100	50
Commercial firms' technical assistance	100	92	90	100	100

An ever more technical advice approach which does not address all the farmers' demands

Advice is provided only on technical issues, based on the elements and principles of the Green Revolution (genetic improvement, animal health, animal nutrition, intensification of pastures, etc.). Landini (2012) calls this orientation in Latin America 'persistence of diffusionism' because such type of advice assumes that the main constraints are related to technical issues and farmers are ignorant about new solutions. Public institutions, just like the private ones, continue to focus on this 'technocratic' approach in their training programmes, without adapting them to the diversity of farms or the abilities and needs of the farmers (Figure 1). They are unable to propose alternative models not only due to time constraints (number of families monitored per technician) but also to the lack of their own training in this domain.

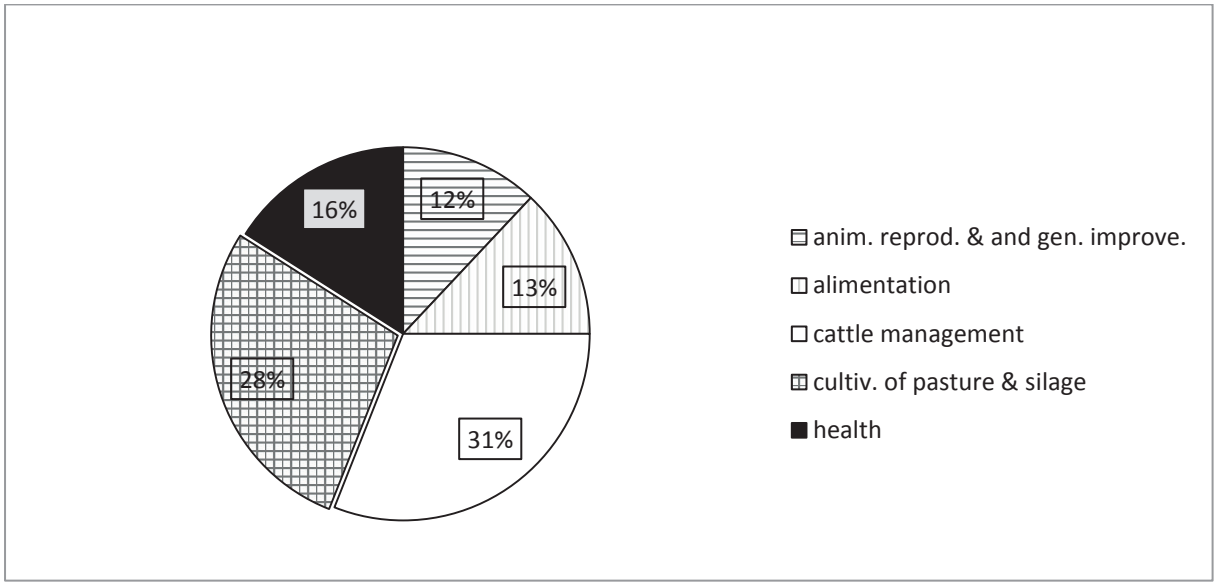

Figure 1. Distribution of training programmes according to technical topics (%)

This is especially true in the case of the private sector, where the advice most often focuses on the increased use of vitamins, control of parasites and mastitis by recourse to medicines, artificial insemination, and the use of improved pasture seeds. Service providers are taking

advantage of the positive interaction between: (i) the offers focusing on these themes, which promote the use of chemical inputs, external feed for animals and medicines; and (ii) the demand by producers for specialised agricultural advisory services with quick responses to short term problems or emergencies such as preventing diseases. But there is an issue with other farmers' demands and the supply of advice. In other words, advisory services do not address some important questions that producers ask, such as on managing interactions between cropping systems and livestock rearing; on managing fodder plots to respond to changing needs of the herd during the year; on improving the economic and financial performance of farms; or on food security for the family (Bienz & Le Gal, 2012). Of the three major components of agricultural advice identified by Röling and Groot (1998) – technology transfer, advisory process, and supporting learning – the only one that is found in the Mantaro Valley is the first. Such an approach has limitations because it does not foster learning by the producers, does not it take all their needs into account, and ignores the local actors' capacity to innovate (Scoones & Thompson, 2009).

Advisory services funded by the sale of inputs and generating an increase in production costs

Since the agricultural advisory services of the public institutions used to be free and funded fully by the public sector, the sharp decline in direct funding by the State has had an immediate impact on them, as is evident by the situation of the region's Agricultural Agency. This has led to the launch of agricultural advisory projects by the regional government in Junin department. An example is the ongoing PROGALE project, but its ups and downs have resulted in a lack of continuity in its activities. The 'Innovation and Competitiveness for Peruvian Agriculture' project (INCAGRO), funded by the World Bank (2008-2010), helped to test a new competitive funding mechanism for agricultural research and extension in response to requests from local actors to facilitate diversification in the provision of advisory services. However, INCAGRO has funded only one project in the Mantaro Valley[4], and the State did not continue with this mechanism when this project ended.

The private advisory services are funded by the sale of supplies (medicines, animal feed, seeds, fertiliser) or through the purchase of milk (the case for Gloria and other companies that provide services). To ensure the sale of inputs, and especially to gain the loyalty of producers, the supplier must ensure that he provides quality service, with quality being assessed on the resolution of the producer's problem. However the funding mechanism naturally orients the advice the supplier dispenses according to his product offerings. In consequence the farmers buy ever more inputs. Klerkx and Jansen (2010) formulated that such a risk of privatisation has been noted in the literature. As a producer of the Mantaro Valley says, "*Everything can be solved with vitamins and injections."* Only a few producers (7%) pay cash to individual advisers to benefit from technical assistance through regular farm visits without systematic purchases of inputs. Such advice could be perceived as more independent and less input oriented. Moreover, for many of these agents, this level of activity is not sufficient to make a living and they have to engage in other activities (consultancy, agricultural production, etc.).

As a consequence the farmer production costs increased. Cortijo et al. (2010) estimated that the cost of fodder and concentrates purchased, as well as measures to ensure animal health

[4] A dairy was financed in this way in the valley, which facilitated the creation of a producer organisation to improve relations between the producers and the dairy companies.

and reproduction, represent 38% of production costs for dairy farms, or 50% if the fertiliser for pastures is also included. These costs represent between 1000 and 1400 Sols/cow/year. Gamboa (2012) arrived at similar values. These figures show that the size of the inputs market can reach between 15-20 million Sols/year in the Mantaro Valley.

Strong competition between advisers, and needs for training

The partial privatisation of technical assistance has led to competition between service providers in Peru, as in other countries (Labarthe, 2005). But the offers of public and private sectors do not differ much, neither in their topics (on agricultural practices), nor on the advisory methods used (mainly top-down). When looking for technical advice producers can take advantage of this variety of offers to select the one that suits them best. Insemination is a good illustration of this competition since veterinarians, private inseminators and public institutions offer the same service at a very wide range of prices, from 15 to 600 Sols/cow. However, this competition does not ensure that the producers are provided with sufficiently pertinent or complete information by the advisers to allow them to make an optimal choice. Using once again the example of insemination, very few producers have access to a quality service that allows them to choose a relevant race and insemination strategy to improve their livestock herds. In addition, strong competition creates problems for qualified advisers when they have to deal with 'empirical advisers' who lack proper training and offer cheap services to attract customers, but without any guarantee of quality.

Advisers need to access new information to maintain their skills: continuing education is essential to them, but no system currently exists to this end. Universities sometimes offer classes on topics related to dairy production, which many advisers ask to participate in. But there are no courses offered to improve their methods of dispensing advice: organising a workshop, encouraging interaction, generating own knowledge through a combination of local and academic knowledge, etc. When the advisers encounter difficulties, some of them contact colleagues in their personal network to obtain information and support about poorly understood issues. Others organise 'informal' get-togethers with colleagues to share experiences and knowhow. Such advisors' networks are observed in other countries, for example in England when advisors need to access knowledge regarding complex issues not addressed by the formal innovation system (Klerkx et al., 2013). However the main sources of information (posters, documents, etc.) and of training (conferences or individual exchanges), for advisers as well as for veterinarians, are the manufacturers of inputs, supplying the valley's commercial firms. This trend does not guarantee that the information provided is impartial and further pushes the advisory approach towards the promotion and sale of inputs.

The lack of public policies to support the changes in the advisory system

In the classification proposed by Rivera (2000), the State relied on two approaches to address the state withdrawal from advisory services: privatisation and decentralisation. In Peru, privatisation creates competition between private providers, which can be positive for producers, but also between private and public providers, which tends to translate into a waste of resources. In this sense there is a lack of strategy from the State to address the privatisation of advisory services because the task division between the public sector and the private sector is not clear and because the rules for a free market are not put in place to monitor the competition among private actors.

In the Peruvian case, decentralisation has also failed to encourage a significant increase in new advisory services because there is no significant transfer of public funds from the State to the local governments to address such issues, and because there is a lack of coordination between service providers. Better coordination between local stakeholders is needed to promote sustainable rural development. The Agricultural Agencies have not been able to play an effective coordinating role due to a lack of a clear mandate with advisors able to play such a new role. In some countries, producer organisations play an important role in coordinating service offers (Le Coq et al., 2010), but this is not the case in the Mantaro Valley because of their previously related weaknesses. The advisors addressed this concern at the last workshop of 2012, in the context of the tensions observed between service providers. There are no clear cut solutions to overcome this lack of coordination but the actors, with the support of the State, must design what Birner et al. (2009) call the best fit.

Recommendations and Conclusion

The withdrawal of the State, through decentralisation and the partial privatisation of agricultural extension, has resulted in the rise of commercial organisations and private advisers in the Mantaro Valley. Consequently the sale of inputs funds most advisory activities and this limits the scope of advice to isolated technical aspects, thus ultimately increasing the overall production costs of the farmers. The literature on the impact of privatisation on small producers (Cristovao et al., 2012) states that privatisation tends to exclude producers from receiving agricultural advice in situations where they are unable to pay for the service, either directly or indirectly. Contrary to this literature, this study demonstrates that the producers in the Mantaro Valley have not suffered from any exclusion effects. Every producer has access to a technician, even though the advice they receive may not be pertinent to their real needs. However the advice provision is sub-optimal due to a lack of clear task repartition between the public and private sector and a lack of a coordination mechanism. In this context, this study provides new evidence for analysing the privatisation of extension systems by highlighting a process that is little known by policymakers at the national level.

This study allows us to make five recommendations for operational purposes:

- A dialogue between farmers and their organisations, on the one hand, and with organisations, on the other, is essential in order to define jointly a development programme based on the actual needs expressed, and to take the real capacities of the region's human resources into account. Such a dialogue can facilitate coordination between service providers, for example with the creation of a platform for exchanges between actors, which could be more effective than the creation of a body to coordinate activities of rural development actors because of the inherent risk of bureaucratisation;

- Public advisory services should, on the one hand, develop activities in areas where they will not compete with the private sector, such as overall farm management, economic management, environmental impacts, irrigation practices, market access, etc., and, on the other, facilitate a systemic coordination between the agricultural sector's various actors. However, such an extension of responsibilities requires stable public actors, with a new profile, i.e. with a broker role, able to rely on a systemic approach with a global vision of development and capable of supporting interactive facilitation processes by not limiting themselves to just technology transfers;

- It is necessary to support the private sector to build the capacity of its technicians, with access to training that is independent of input-selling multinationals. In addition, it is important to implement processes to assess the quality of the services of the private providers in order to limit competition from the unqualified among them, e.g. with advisors certification systems. Quality control of the inputs sold should also be improved by strengthening and enforcing national laws;

- The strengthening of producer organisations appears to be an essential condition for developing a dairy sector with effective relationships between producers, dairy processors and service providers. Such innovative organisational learning would allow producer organisations to play an important role in the provision of technical assistance by negotiating with the private and public sectors for the support methods necessary for their members and/or by promoting a form of 'de campesino a campesino' advice;

- The State has to respond to the rise of the private sector by developing a learning and training programme for both public and private advisers. New rules are also needed to support the privatisation by better defining the role of the private and public sector. Such rules could be adapted through a platform to test new methods of funding advisory services, including those with a combination of private and public resources. To introduce more transparency, an information system could also be created (that is accessible by producers and their organisations) covering the use of chemical inputs, the quality of service providers, or other topics that hold no interest for the private sector such as farmers' innovation.

In conclusion, the privatisation of agricultural advisory services through increased sale of inputs can benefit small farmers towards a sustainable development only if the State is able to implement and manage monitoring mechanisms. These are needed to promote effective and systemic advisory services that complement the private sector's offerings and to strengthen the capacity of producer organisations to defend the interests of their members. Otherwise the privatisation of these advisory activities could encourage only excessive consumption of inputs, with its associated environmental consequences and increased economic risks for small farmers.

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Agri-environmental advisory services in pluralistic AKIS in the EU - an analysis framework for governance structures

Knuth, U.[1, 2] and Knierim, A.[1, 2]

[1]*Leibniz-Centre for Agricultural Landscape Research, Institute of Socio-Economics, Germany.*

[2]*University of Hohenheim, Institute of Social Sciences in Agriculture. Department of Rural Sociology, Germany*

Abstract: Great challenges regarding biodiversity conservation, water protection and sustainability are increasingly important in agricultural funding and regulations. As such, knowledge exchange, learning and innovation are crucial aspects of current EU funding for rural development. Funding for advisory services dealing with these challenges exists, but first evaluations concluded that the delivery of the knowledge transfer and advisory activities was not sufficient relative to the measures' importance and the expected outcomes for such activities . From a governance perspective, the objectives and organisational features of advisory programmes are crucial elements to be considered when designing advisory programmes related to agro-environmental advice. The objectives and organisational features of such advisory programmes have mainly been studied at the case-study level; comparative analyses at EU level have not been found. Here, we present a conceptual framework for investigating governance structures of agro-environmental advisory services in the EU with a special focus on coordination aspects in privatised advisory systems. To develop this framework, an overview of theories and concepts is provided, which are related to 'agri-environmental advisory programmes' and particular attention is given to governance structures and coordination aspects. The IFPRI framework for designing and analysing pluralistic agricultural advisory services (see Birner et al., 2006) and the framework of Vatn (2015) for environmental governance structures are theoretical bases for the analysis framework and are further adapted to the specific characteristics of agro-environmental advisory services. The framework, briefly tested with two German cases, is helpful to differentiate actors according to their organisational background and their roles regarding coordination tasks.

Keywords: Agri-environmental*, advisory services, governance structure, Agricultural knowledge and Innovation System (AKIS), privatisation, biodiversity, water protection

Introduction

Agri-environmental schemes and the implementation of agri-environmental measures 'on the ground' have become a crucial policy instrument to work towards environmental goals. Successful implementation of agri-environmental measures is closely linked with farmers' access to knowledge, their sensitisation to environment-related problems in agriculture, and the development of farm-specific solutions. Knowledge transfer activities and advisory services for agri-environmental innovations are key elements of EU rural and agricultural

policies that aim to tackle the global challenges of biodiversity conservation, water protection, and sustainable farming. These policies make up one priority of the current Common Agricultural Policy (CAP) (Regulation (EU) No.1305/2013; van Uden (Ed.), 2012). Funding exists for advisory services regarding those challenges since a 'Farm Advisory System' (FAS) was to be installed in each Member State by 2007. Furthermore, the recent CAP reaffirmed and extended these funding possibilities (European Union, 2013). However, a recently published audit by the European Court of Auditors, which examined the provision of knowledge transfer and advisory activities co-funded through the EU budget for Rural Development (EAFRD), "*found that the delivery of the knowledge transfer and advisory activities was not sufficient relative to the measures' importance and the expected outcomes for such activities"* (ECA, 2015 p. 06).

From a governance perspective, the objectives and organisational features, in particular regarding coordination aspects of advisory programmes are crucial elements to be considered when designing advisory programmes related to agro-environmental problems. Objectives of policy-makers for agri-environmental advisory programmes are important as advisors in such programmes have the specific difficulty of conveying innovations related to environmental-friendly production practices because they often have to interlink conflicting interests of the contracting authorities and the farmer (Hejnowicz et al., 2016). Organisational features, and herein especially the coordination mechanisms, are assumed to be relevant for the success of advisory programmes, because advice providers in EU member states are not only public actors, but increasingly are actors from the private sector and farmer-based and non-governmental organisations, especially in the field of agri-environmental advisory services (Sutherland et al., 2013). Additionally, environmental and agricultural issues are often handled by separate public authorities in each region who together are responsible for designing agri-environmental advisory programmes. This requires cooperation and communication between the authorities for well-working agri-environmental advisory services and this is not always the case.

Internationally published peer-reviewed studies on different aspects of such advisory services mainly exist at the case-study level (e.g. Atari et al., 2009; Ingram, 2008; Klerkx et al., 2006; Manderson et al., 2007). In the Netherlands, Klerkx et al. 2006 investigated a complex government funded support service for 'Nutrient Management'. They questioned some of the conceptual and practical assumptions of such interventions, and proposed that it may be more effective and efficient for governments to build more permanent institutions to facilitate the development of the agricultural knowledge market rather than to invest in voucher systems. Klerkx and Jansen (2010) elaborated on how to support private advisors in addressing sustainable farm management issues in their regular service contacts, and found out that effectiveness depends on an adequate mix of, and balance between, pull (stimulating farmers' advice demand) and push measures (building capacity of advisors).

In Great Britain, Ingram and Morris (2007) investigated the nature and extent of agri-environmental knowledge (soil best management practices) of agricultural advisors. Ingram (2008) had a closer look at knowledge exchange mechanisms, particularly 'encounters', between advisors and farmers in England; and Sutherland et al. (2013) evaluated the establishment of trust between advisors and their clients in agri-environmental advisory services. Just recently, Vrain and Lovett (2016) studied advisory services related to agri-environmental measures in four different regions in Great Britain to understand the role of

advisors in the uptake of measures on farms. An analysis of the agricultural advisory systems in the Netherlands and France with regard to 'multifunctional agriculture' is analysed by Labarthe (2009) by combining a historical institutional analysis and a network analysis.

Additionally, nationally published (evaluation) reports are available, e.g. for the German water protection advisory services (Techen et al., 2015) or Cross Compliance advice (Knierim et al., 2011). The question of how to integrate water issues into the 'Farm Advisory System' within the Member States was extensively discussed in a workshop at EU-level in Brussels in 2010. Results of the discussion are reported in a handbook for public authorities (Berglund & Dworak, 2010). The EU project SOLINSA investigated in eleven European countries the network approach for enhancing sustainable agriculture (Hermans et al., 2015 and www.solinsa.org).

Agri-environmental advisory services are closely related to public agri-environmental schemes (AES) and their pre-defined measures, which are implemented by participating farmers or land managers. But how exactly are advisory services related to AES, and to what extent? Are AES measures only the content of advice without institutional connection to the AES (e.g. Biodiversity advisory services in many German states) or is advisory service provision part of the scheme (e.g. Natural England's Environmental Stewardship programme in Great Britain; Hejnowicz et al., 2016); and how does this influence farmers' participation in AES? Such questions need to be explored more explicitly. Studies on the implementation process of AES (e.g. Hejnowicz et al., 2016; Juntti & Potter, 2002; Vrain & Lovett, 2016) deliver information on the role(s) of advisors in the uptake of AES measures rather than on the institutional relation of advisory services to AES which, if available, is a side issue not further investigated.

A conceptual framework for agri-environmental advisory programmes as such does not yet exist, but concepts and theories related to single aspects of agri-environmental advisory services exist. Sutherland et al. 2013 conceptualise trust in agri-environmental advice and information and several authors investigated farmers' environmental behaviour (changes) and interests as well as their influencing factors, e.g. Burton (2014), Siebert et al. (2006), Atari et al. (2009), Taylor and Van Grieken (2015). The specific relation between advisory services and environmental behaviour has been just recently investigated for example by Chantre and Cardona (2014) and Vrain and Lovett (2016).

Relevant conceptual frameworks for advisory services and the way they are embedded in the broader national knowledge system include the *'Agricultural Knowledge System (AKS)'* (Nagel, 1979), the *'Agricultural Knowledge and Information System (AKIS)'* (Röling & Engel, 1990 and 1991) and the '*Agricultural Innovation System (AIS)'* (Hall et al., 2006). Birner et al. (2006, 2009) provided the framework: "From 'best practice' to 'best fit,'" a specific analytical concept for designing and analysing so-called 'pluralistic agricultural advisory services' as one important element of AIS, 'disentangling' systems of agricultural advisory services into i) governance structures, ii) capacities and iii) management and advisory techniques. The IFPRI framework was recently adapted by OECD (2015) for evaluating 'green growth initiatives in agriculture'. Comparative analyses of agri-environmental advisory services within the EU do not exist to the knowledge of the authors. Such analyses could provide commonalities of governance structures of successful advisory services in comparable AKIS settings, especially regarding coordination structures, and lead to guiding principles for designing agri-

environmental advisory services. To conduct such comparative analyses with the aim of evaluating, for example, the coordination structures of such advisory approaches, a conceptual framework is needed.

Objectives and a definition of agri-environmental advisory services

This paper presents an analysis framework for governance structures of agri-environmental advisory services. It has been developed to be used for a comparative literature analysis of German and English peer-reviewed and grey literature that investigates advisory services for agro-environmental advisory services in the EU with a special focus on governance structures and coordination aspects in privatised advisory systems. To develop this analysis framework, first an overview of theories and concepts is provided, which are related to '*agri-environmental advisory services'.* By compiling characteristics of agri-environmental advisory services they can be used to develop the above mentioned analysis framework for governance structures in agri-environmental advisory services.

Here, the provision of agri-environmental advisory services to farmers is understood as a public responsibility. Hence, we assume, funding programmes for agri-environmental advisory services are necessary that aim at enhancing environmentally-friendly practices at farm level. Such programmes can be designed by public authorities (in cooperation with non-governmental actors), and advice will be provided by all varieties of actors from public, private, farmer-based or other non-governmental organisations. Of specific interest are research questions such as: what are the different actors' roles in the programme; how do they cooperate within the programme; and how does the design of such programmes influence this cooperation.

Concepts and theories related to coordination of advisory programmes

Agricultural Knowledge and Innovation Systems

Advisory services, today, are considered to be embedded in a larger national or regional Agricultural Knowledge and Innovation System (AKIS). Providers of advice, the main actors in agri-environmental advisory programmes, differ from country to country, or region to region. They are public, private or farmer-based organisations, or often are a combination of all three (Knierim et al., 2015). The AKIS concept becomes relevant when analysing objectives and organisational features (such as coordination aspects and the role of different actors) of agri-environmental advisory programmes. It aims at describing important actors for knowledge innovation processes and investigating the links and interaction between them. Intermediaries (Howell, 2006; Klerkx & Leeuwis, 2008; Schomers et al., 2015) and innovation brokers (Batterink et al., 2010; Klerkx et al., 2012; Koutsouris, 2012; Hermans et al., 2013) are new structural elements, being relevant for co-production of knowledge. The 'Agricultural Innovation System' approach has been receiving growing attention in policies related to agricultural and environmental innovations (Röling & Wagenmakers (Ed.), 1998; Wielinga et al., 2008) and led to funding e.g. innovation networks or operational groups within the European Innovation Partnership (European Union, 2013).

Governance structures in advisory services

Birner et al. (2009, for more detailed description 2006) provide a comprehensive framework for analysing and designing pluralistic agricultural advisory services as one structural element of Agricultural Innovation Systems (AIS). The authors of the framework find it not a promising

strategy, to import standardised models, e.g. Train-and Visit approach in developing countries, even though they are viewed as 'best practice'. Instead they recommend building capacity among policy-planners, managers, and researchers to identify modes of providing and financing advisory services that 'best fit' the specific conditions and development priorities of their country or region (Birner et al., 2009).

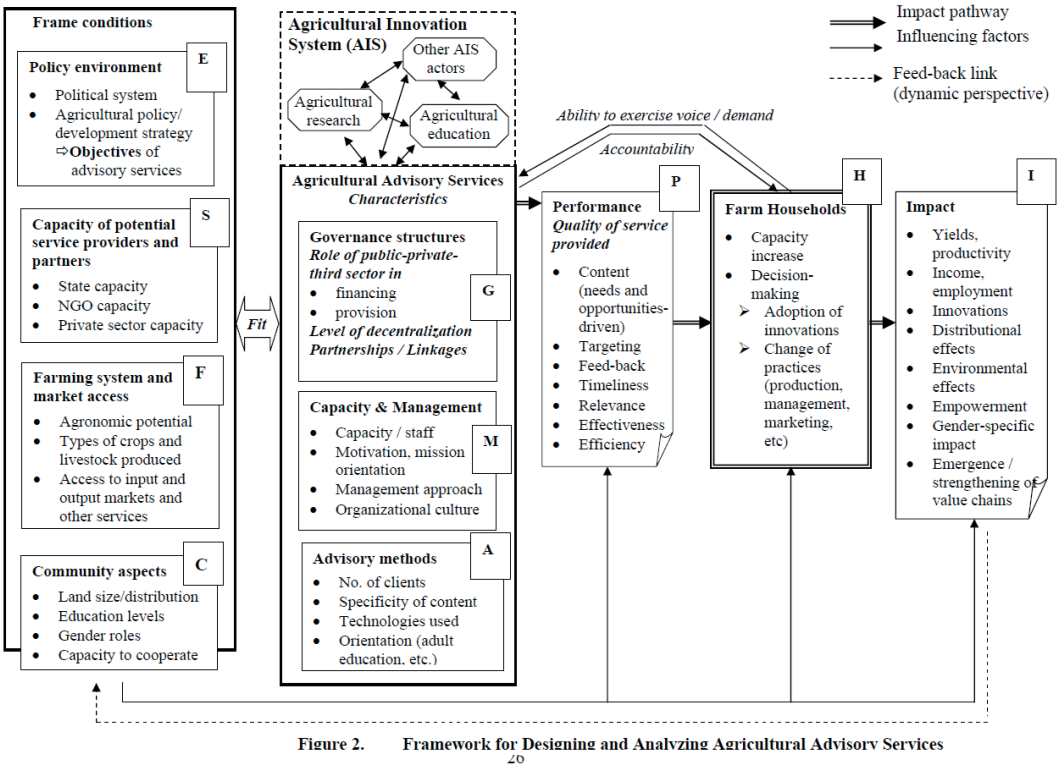

Figure 2. Framework for Designing and Analyzing Agricultural Advisory Services

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Figure 1. "(From best practice to) Best Fit – Framework" (Birner et al., 2006)

This 'Best Fit' framework disentangles advisory services into three main characteristic components as choice variables from a policy perspective: i) governance structures, ii) advisory organisations' capacities (staff number and qualification); and iii) management and advisory techniques. Additionally, the framework underlines 'frame conditions', to which advisory services have to fit. The frame conditions include the policy environment, the general capacity of potential service providers and 'farming systems and socio-economic conditions' (Figure 1). The framework also identifies further aspects to be analysed in relation to advisory services, such as the quality of advisory services, the farm households, and possible 'impact' dimensions. The research question regarding coordination structures of agri-environmental advisory programmes is closely related to governance structures of advisory services (Box G) within the 'Best fit' framework. It is considered as one choice variable of *"fundamental importance in the design and reform of agricultural advisory services"* (Birner et al., 2006, p. 25). There the term refers to a variety of institutional options that exist for providing and financing agricultural advisory services, such as fee-based advisory services or publicly

funded contracts to private companies[1]. To analyse the appropriateness of different 'governance structures' for agricultural advisory services, Birner et al. point to Welfare and New Institutional economics and transaction costs theory (Birner et al., 2006, p.32).

More recently, the term 'governance structures' has been described in relation to environmental governance as consisting of two main elements: i) actors - with their goals/motivations, capacities, rights and responsibilities; and ii) institutions - facilitating interaction (Vatn, 2015, p. 143). Actors in Vatn's logic are differentiated into economic, political, and civil society actors. Similarly, the actors in governance structures can be separated into the public sector, private sector and third sector. In this case, third sector actors are separated into non-governmental organisations (NGOs) and farmer-based organisations (FBOs) (Birner et al., 2006, p. 18; Labarthe et al., 2013; Knierim et al., 2015). Vatn (2015) described the institutions facilitating interaction between those three groups of actors as:

a) the resource regime: the rules governing the economic process including rights to resources and rules of interaction;
b) the rules governing the political process (constitutional and collective-choice rules[2]);
c) the institutions of civil society.
(see Figure 2).

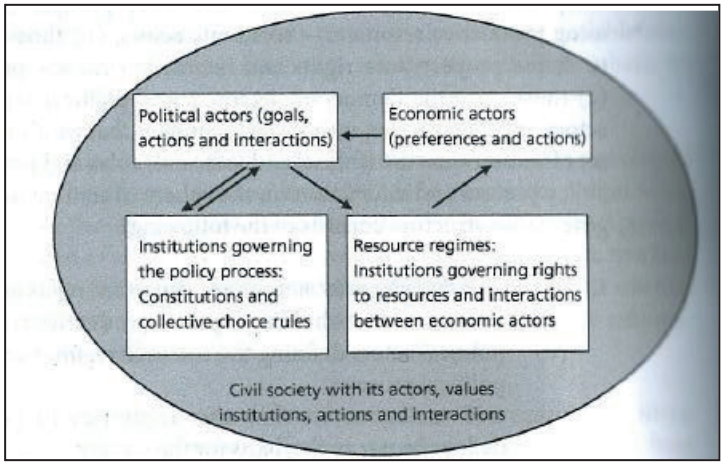

Figure 2. Governance structure according to Vatn (2015 p.144)

Conceptualising governance structures in agri-environmental advisory services

As stated initially, a successful implementation of agri-environmental schemes and the realisation of agri-environmental measures 'on the ground' are closely linked with the access of farmers to knowledge, their sensitization to environment-related problems in agriculture, and the development of farm-specific solutions. In the following sections, the general conceptual understanding of governance structures in advisory services is specified for the conditions of agri-environmental advisory programmes.

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[1] Overall 18 options are listed by Birner et al. (2006, p.19) combining different providers and sources of finance from the public, private and third sector (NGOs and FBOs).

[2] Constitutional rules determine, for example, the bodies of political decision-making and who are elegible to participate in political decision-making. Collective-choice rules are rules that define the specific procedures of collective decision making. (Vatn, 2015: p.144)

Characteristics of agri-environmental advisory programmes

Agri-environmental advisory programmes tackle a variety of topics related to environmental health and sustainability of farming. The objectives and therefore content of agri-environmental advisory services are either determined by the environmental problem, often biodiversity losses or water pollution, or by the farmer's 'problem', often related to legal requirements for farming or voluntary certifications. Agri-environmental schemes and measures could be considered as the area overlapping both interests, as they are currently one political instrument to solve environmental problems related e.g. to biodiversity or water quality. Supporting the farmer in choosing and implementing agri-environmental measures on farm is a main advisory task in this realm. Knierim (1997) provides a classification for farmers' demands for agri-environmental advisory services: 1) knowledge about current rules and regulations (cross compliance or greening); 2) decision and implementation support with voluntary options for agri-environmental measures by providing and structuring information (at the level of process changes) and by critically questioning; and 3) decision and implementation support in adapting ecological aspects to whole operations, or a specific farm enterprise branch, in which the advisor accompanies the entire process and constantly encourages monitoring the progress.

Agri-environmental advisory programmes have some specifics that differentiate them from production-oriented agricultural advisory programmes. The common feature is the target group, which are farmers, including farm enterprise managers or land managers. The specifics include problems related to the challenge of combining agricultural production knowledge with environmental knowledge. According to the authors, these are:

i) *A role conflict of advisors*. Advisors in agri-environmental advisory programmes often have difficulty conveying innovations related to environmental-friendly production practices that are not demanded or of interest to the farmer in the first place. Hejnowicz et al. (2016, p.240) speak of "*tensions arising from the competing agendas and objectives of the different actors involved* [...], *for instance, farmer selection of management options versus Natural England's target environmental objectives. Farm advisors suggested that they had to negotiate this balance whilst also serving the needs of their clients."*

*ii) Challenging knowledge qualification requirements for advisors. A*dvisors in agri-environmental advisory programmes, e.g. biodiversity advisory services that are just developing in Germany now, have the task of discussing the environmental impacts of their farming practices and options for change with farmers. For this task the advisor needs to know a lot of detailed nature-related knowledge. Additionally, trust within the advisor-farmer relationship is a precondition for initiating change processes in farming behaviour. In Germany, currently discussed among actors involved in biodiversity related advisory programmes is: when is it useful and practicable to involve (or in privatised systems, contract) an agricultural advisor and an environmental advisor as a team?

iii) *High diversity of agricultural and environmental actors.* The recent development of pluralistic advisory services already implies a growing diversity of actors involved in advisory services; this becomes even more evident for agri-environmental advisory programmes. Institutional arrangements are manifold and are highly affected by the historical development of the national agricultural advisory system, especially its privatisation and centralisation status.

iv) Linkages and cooperation between actors. The level of cooperation and linkages between the different actor groups from the public, private and third sector highly influences the development and implementation of agri-environmental advisory programmes. Different levels of linkages are useful: linkages between agricultural and environmental actors as well as linkages between public, private and third sector actors. Conflicts regarding objectives and further arrangements of agri-environmental advisory programmes most likely occur, for example, when agricultural and environmental public authorities are not well interlinked and a cooperative working atmosphere for designing such programmes is missing.

v) No clear border between advice and educational activities. Agri-environmental advisory activities often include or rely on awareness raising activities as a pre-requisite for demanding agri-environmental advisory services (Klerkx & Jansen 2010). Methods for awareness-raising are often based on group approaches and closer to learning and information situations - and therefore educational activities - than farmers' problem-based advisory activities (Hoffmann et al., 2009).

An analysis framework for governance structures in agri-environmental advisory services

The following framework that aims at analysing governance structures and coordination aspects in agri-environmental advisory programmes combines the framework of Birner et al. (2006) with the definition of 'governance structures' of Vatn (2015), and incorporates the specific characteristics of advisory programmes related to agri-environmental innovations. In this realm, it is important to specifically focus on interactions between the different economic, political and civil society actors that are involved, as the role conflict for agricultural advisors in conveying environmental concerns and related innovations is centrally influenced by interactions. The complexity of agri-environmental advisory programmes is expected to be higher than in agricultural advisory programmes, because more actors are integrated, as they come from the agricultural and the environmental field. This is a challenge not only with regard to the core advisory activities but also for related quality management in such programmes and necessary competence development of advisors. Coordination within agri-environmental advisory programmes, which integrate this diversity of actors, is challenging. Additionally, as shown above, it is difficult to draw a clear border between agri-environmental education and agri-environmental advisory services methodology-wise and therefore also governance-wise. Hence, it is necessary to also consider actors and their interactions from the field of education related to agriculture and environment. Figure 3 aims to visualise the above mentioned aspects shedding light explicitly on the Box G: 'governance structures' as a characteristic of advisory systems in the 'Best fit' framework (Figure 1) and incorporating them in the figure of Vatn (2015).

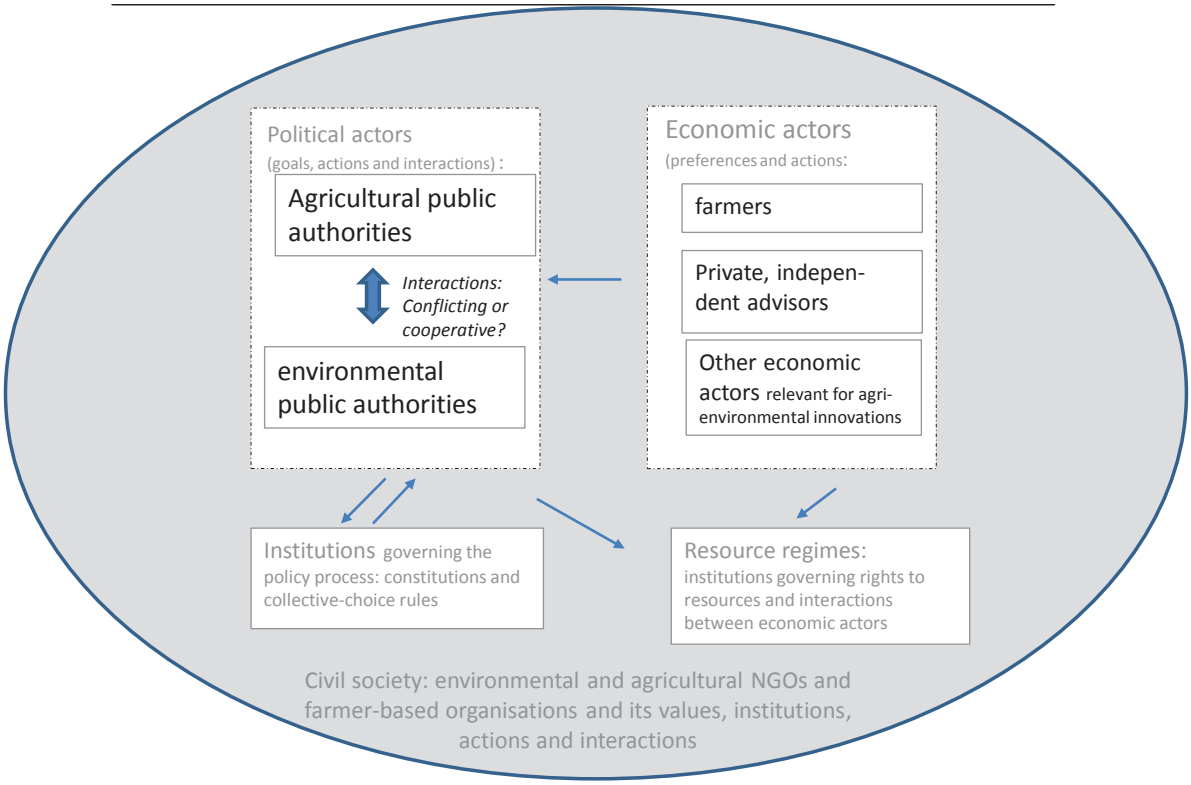

Figure 3. Analytical framework for governance structures of agri-environmental advisory services *(Source: own figure influenced by Birner et al. (2006) and Vatn (2015 p. 144))*

Here, political actors are considered as all actors involved in the decision about the design of an agri-environmental advisory programme and the implementation of the programme, as well as the monitoring and evaluation activities. Presumably in some cases it might be difficult to clearly differentiate between the political actors in 'Agri-environmental scheme' development and involved in the agri-environmental advisory programme. Economic actors in the governance of agri-environmental advisory services are considered mainly as the clients and the providers of advisory services. Interactions according to Vatn (2015) may be governed by trade, command, community rules, or no rules; differentiation between formal and informal rules is important.

Open questions regarding this framework are:

- Are public advisors in public authorities political or economic actors? Vatn (2015) mentions, "*that the same person may be an economic and political actor, as well as participating in civil society. We talk here of roles. Economic actors may be private, state or community based.[...] We may define civil society as the arena for creating the normative basis of a society and civil society actors as the set of actors expressing the interests and will of citizens*." (Vatn, 2015, p.144). This means that for public advisors it depends on the task they fulfil in an agri-environmental advisory programme, for example, designing the programme, or being a contractor like any other private advisor;

- Which relationship links the other characteristic elements, including the capacity and management of service providers (Box M) and advisory methods (Box A), both needed for agri-environmental advisory services (Birner et al., 2006)?
- What is the relation between coordination aspects and governance structure? 'Coordination' is understood here not as similar to governance, but as a specific task and form of interaction of actors within a governance structure. The main analytic question so far is 'who needs to coordinate what within an agri-environmental advisory programme?' More specifically, to what degree and in which form and intensity do, for example, private advisors or farmers' organisations, participate in the process of designing an agri-environmental advisory programme.

Preliminary reflections upon the roles and the coordination challenges of political and economic actors in two German agri-environmental advisory programmes

In this section, empirical insights from advisory services related to biodiversity conservation and water protection in agriculture are briefly presented and reflected on by applying the above framework to analyse briefly the actors involved, and their role with regard to coordination.

Biodiversity advisory services (BAS) in Germany

The following information and reflections are based on the participation of one of the authors in a two-day workshop on advisory services related to biodiversity and agriculture (BAS), where different approaches were presented and discussed by approximately 30 participants including advisors, administrative staff, and researchers involved in BAS (also compare Knuth et al., 2015).

Biodiversity-related agricultural advisory services (BAS) in Germany have now existed for 14 years. The approaches show how diverse their organisation and financing within Germany are. Moreover, the approaches also highlight how closely the BAS are related to the historical development of agricultural advisory services within each German state, especially because of its federal governance structure in policies related to agricultural education and advisory services. In Saxonia, with a just recently privatised advisory system, the German umbrella association of Landcare Associations[3] (DVL) - a non-governmental organisation - is the coordinating institution for the BAS programme, but further providers come from the private and third sector and BAS is mainly financed through European rural development funds (EAFRD). In contrast to Saxonia, and other privatised advisory systems (especially in East Germany), BAS in Rhineland-Palatinate is integrated into public advisory services provided by state and local agricultural offices ('Offizialberatung'), which are in the middle of restructuring agricultural advisory services by reducing services to information and advice related to the Global Challenges, mentioned at the beginning. BAS in Rhineland-Palatinate is financed out of the state budget; EU funds are not used. In the state Mecklenburg-Pomerania two parallel BAS approaches exist, both related to agri-environmental measures and one stronger to the CAP Greening Compliance than the other. In both approaches, mainly private and non-governmental advisory organisations are involved in the development, coordination, and provision of BAS. One approach, related to Greening, choice and implementation of agri-

[3] For further information on Landcare associations (LCA) Schomers et al. 2015 provide a case study examining the potential role of LCAs as intermediaries to improve the performance agri-environmental measures framed as payments for ecosystem services.

environmental measures at the farm level, are financed (only) by farmers, mostly large farms (>500 ha). Another BAS approach is financially supported as a pilot project by the state.

Political actors in these approaches that are involved in coordination activities such as developing, deciding about and implementing the design of an advisory programme include public authorities on state level, such as Ministries and subordinated state offices. However increasingly private and non-governmental actors become active in developing BAS approaches, and mainly public authorities provide financial support. Economic actors as providers and clients of advisory services in this realm would include, for example, private, independent or public advisors as well as conventional and organic farmers. Considering the history, BAS in Germany appears to have been first developed for organic farmers (van Elsen (Ed.), 2008). In later years, BAS has also become interesting for conventional farmers in relation to agri-environmental measures. Here it becomes clear that a historical view for analysing governance structures within the framework outlined above is necessary to develop a better understanding of who are, or have been, the actors involved and what are their goals and preferences. This is supported by Labarthe (2009) and his approach of combining a historical institutional analysis with a social network analysis for analysing the Dutch and French advisory system with regard to multifunctional agriculture.

Agricultural advisory services to support the Water Framework Directive (WFD) in Germany

The following case provides an example of the process of designing 'agri-environmental advisory services with regard to the Water Framework Directive', here onwards shortened to 'Water Advisory Services' (WAS). In 2012 both authors were involved in developing a conceptual framework for WAS for the German state Brandenburg commissioned by the state environmental office in Brandenburg. This state has a high level of privatisation and commercialisation of its agricultural advisory services, meaning no official public advisory infrastructure or financial support for advisory services exists and only actors from the private and third sector, most often private, independent advisors, are supposed to provide agricultural advice to farmers and farm enterprise managers (Knuth & Knierim, 2013).

The conceptual WAS design is based on an analysis of seven other German states and their WAS approaches in combination with investigating the current situation in Brandenburg with particular interest in who provides already WFD related information and/or advice. Preliminary results were discussed with actors from environmental and agricultural authorities at state level. Private, independent advisors as economic actors could be scarcely integrated, as, for example, only 7 advisors followed a workshop invitation to discuss options for providing (and financing) WAS in Brandenburg. An interesting fact in this case is that this conceptual design was commissioned by the state environmental authority from a research institution without notable involvement of the agricultural public authorities. Agricultural administrative staff were later involved in workshops presenting and discussing (preliminary) results. However, the concept developed in 2012 has not been visibly implemented. Presumably, this is because WAS implementation needs a close, cooperative interaction between policy-makers from the Ministry of Agriculture and the environmental state office (as the commissioner of the conceptual design), for example to use Rural Development Funds for this. This cooperative interaction appears to be difficult in Brandenburg.

Conclusions

The differentiation of actors within the framework into political, economic and civil society actors helps to differentiate actors according to their roles in agri-environmental advisory services. The combination of the Best fit framework with Vatn's (2015) explanation of (environmental) governance structures aimed at integrating environmental aspects of agri-environmental advisory services into the Best fit framework. The first application of the framework revealed that further reflections and adaptation of this framework are indispensable. In the application process of the framework it became visible that, in particular, the resource regimes were very difficult to operationalise for advisory services; similar experiences could be made for the institutions governing the political process. It seems to be more applicable to use the categories of provision and financing of advisory services (see Birner et al., (2006)), and add the task or process of designing agri-environmental advisory programmes including monitoring and evaluation. Furthermore, the impact and outcome of agri-environmental advisory services need to be integrated into the framework, as they provide important means to assess the appropriateness of the governance structure.

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Governance & operational dilemmas of a pluralistic and demand-driven extension services system

Mikwamba, K., Dessein, J.[1], Messely, L. and Kambewa, D

[1]*Gent University, Institute for Agricultural & Fisheries Research (ILVO), Belgium*

[2] *Institute for Agricultural & Fisheries Research (ILVO), Belgium*

[3] *Lilongwe University of Agriculture & Natural Resources*

Abstract: Governance and operation of a pluralistic and demand driven extension services system is very different from a top down centralised system of extension. While many actors sing about it unfortunately this has eluded many. We designed a qualitative study to understand how a pluralistic and demand driven extension service is governed and operated in Malawi. We identified four districts, two of which were known to have successfully implemented and two which were struggling to implement pluralistic and demand driven extension services. We targeted two structures - the Area Stakeholder Panel (ASP) and the District Stakeholder Panel (DSP). Focus group discussions and key informant interviews were conducted with actors at ASP and DSP respectively. We used content analysis to analyse the data. Our findings showed that governance and operation was double faced. On one hand we found that the structures were there on paper; on the other hand we found that actors had not embraced pluralistic and demand driven extension service provision. Ultimately we noted a dual existence of top-down and bottom-up approaches with a dominance of the former. There is in general a big governance and operational dilemma amongst the actors as they try to embrace pluralistic and demand driven services. There are struggles amongst actors for recognition and attribution of results of projects. On the other hand there is an inferiority complex amongst farmers and local structures over shadowing each other. There is also political interference in the structures. We recommend setting up a district sector wide approach for single basket pooling of resources. Besides we strongly recommend attitudinal change through capacity building on governing and operating a pluralistic and demand driven extension service.

Key words: Governance, operation, innovation, actors, AIS, pluralistic, demand driven

Introduction

Many governments have transformed their extension systems to be pluralistic and demand driven in response to changes from transfer of technology model (ToT) to agricultural innovation system (AIS). In this paper we consider the governance and operational dilemmas of providing a pluralistic and demand driven extension service in Malawi. We are inspired by the definition of governance by Cheema et al., (2007, p6) which states governance is those institutions and processes through which government, civil society organisations, and the private sector interact with each other in shaping public affairs, and through which citizens articulate their interests, mediate their differences, and exercise their political, economic and social rights. In our specific context we call all the players actors who interact in the provision of pluralistic and demand driven services. In this paper we interchangeably use the phrases “AIS” and “pluralistic and demand driven extension services” to mean the same thing.

The perceived importance of the AIS approach

The Agricultural Innovation System (AIS) perspective emerged as a response to the challenges of the theory of adoption and diffusion of innovations, which was preoccupied with studying why and how people come to adopt or not to adopt new agricultural innovations and practices (Assefa & Waters-Bayer, (2007) in Leeuwis 2004). The adoption and diffusion theory was felt to be top- down and non-responsive to farmers needs while the AIS is increasingly being recognised as an organisational phenomenon influenced by individual and collective behaviours (World Bank, 2006 in Ekboir et al., (2012). Douthwaite et al. (2001) argued that a successful technology represents a synthesis of the researcher and key stakeholder's knowledge sets, and creating this synthesis requires more interaction and negotiation instead of assuming a new technology is 'finished' when it leaves the research institute. The importance of interaction, coordination, and collective action in innovation systems has been recognised for more than two decades (Freeman, 1987; Lundvall, 1992; Nelson, 1993- in Mundial, B. (2012)). Some of the important reasons include what Ekboir, et al. (2012) argued, that AIS actors need to interact and address issues collectively including improved identification of opportunities for and challenges with innovation; leveraging of human and capital resources; learning and information sharing; and economic and/or social benefits. Ekboir et al. (2012) added that interaction and coordination may also improve the design and implementation of innovation policies by allowing more actors to voice their needs and concerns, resulting in more inclusive policies and faster diffusion of innovations. Stronger interaction and coordination also induce all actors, especially public research and extension organisations, to be more aware of and responsive to the needs and concerns of other actors, especially resource-poor households.

Practical challenges of AIS approach

Promoting interactions amongst actors is not a simple and straight forward thing as there are governance and operational challenges to surmount. There is a need for 'systemic instruments' focused on enhancing multi-actor interaction, reducing institutional barriers (Smits et al., 2004; Wieczorek et al., (2012) in Turner et al., (2013)) and seeking complementarities among structural elements in the AIS. Turner et al. (2013) added further that remaining challenges to effective interaction between research organisations and knowledge users include ongoing competition for funding, a historic research culture of operating in disciplinary silos, and funding mechanisms that focused on academic evaluation criteria. Turner et al. (2014) gave some examples of systemic problems as: (i) a lack of facilitative and transformational leadership and systemic intermediaries to support the formation of strategic innovation agendas in vertically and horizontally fragmented industries; (ii) a culture of hunting for funding within research organisations - hindering sustained involvement of researchers in innovation; (iii) a large number of actors in the R&D component of the AIS competing for public resources to pursue uncoordinated innovation agendas; and (iv) a lack of institutional support for interactions amongst actors and roles such as innovation platforms and innovation brokers. Turner et al. (2014) further added that the existing New Zealand AIS limits innovation to a linear process; restricting opportunities for innovation to occur and fostering competition amongst organisations that collectively have much to contribute to innovation in the agricultural sectors through constructive collaboration and roles in all facets of the innovation process. A study by Pamuk, et al. (2014) found that adoption of agricultural innovations through innovation platforms robustly promoted the adoption of crop management innovations across research sites but there were no significant effects for other

domains of innovation. Their results also showed that not all innovation platforms were equally successful and they presented evidence that the performance of these platforms depended on specific dimensions. Friederichsen, et al. (2013) found that competing models of innovation informing agricultural extension, such as transfer of technology, participatory extension and technology development and innovation, are often presented as antagonistic or even mutually exclusive but yet extension workers as well as managers integrate the reform discourses into the still-dominant transfer of technology model.

From the literature, we find that there are different interests, agendas, resource endowments and standpoints amongst actors in so far as AIS is concerned. As such it became interesting to see how governance and operational dilemmas are dealt with in a pluralistic and demand driven extension service provision. We also noted that in the literature cited there is a large focus on innovation as technology. While that is correct, we find that other aspects that together constitute AIS are ignored. Poppe (2012) mentioned that there are four aspects of innovation: product, process, marketing and organisation form. In this study we are concerned with governance of all components of innovation. The following research questions were answered in this study; (1) what are the governance and operational dilemmas that exist in a pluralistic and demand driven extension service; (2) how and to what extent are various actors interacting; and (3) whether and how actors are responding to farmers' demands.

In the context of Malawi, the pluralistic and demand driven extension services which are implemented through the District Agricultural Extension Services System (DAESS) herein is defined as the Pluralistic and demand driven services. According to Malawi Government, (2006) several structures have been set up through which farmers are supposed to be represented in the Area Stakeholder Panel (ASP) and the District Stakeholder Panel (DSP). There are other structures but we identified these two because they include farmers while the other structures are for experts and council members only. In the sections below we give some detailed information about the ASP and the DSP.

The District Stakeholder Panel (DSP)

The DSP is a platform where service providers and farmers plan and coordinate their activities. The purpose of the DSP is to act as a forum for dialogue among all actors thus providing agenda for demand and feed-back to which the services system as a whole has to respond. The DSP represents all actors in the agricultural sector at district level. The panel is composed of heads of agriculture technical departments at the district level, representatives of Smallholder Food Security Farmers (who should form 50% of the total membership), Semi-Commercial and Commercial Farmers, Farmer Organisations (FOs), NGOs, agribusiness groups, community-based organisations and a member of a relevant service committee of the assembly. Each DSP has no more than 20 persons for effective management and, in the spirit of equalisation, marginalised sectors of the community have good representation in the DSP.

The Area Stakeholder Panel (ASP)

The ASP represents all actors in the agricultural sector at traditional authority (TA) level. The ASP is composed of all extension workers of the Ministry of Agriculture. Other members are representatives of Smallholder Food Security Farmers (who should form 50% of the total membership), Semi-Commercial and Commercial Farmers, Farmers Organisations, NGOs, agribusiness groups, community-based groups and relevant committees of the assembly. The Agricultural Extension Development Coordinator (AEDC) provides secretarial services. The

ASP is a member of the Area Development Committee (ADC). The ADC looks at general issues of development at Traditional Authority (TA) level while the ASP is solely responsible for agricultural activities at that level. Figure 1 shows the structures studied and how they relate to each other.

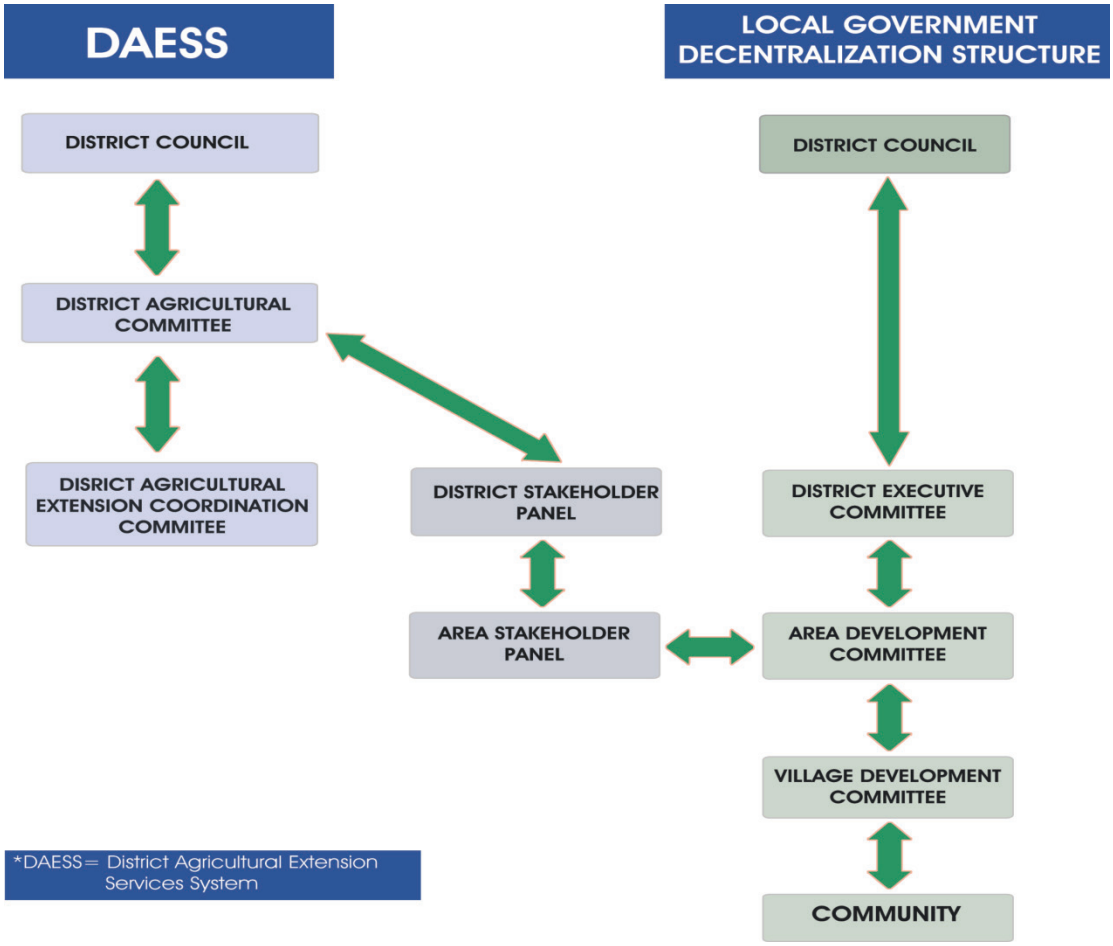

Figure 1. ASP & DSP in relation to other local government structures

The two structures described above (DSP and ASP) were the centre of analysis in this study. They are the only structures where farmers are represented. The other platforms namely District Agriculture Committee (DAC) and the District Agricultural Extension Coordination Committee (DAECC) have not been included in this study on the basis that they do not have the participation of farmers.

Methodology

The study was qualitative in nature and we used grounded theory to guide data collection methods and analysis (Glaser et al., 1967). Primary data were collected from various actors using purposive sampling as we specifically targeted members of ASP and DSP (Mammen et al., 2012). The actors included government officials, NGO officials at district and field levels and farmers. We used key informant interviews and focus group discussions as key tools in data collection. Secondary data were obtained from documents collected from the various actors. We purposively sampled four districts with Mulanje and Ntcheu known to be performing well in implementing pluralistic and demand driven extension services while Mchinji and Nkhatabay were known to be struggling with implementation of the pluralistic and demand

driven extension services (Limbani, personal communication, January 2016). A Map of Malawi is provided in Figure 2 with the study districts highlighted.

Figure 2. Map of Malawi with study districts highlighted

To increase the reliability and validity of our findings we used several theoretical assumptions of qualitative research (Gelo, 2012). First we used epistemological assumptions in trying to reduce the distance between the research team and the respondents. We collaborated to a great deal with the respondents by spending a lot of time in the field. We also used ontological and rhetorical assumptions (Gelo, 2012). Ontologically we have reported the results of the study using quotes and themes of words of respondents and we have provided evidence of

different perspectives. We have also rhetorically reported the results by using an engaging style of narrative. We have used the first person pronoun.

Selection of respondents

Respondents were selected based on their membership in both ASP and DSP meetings. To make sure that this was a reality, the District Agriculture Development Office (DADO), which is the secretariat for agricultural activities at the Council level, remained a contact and starting point. The DADO listed the actors that were active in the DSP and ASP. While there was motivation to conduct 100% sampling, there were challenges that were encountered so a few were left out as explained under study limitations. Key informant interviews were conducted at DSP level while Focus Group Discussions were conducted at ASP level. Table 1 lists the actors who were engaged in the study both at ASP and DSP levels.

Table 1. List of actors engaged in the study

District	Actor's name	Structure
Mulanje	**District Stakeholder Panels**	**Key informant interviews participants**
	District Agriculture Development Office-DADO	2
	Adventist Development and Relief Agency-ADRA	1
	Churches Action in Relief & Development-CARD	1
	Mulanje Mountain Conservation Trust- MMCT	1
	Area Stakeholder Panel	**Focus group discussion**
	Mimosa	1 (13 participants)
	Mthiramanja	1 (11 participants)
	Thuchira	1 (16 participants)
	Mulanje Boma	1 (12 participants)
Nkhatabay	**District Stakeholder Panels**	**Key informant interviews participants**
	District Agriculture Development Office-DADO	3
	Livingstonia Synod AIDS Programme –LISAP	1
	National Association of Smallholder Farmers' Association of Malawi- NASFAM	1
	Catholic Development Commission in Malawi-CADECOM	1
	Area Stakeholder Panel	**Focus group discussions**
	Malengamzoma	1 (12 participants)
	Mkumbira	1 (11 participants)
	Fukamalaza	1 (15 participants)
Ntcheu	**District Stakeholder Panels**	**Key informant interviews participants**
	District Agriculture Development Office- DADO	3

	National Association of Smallholder Farmer's in Malawi-NASFAM	1
	Center for Community Organisation and Development-CCODE	1
	Protofeeds	1
	Catholic Relief Services- CRS	1
	Hunger Project	1
	Catholic Development Commission in Malawi-CADECOM	1
	Area Stakeholder Panel	**Focus group discussions**
	Kwataine	1 (9 participants)
	Champiti	1 (14 participants)
	Nsipe	1 (12 participants)
Mchinji	**District Stakeholder Panels**	**Key informant interviews participants**
	District Agriculture Development Office- DADO	2
	Farm Concern International	1
	Heifer International	2
	International Potato Centre	1
	Concern Worldwide	1
	District Council	1
	Galaxy Radio	1
	Churches Action in Relief & Development-CARD	1
	Catholic Development Commission in Malawi-CADECOM	1
	Area Stakeholder Panel	**Focus group discussions**
	Zulu	1 (15 participants)
	Msitu	1 (11 participants)
	Kapondo	1 (16 participants)
	Dambe	1 (15 participants)

Data collection, handling and analysis

To ensure data quality, the researcher engaged experienced graduates in the area of rural development and extension who were thoroughly oriented on the objectives of the study and the tools that were used (Shenton, 2004; Patton, 1999). We conducted a day-long training with research assistants where the research tools were reviewed and pretested. The questions were deliberately open ended to guide a technical discussion where probing helped extract information from respondents as according to Legard, R. et al. (2003). All data from FGDs and key informants were recorded in a Microsoft Word File to facilitate content analysis of the data collected (Hsieh et al., 2005; Graneheim et al., 2004). Table 2 summarises the research design.

Table 2. Research Design Table

Objective	Source	Method	Tool	Analysis
To determine the governance and operational dilemmas that exist in a pluralistic and demand driven extension service	Govt officials Actors Farmers	KII	Checklist	
To assess how and to what extent various actors were interacting	Govt officials Actors Farmers	KII	Checklist	
To determine whether and how actors were responding to farmers' demands.	ASP Executive members Extension Officers	Focus Group discussions Key informant interviews	Checklist	Theme identification Content analysis

In analysing the data we considered a number of analytical frameworks and settled on one developed by Birner, et al. (2009) which disentangles the major characteristics of pluralistic and demand driven extension services into: (1) governance structures; (2) capacity; (3) management and organisation; and (4) advisory methods. Birner's framework enables us to consider all the four aspects of innovations which are product, process, marketing and organisational (Poppe, 2012). An alternative framework by Turner, et al. (2014) has a narrow view of innovations toward the co-development of technologies. We summarise and describe the four characteristics of AIS in Table 3.

Table 3. Four characteristics of AIS according to Birner et al. (2009)

#	Characteristics of AIS	Description
1	Governance structure	Institutional set-up of agricultural advisory services; public-private-partnerships in financing, level of decentralisation and Partnerships/linkages
2	Capacity	Human resources (staff numbers, training levels, skills and experience) as well as physical infrastructure, the vehicles and financial resources.
3	Management	Management style (top-down or participatory, rule-focused or results-focused), as well as the procedures for planning, monitoring, and evaluating advisory activities, and for managing financial and human resources.
4	Advisory services	Advisory methods used by the field staff in their interaction with farmers

Adapted from Birner, et al. (2009)

Results of the study

We have presented the results of the study with respect to the criterion developed by Birner et al. (2009), hence there are three subsections; we present findings with respect to governance structures and then with respect to capacity, and conclude by presenting

combined findings for management and advisory services. We noted that the characteristics are very much intertwined. Our interest was in the content and as such we have not separated issues by DSP, ASP or each particular district.

Governance structures

Each district in Malawi has a Council which coordinates the activities of various ministries including agriculture. The agriculture office (herein referred to as DADO) is secretariat for all agricultural activities at district level. According to DAESS the DADO is responsible for forming and making sure that DSP and ASP are up and running. As such we found out that many actors looked at the DAESS as the responsibility of the DADO; for example many actors said that they did not feel the need to work on enhancing the structures of the DAESS so as to enforce unity and togetherness in providing services to farmers as their one client/end user of various innovations they promoted. We found different scenarios in the districts in that in some cases some actors were not fully known by the DADOs. Likewise we also found some actors that had no idea about the DAESS. We also found that there was a tendency for most actors to form their own contact groups such that there was a plethora of contact groups within the same villages, each formed at the behest of an incoming intervention bypassing the ASP.

In two districts where DAESS was known to be successful we learnt that DSP had met once per year while it was supposed to have met four times. In the other districts the meetings had not taken place at all over the past year. The DADOs mentioned that massive staff turn-over was one contributing factor. The other factor identified was unavailability of financial resources to pay for provisions of the meetings. This was a surprise finding, but digging deeper we learnt that in fact the real problem was not money, as many actors could easily put together their financial resources to support either the DSP or the ASP. One respondent had this to say *"Let us be honest here. As much as we would wish the extension providers to complement each other's efforts, each is bound by specific agenda and objectives which are formulated at headquarters' level. Districts are points of service delivery, and most officers are not necessarily concerned with strategic objectives and planning. Their mandate is to implement. Hence very doubtful they could effectively change the implementation approach"* (Mulanje DSP member). We found out that the secretariat, apart from receiving normal funding to carry out activities, also had access to special funds whose allocation was supposed to be decided in consultation with farmers; this was not happening. In total the money available for extension services from all actors and government put together shows that more money is used as compared to the past twenty years, but due to poor coordination it feels like there is less money being spent (Masangano, 2015).

In terms of partnership we found in all four districts that several actors had entered into partnership agreements. The partnerships were not documented but a classical case was found in Mchinji where Heifer International (responsible for dairy) worked with various stakeholders as shown in Table 4.

Table 4. Summary of roles and responsibilities in a partnership

#	Actor	Roles and responsibilities
1	Heifer International	Implementers of Mchinji Livelihoods Improvement Project - provides dairy cows to farmers
2	GoM-Agriculture (DADOs Office)	Provides technical veterinary services
3	GoM Department of Water/ PumpAid	Drilling of boreholes for water supply for the animals
4	GoM- Ministry of Health	Provision of training on HIV & AIDS prevention, mainstreaming and training on nutrition
5	World Vision Malawi	Provision of Village Savings and Loans services

(GoM = Government of Malawi)

We found similar arrangements in Nkhatabay where Harvest Help Find Your Feet had engaged with Community Based Organisations in various development initiatives. We also learnt that NASFAM was complementing CADECOM efforts in disaster preparedness and environmental preparedness by expanding the physical coverage.

Despite the positive side of the story we also found that there were issues that needed to be considered in the pluralistic and demand driven services. We found out that the Ministry of Agriculture had not been proactive and innovative enough as a secretariat to demonstrate leadership to operationalise pluralistic and demand driven extension services. Instead, DADOs used irregular flow of finances as an excuse not to operationalise DSP. In the districts where the DAESS is not working at both levels (ASP and DSP members) the resounding theme pointed to the fact that DSPs have dismally fallen short of the roles as provided for by the Malawi Government (2006). In Ntcheu actors showed support only through attendance at functions of other actors when called upon.

At the lower levels we found that the ASPs were able to aggregate their demands but there was no DSP to consider their needs. We found that there was a new channel that had been created to take the issues from ASP to the district council. Ward Councillors (politicians) were taking issues from ASP to the DADOs office. This new channel did not constitute in any way an official position that the ASP reported to the Councillors. We also found that there was lack of a clear coordinated communication to villages about service provider operations, and while it may not cause conflict or competition; the symptomatic lack of a common approach or agenda in reaching out to the farmers resulted in confusion among farmers about project objectives and service providers' agendas. A case in point was that we found that both ADRA and NASFAM gave out sunflower seeds to farmers within the same locality with different repayment modalities. Lack of clear communication or collaboration in the delivery of these resulted in confusion in the community. While ADRA's "free" package was meant as a relief intervention after the crop was washed away, the one from NASFAM was meant as a loan in kind to be repaid at harvest time. With preference for the easier way, and lack of proper communication about the underlying objectives, villagers misinterpreted and found fault with NASFAM for taking a *'tough'* stance. We also found that the powerful actors were having an impact on pluralistic and demand driven. We found sadly though that actors in the private sector participated the least across all districts. While there had been efforts to attract private traders to attend DSP and ASP meetings, the response had been disappointing. In most of the cases it was the small agro-dealers (generally originating from the same localities) that

participated in meetings and delivery of extension. The big corporations/private companies did not avail themselves most of the time. In this regard we found that in all the four districts the issue of *'who's who'* was clearly a bone of contention in offering extension services in collaboration. Each actor wanted to demonstrate to their donors the direct impact of their efforts. So the question was who to attribute the positive results to given a joint undertaking? We learnt that some actors would want to exaggerate their contribution and attribute the success of an intervention to their individual efforts rather than acknowledge collaborative efforts, even if their contribution was modest. A case in point was in Mulanje where one organisation was struggling with implementation and the other one helped and quickly placed a sign post in the village overshadowing the partner. In Mchinji we found that one organisation constructed a warehouse for the farmers to keep produce in so that they could sell when prices were better; with the passage of time another NGO came and built a bigger warehouse adjacent to the old one blocking its accessibility and visibility.

In Mulanje we found a strong political connection between development structures and the ruling party. The members of the Area Development Committee (ADC), whose subcommittee on agriculture is the ASP, were all politically connected i.e. when politicians changed, all the committees were changed. We found unique operating guidelines for ASP e.g. the duration of the term of office for ASP Executives, as one respondent remarked: "*we resolved that the ASP terms should coincide with national parliamentary and presidential elections calendar"*. In the rest of the other three districts we still found power struggles between the ADC and ASP, more especially on perceived benefits. We found that the ADC, which looks at broader developmental issues (with ASP as just one subcommittee at traditional authority level) side lined the ASP on certain agricultural issues, e.g. receiving visitors or handling disease outbreaks were left to ASP but when it came to anything with immediate benefits (like distribution of inputs), ADC took leadership and ASP was overshadowed. In all the four districts we found a dual membership of most members in the ADC and ASP despite apparent deep misgivings between the two structures. The relations between most ASP and ADC can be described as a mixed bag; at best one of convenience, and at worst one fraught with outright hostility and mistrust. Probing revealed that other ASP members were just co-opted from other groups in the village to save face. This is explained by the concept of elitism and elite capture in the extension system in Malawi (Mapila et al., 2010) whereby the elites take up positions of influence. We also found that there were differences in categories of representatives of interest groups in ASP. For example, in Nkhatabay they emphasised representation of vulnerable groups like those with HIV & AIDS , while others in Ntcheu on mother care groups were active in persuading retention of adolescent girls in school. This was different in all the districts.

Capacity

The pluralistic and demand driven has allowed many actors to come together and deliver services. We noted the differing sizes amongst the actors and the difference in actions towards each other. We learnt that the DADOs office had carried out awareness on the demand driven extension services but still participation from the private sector was very low. Within the private sector the seemingly small actors were doing much better unlike the big, nationwide organisations. It was revealed that the decision making bureaucracy in many organisations contributed to minimal participation of the 'bigger' actors. However in terms of financial support to activities like field days, more was coming from the 'bigger' actors.

We found out that there were big differences in terms of the level and capacity of field agents representing different actors in the districts. Likewise we found that different field agents got updates on new innovations at different rates. There were substantial variations in access to the internet, newsletters and extension job aids among extension agents. We found that some actors were satisfied when they interacted with farmers during field days and agricultural shows and not through ASP or DSP meetings. They had a feeling that these were adequate avenues for interactions. We learnt that 'big' agro-dealers would easily pump money into field days and demonstrations but they would not attend the function to interact with farmers. Most agro dealers were satisfied with showcasing result demonstrations and not process demonstrations through trials. We noted that the entrepreneurial objective of wooing potential customers was the overriding one. Capacity building was not prioritised in this respect.

Management and organisation and advisory methods

We present results for two different aspects of the Birner's et al. (2009) framework: *Management and Organisation;* and *Advisory Methods* because we found that there is a close link between the two. On management, the framework talks about either top-down or participatory, rule-focused or results-focused while it talks about the specific advisory methods used in the field under advisory methods aspect. Every time we asked about delivery methods all actors were quick to speak highly about pluralistic and demand driven extension services. All that was meant to emphasise that there was a shift from top-down approaches to bottom-up approaches which encourages responding to the demands of farmers. In our interactions we learnt of a number of methods that were being used to deliver extension services including Farmer Field Schools, Farmer Business School, REFLECT, model villages, demonstrations, field days, clusters, lead farmers, agricultural resource centres, multimedia campaigns, farmer cooperatives and associations, and mobile platforms such as 321 or 212. Mobile platforms (321, 212) are toll free phone lines managed by different actors which are used to interact with farmers through a call centre where farmers can call and get a response to their questions. The list of participatory methods used increased with the sample which was an indication that there was indeed pluralistic of bottom-up approaches just like there is pluralistic number of actors. This confirmed a desire for a shift from top-down approaches to bottom-up approaches.

However, despite this purported shift the reality on the ground was different. Our interactions with the ASP pointed to the fact that there are still top-down approaches being used. The service providers are bound by specific deadlines and agendas from their organisations. We learnt that in cases of response to demands, they were so inflexible. At the time of the study there were already indications of drought in certain areas but the ASPs complained of no response to address the drought through irrigation. A case in point was ADRA which had facilitated REFLECT methodology in Mulanje West leading to action plans and villager developed proposals, most of which were not immediately responded to. This led to the frustration of the communities because the responses had always been that they would find for them the suitable service provider/donor for their projects. And yet farmers thought ADRA would respond urgently to their proposal for irrigation support with the looming drought. With a missing link from ASP to DSP, it was difficult for actors to claim to deliver demand driven extension services. We found that actors valued and prioritised infrastructural projects such as bridges and roads over the direct soft livelihood projects, unlike agricultural as this was manifested in allocation of resources for agriculture at Local Development Fund (LDF). In Mulanje and Ntcheu the little resources sourced from LDF were being used without consultation with ASPs. The ASPs, though aware of the availability of the funds, were not privy

to the exact details and processes involved to access and use the funds. So we found that centralised planning was still the order of the day in most organisations.

In the absence of ASP and DSP at the district level we found that there was no structure that linked farmers and actors including research. In some situations we found actors would work together (for example CARD and OXFAM in Mulanje) leaving the DADO to one side. In all districts, ASP members expressed discontent about being blatantly sidelined and shunned by several actors both at grassroots, demand aggregation level, and secondly at planning and service response level. They claimed service providers implemented what they had planned.

As a result of various actions of actors, we came across notable innovations. NASFAM had created Associations which were producing and adding value to various items including rice, groundnuts and chillies. Through the pluralistic and demand driven services there had been adoption of technologies which had failed many years in the past, for example intensification of Rice technology in Kilombero planting in Nkhatabay, promoted by NASFAM and the Department of Agricultural Research Services, which increased seasonal quota from 9 tonnes to 16 tonnes of rice: a variety, newly introduced to cater for market demands, was introduced to replace FAYA and other locally preferred but less marketable varieties. NASFAM offered the farmers practical alternatives to marketing constraints and formed associations to help with bulk transportation and storage. NASFAM also convinced farmers to prioritise production of the marketable Kilombero Rice variety over traditional FAYA and other less marketable varieties. In addition we found that crop varieties that were new had been introduced in areas that never grew them i.e. pigeon peas in Nkahatabay. The major preoccupation of people of Nkhatabay is fishing, and with dwindling fish supplies there was a need for alternative livelihoods. So through the efforts of actors the people have accepted and learnt how to produce pigeon peas. In Mchinji we found significant adoption of what is popularly known as Sasakawa – a one seed one planting station - planting method which had been rejected many years ago. Farmers argued that *'maize stalks needed to talk to each other'* as a reason why they stuck to the past practice of planting three seeds per station.

Lack of coordination amongst actors again manifested itself when we found out that there were conflicting methods used by various actors. Some actors gave out cash to farmers for attending meetings, while others provided food and others nothing. These conflicting approaches are a sign of failure of pluralistic and demand driven extension services.

Discussion and Conclusion

In this study we have used the framework of Birner et al., (2009) to understand governance and the operation of the pluralistic and demand driven extension services. The four components of the framework have been used in presenting the results. We noted that somehow issues in the framework are intertwined such that with some components we just had to combine them and then present them together. Nevertheless the framework has been able to provide results which show that pluralistic and demand driven services have a governance and operational structure. We hypothesised that there would be proper governance and operational structures which were working perfectly. We found a mixed situation with more negatives than positives. We found that coordination of actors at the district level faces a lot of challenges. Most of the challenges start with lack of proper regulation of

extension service delivery. There is no single work plan at the district level. A unified work plan could be a trap to attract funds into a basket for delivery of extension at district level just like there is ASWAP at national level (Ministry of Agriculture and Food Security, 2011) where donors and government put in money for agricultural development. With joint planning and execution, it means that governance will be facilitated as there will be no different approaches used. Failure of governance has reared its ugly head in many respects in Malawi's extension system and the results are always disastrous.

Since 2006, the pluralistic and demand driven concept has been prepared and shared with actors in the agriculture sector. However the major problem of ownership stands out clearly. Many of the actors think that pluralistic and demand driven services are the responsibility of the DADOs office. This is even common with other departments for example livestock, crops and land resources within the public service. Pluralistic and demand driven services require high levels of accountability and responsiveness amongst actors and yet actors prefer to implement activities as designed from their own corners ignoring farmers and even fellow service providers. Actors deliberately run away from ASP for their convenience of implementing initiatives and ultimately run away from accountability. It is known that participatory methods delay implementation of projects despite the known benefits that come in the long term (Claridge, 2004). We noted that actors valued and prioritised infrastructural projects like bridges and roads over the direct soft livelihood projects and agricultural activities. This is common when actors want to show tangible results at the end of the fixed period initiatives. Organisations compete to access funding and as such there is a tendency to engage in activities which can easily be identified, unlike provision of skills and knowledge. Capacity building projects are difficult to show results from (Hailey et al., 2005). Issues of social distance between actors and farmers are also affecting implementation of pluralistic and demand driven services as noted by Bentley (1994). Farmers suffer from an inferiority complex such that they don't have the confidence to demand services from the perceived superior extension service providers given pre-existing socioeconomic inequalities and relations of power (Agarwal, 2001). The issue of culture is also impacting on pluralistic and demand driven extension services. Malawian culture promotes respect to elders and therefore what chiefs say is always accepted, even when it is not useful/right. So ADCs where chiefs are members do override the powers of ASPs and the members just take that with a pinch of salt.

Pluralistic and demand driven services assume democracy has been fully embraced. The Malawi value system is yet to accommodate the democratic governance principles. There is a slow pace of mind set change among all actors. The majority of the older generation of extension workers, still stuck in the traditional technology transfer philosophy that farmers' knowledge is inferior, need to look to extension to provide solutions to the prevailing problems. Farmers remain unconvinced that they can question extension and demand better services. Ultimately this forces service providers to be rooted in the old top-down approach and not ready to listen to criticism from the farmers or to demand accountability as advocated by pluralistic and demand driven services. In this era of pluralism, it has become common for actors to engage with villages through traditional leaders to facilitate formation of "own" contact groups bypassing both the ASP and DSP. It apparently seems fashionable for each organisation to be establishing its own coordination committees in the villages instead of empowering the already existing groups (ASP). The councils seem to be less bothered by this proliferation of several development committees in the same locality; it certainly has brought about ad hoc implementation patterns in the pluralistic and demand driven system. We think

that if the existing structures were empowered and properly capacitated there would be no need for organisations to do baseline studies to collect data which are always available in the ASP.

So far we note that actors are still following a functional participation approach as described by Cristóvão et al. (2005) where extension service providers engage communities with pre-packaged objectives and activities with the expectation that people's problems will fit with these predetermined objectives. Nevertheless, the benefits derived from pluralistic and demand driven services have allowed farmers to benefit knowledge and technologies that they are implementing to advance their farming businesses. The intervention by Ward Councillors in place of ASP is uncalled for because they are political players who represent the interests of certain people and not others. The office of the DADO now has to single handedly address issues which could be addressed by a broad spectrum of actors. There is a strong call to detach development from partisan politics as it serves the interests of particular groups and not the entire population. The sizes of actors have a bearing on pluralistic and demand driven services as well. In some organisations, decision making is still centralised, while they are operating in a decentralised environment. If all actors decentralised properly it would mean that even low level staff could make decisions on budgets, mandates and approaches.

Through this study we have been able to demonstrate that there are governance and operational dilemmas concerning pluralistic and demand driven extension services. There is a need for serious capacity building and change of attitude for it to become a reality. Further we suggest that starting from the DADOs office, each and every actor should embrace pluralistic and demand driven service provision. DSP and ASP need to start running effectively. It is clear that farmers and other actors' reservations about capacity and effectiveness of ASP and DSP have evolved on the back of other frustrated and demoralised structures that crumbled under the weight of dormancy and inactiveness. The way pluralistic and demand driven services has performed so far requires that some elements be modified to reflect the context in which it is operating. The people, the culture and capacities need to be considered otherwise we will be stuck with top-down approaches which are disguised as bottom -up approaches. It would be necessary to set up a district basket fund where different actors would put in money and use it for implementation.

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Enrolling advisers in governing privatised agricultural extension in Australia: challenges for the innovation system

Paschen, J.A., Reichelt, N., King, B., Ayre, M. and Nettle, R.

Rural Innovation Research Group, Faculty of Veterinary and Agricultural Sciences, University of Melbourne

Abstract: The Australian agricultural research, development and extension (RD&E) system is an interesting and complex case of impacts and governance challenges arising from the privatisation of agricultural extension in Australia and internationally. This paper is an inquiry into the process of setting up a national, multi-stakeholder project collaboration aimed at stimulating the role of the private sector in the Australian agricultural extension and innovation systems. Following description of the project's action research design and use of a theoretical framework adapted from agricultural innovation systems (AIS) scholarship, the paper discusses the challenges the project faces in pursuing its aim of establishing an innovation platform to reframe current RD&E practices and governance arrangements towards an enhanced agricultural innovation system based on the collaboration of multiple actors. One fundamental challenge for the project emerging from initial findings is that its objectives tend to lead stakeholders toward an instrumental conceptualisation of the role of the private advisory sector in the AIS as one of demand and supply of services. This understanding poses challenges to the project process itself and potentially inhibits the project's vision of establishing and facilitating the governance of co-innovation processes by supporting new roles for advisers as key actors and contributors within the Australian innovation system. The paper describes these emergent challenges and initial project responses. In this way, the paper addresses the project as an 'innovation platform in action', offering to progress understanding of how to advance the establishment of innovation platforms within situated AIS more widely.

Keywords: Privatised agricultural extension, governance, innovation systems, co-innovation platforms

Introduction

The role and importance of farm advisory services in supporting producers to meet new challenges is of interest to both academic and political agendas (Fraure et al., 2012; Prager et al., 2016). Accompanying this interest has been empirical research into the challenges and impacts from privatisation of agricultural extension services and the increased reliance on commercial providers in agricultural extension systems, particularly in the European Union (EU) (Klerkx & Proctor, 2013; Prager et al., 2016). This research has revealed specific impacts of privatisation on the agricultural extension system including disconnects in the social organisation of the innovation system such as the exclusion of particular types of agricultural producers from relevant knowledge systems (Labarthe & Laurent, 2013; Prager et al, 2016); reduced links between private sector advisers and new knowledge/research (Klerkx & Proctor,

2013); and reduced professional pathways and capacity development opportunities for advisers (Labarthe, 2009).

The Australian agricultural research, development and extension (RD&E) system is an interesting case of these impacts arising from the privatisation of extension and the associated challenges for the agricultural innovation system (AIS) (Murphy et al., 2013; Klerkx & Nettle, 2013; Hunt et al., 2014). Following significant institutional change over the course of three decades, the Australian RD&E system is recognised as particularly complex and diverse (Hunt et al., 2014; Robertson et al., 2016). Historically, the extension function in Australia was tightly coupled with the role of the State in encouraging agricultural productivity and sustainability through a co-ordinated system of investment and delivery closely connected with research and development. However, with reduced public investment, the RD&E system has become industry-driven, and multiple organisations and individuals are involved in agricultural extension, including public, private, industry-good (farmer levy-funded) and vocational training providers. The Australian government and primary producers co-invest in research and development through Rural Research and Development Corporations (RDCs), and there are currently fifteen RDCs, of which five are Commonwealth funded statutory bodies and ten are industry-owned companies. Each of these have different extension and engagement models with the private advisory sector. This complexity has produced challenges that include: progressing co-innovation within a science-centric national innovation system (Klerkx & Nettle, 2013; Nettle et al., 2014); co-ordinating efforts with a diverse range of advisory organisations; and developing the capacity of the advisory sector (Murphy, et al., 2014). These challenges have come into political and policy focus through recent Australian government inquiries related to agricultural competitiveness (Commonwealth of Australia, 2014) and innovation (Commonwealth government 2015), leading to government investment in projects that aim to 'strengthen[ing] pathways to extend the results of rural R&D, including understanding the barriers to adoption' and 'Establish[ing] and foster[ing] industry and research collaborations that form the basis for ongoing innovation and growth of Australian agriculture' (Commonwealth Government, Rural RnD for Profit Programme 2015, p. 93). Within these government objectives is an implicit assumption that the private sector will replace the role of the State in extension delivery, particularly in advisory services that support farmer decision-making related to all aspects of farm management (ibid, p. 30).

This paper is an inquiry into the process of setting up one of the national projects funded under the Commonwealth Government Rural RnD for Profit Programme 2015, entitled: 'Stimulating private sector extension in Australian agriculture to increase returns from R&D' (referred to as the Advisory Project in the following). This novel research project is aimed at increasing agricultural productivity through an enhanced AIS in Australia. It aims to do this by understanding the role and functions of the private advisory sector, and by investigating the constraints and enablers of private sector engagement in the system. It applies action research with stakeholders to progress practice changes that address these constraints, and to strengthen cross-industry, public-private connections as well as the private advisory sector itself to drive agricultural innovation for increased on-farm profit. The project has received funding for three years and will conclude in June 2018. This paper reports on two research activities that have been run to date, at the end of the project's first year: following reviews of the literature and current RD&E engagement practice, the project has completed its first action research phase with a number of project stakeholder consultation forums. These forums inform a plan and methodology for action research–based trial interventions that will be established with stakeholders and partners at the beginning of the second project year and

will run for two years. By bringing together a range of AIS stakeholders in a novel interactive learning and research space, the trial interventions will likely establish new social networks that may have not existed before. However, a more formal social network analysis will be conducted as part of later research steps and is not reported on here. Our reference to social networks and social capital throughout this paper is therefore mainly theoretical and prospective.

In a departure from the traditional Australian linear RD&E model, the project adopts Agricultural Innovation Systems (AIS) as its conceptual framework (World Bank, 2006). AIS thinking provides a framework for understanding the dynamics (functions) and structures (elements) of complex extension and innovation systems. It has been influential in agricultural development by advancing the concept of innovation platforms as a social space and process to facilitate multi-stakeholder coalitions (Röling, 2002), to develop knowledge and understanding of a domain of activity, and to progress desired change through communication and learning cycles (Röling & Wagemakers, 1998). However, current literature outlines numerous challenges in establishing, maintaining and governing such platforms (Ison, et al., 2014). Most fundamentally, innovation platforms require a set of institutional arrangements and governance structures that facilitate participatory processes of knowledge production and learning; are supportive of emergent practices and collaboration (Hall, 2005; Paine & Nettle, 2008); build innovative capacity (Nettle et al., 2013; Schut et al., 2015); establish the legitimacy and mandate for the platform (Röling, 2002) and respond to the emergent nature of innovation platforms (Aarts & van Woerkum, 2002; Boogaard et al., 2013). However, analysis of the preconditions for the formation of innovation platforms remains limited, particularly in the Australian RD&E system. This includes, for example, analysis of what enables or constrains governance arrangements that support public-private alliances, the co-ordination of services and activities for innovation, and practices of co-development that enrol advisers as key actors in a complex RD&E system.

Drawing on conceptual framings from transition theory (Schot & Geels, 2008), this paper discusses the challenges the Advisory Project faces in pursuing the project's vision of establishing an innovation platform to reframe current RD&E practices and governance arrangements. The paper describes the implications for the co-development of innovation processes together with stakeholders as pursued by the project and proposes initial project responses to the governance challenges revealed by this preliminary analysis. In this way, the paper presents the Advisory Project as an opportunity to progress understanding of how to advance the establishment of innovation platforms within a situated AIS.

The Australian Advisory Project as 'innovation platform in action'

The conceptual framework

The Advisory Project adopts a systemic framework of inquiry in order to identify, articulate and diagnose the complexity and diversity of agricultural innovation dynamics for improved innovation outcomes. A systemic approach to the inquiry enables understanding of how knowledge moves through an innovation system and encourages participatory, networked, and trans-disciplinary engagement of groups and individuals in efforts to support innovation at a range of farm, regional or societal scales (Knickel et al., 2009) and across whole value chains (Klerkx, 2015). The Project uses AIS as its conceptual foundation based on the World Bank (2011, p.3) definition of AIS as '*a network of organisations, enterprises, and individuals*

focused on bringing new products, new processes, and new forms of organisation into economic use, together with the institutions and policies that affect the way different agents interact, share, access, exchange and use knowledge'. This systemic framing is central to the Advisory Project's methodology of co-developing interventions, working collaboratively with stakeholders as a basis for establishing agricultural innovation platforms. Innovation is increasingly considered as a process of co-development involving diverse groups of actors (RD&E providers from industry, public and private sectors) with shared interests '*co-operat[ing] and co-ordinat[ing] their activities to generate new knowledge, technologies, and practices for desired change'* (Klerkx & Nettle, 2013, p.1), as well as fostering partnerships and linkages along and beyond agricultural value chains. In this context RD&E is a subset of AIS (Klerkx, 2015). We particularly emphasise the importance of the horizontal organisation of such collaborations for the successful and lasting enrolment of all actors as equal contributors. This stance is reflected in our use of the term 'co-innovation platforms' throughout this paper.

The Multiple Level Perspective (MLP) is a theoretical approach, which posits how interventions in innovation systems (including AIS) impact at three scales - niches, socio-technical regimes, and socio-technical landscape (Geels, 2002; Schot & Geels, 2008). We conceptualise the Advisory Project as a niche within the dominant socio-technical regime that is Australia's existing AIS, as we explain further below (see also Figure 1). Niches represent 'protected spaces' within which innovation can develop in relative 'shelter' from mainstream competition. Socio-technical regimes represent the relatively stable dominant paradigm within which an emerging innovation will successfully compete or not. The socio-technical landscape is the exogenous context and represents political, social and economic structures within which regimes and niches exist (Hermans et al., 2012). Schot and Geels (2008, p. 540) describe three key processes for the successful development and operation of a niche that can lead to change on the level of the regime, which we use here as a heuristic for our preliminary analysis of emerging challenges at both project and system levels. These are the articulation of a shared vision and stakeholder expectations; the building of social networks involving all relevant actors; and the establishment and facilitation of learning processes at multiple levels.

Systemic analysis involves analysis of both structural and functional elements to better understand strengths and weaknesses of the innovation system (Hermans et al., 2012). Structural analysis includes identifying the actors, institutions, interactions and infrastructure that form the basic building blocks of the innovation system. Functional analysis supports the structural analysis by providing insights about dynamic processes that include entrepreneurial activities, how knowledge is developed and disseminated, how shared visions across stakeholders are created and embedded, how resources are accessed and mobilised, how demand and supply is balanced and stimulated, and how legitimacy is generated and sustained in the overall process. Structural and functional elements are highly coupled and each influences the other (Wieczorek & Hekkert, 2012). Analysis of structural and functional elements within the AIS can explain the enabling and constraining conditions in which niches are situated within their broader regime and sociotechnical landscape.

Locating the Advisory Project in the Australian AIS

The Advisory Project is a cross-sector collaboration involving six agricultural RDCs (Dairy Australia, Meat & Livestock Australia, the Cotton Research & Development Corporation, Sugar Research Australia, Australian Pork Limited, Horticulture Innovation Australia) and the state governments of Victoria and New South Wales. It is led by Dairy Australia and a team of

researchers at the University of Melbourne and has an overall aim of strengthening connections and the private advisory sector to drive agricultural innovation for increased on-farm profit.

The project is situated within the Australian AIS, which is currently dominated by a political focus on a science-centric RD&E system (Nettle et al., 2013; Commonwealth of Australia, 2015). The Advisory Project is a part of the overall Australian AIS and is intended to be an intervention in Australia's current RD&E approach to agriculture to drive positive change that will enable the AIS to address the challenges noted in the previous section. It is therefore an example of a 'niche' activity within which relatively small networks of transdisciplinary actors interact in the 'protected space' of this 3-year research project (Geels, 2002; Schot & Geels, 2008). The action research project is then emergent as an innovation platform (niche process) within the Australian AIS (regime) and is explicitly designed to coordinate or catalyse processes ultimately capable of achieving a regime shift (social innovation) over time (see Figure 1).

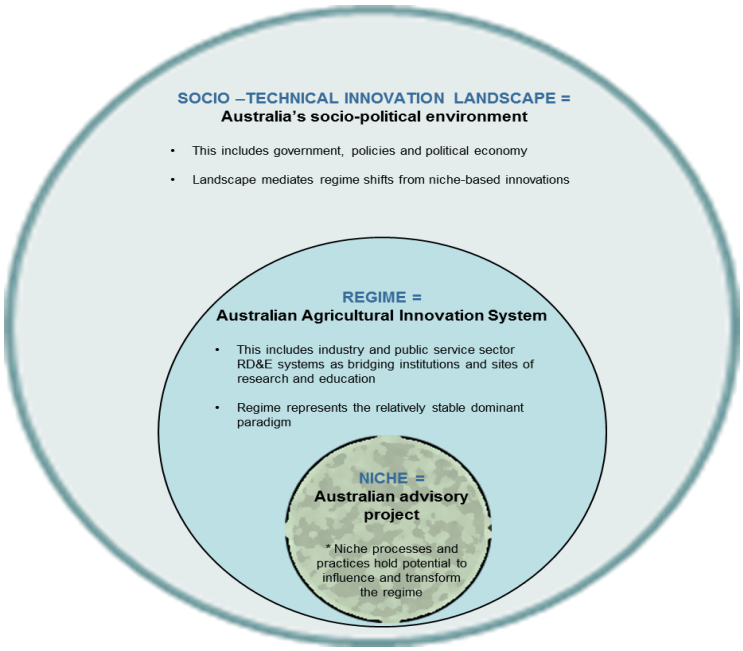

Figure 1. Locating the project in the multi-level Australian innovation system

Project design and methods

The (systemic) project design uses mixed method (Tashakkori & Teddlie, 2003) and action research approaches (Kindon et al., 2007) to address the four key research questions concerned with what motivates the private agricultural services sector to provide their services and if and how this sector prepares for increased engagement in the RD&E system; how producers decide on their investment in private provider extension and what are the broader implications and emerging gaps of privatisation in agricultural extension. The use of both quantitative and qualitative social research methods concurrently in an action research setting is more likely to lead to greater validity of findings by providing a form of triangulation (Tashakkori & Teddlie, 2003) and allowing for a number of perspectives to be drawn upon to make sense of data generated. Importantly, the methodology is designed to empower project

stakeholders and project participants as co-researchers, opening up 'spaces' for their direct input, and to document the research process and practice as a meta-inquiry that will enable changes to be tested and evaluated in real time (Heron & Reason, 2006). The mixed methods and action research approach is applied in five key research activities: 1) literature review, 2) project stakeholder forums, 3) national survey, 4) practice-based engagement trials, and 5) meta-inquiries (systemic scale). A social network analysis will be conducted as part of research steps 3) and 4), the national survey and engagement trials.

As part of the ongoing meta-inquiry into the Advisory Project, this paper draws upon three research activities conducted to date: a literature and practice review, project stakeholder forums and a systemic inquiry into AIS in practice. These activities are directed at the establishment of four practice-based and thematically selected interventions (the engagement trials) co-designed with stakeholders and project participants at a later stage of the project. These interventions are at the core of the project aim to help establish stakeholder-led co-innovation platforms by trialling different models of engagement between RDCs and selected private sector actors over the course of two years.

The literature review was based on a review of (50+) industry documents, research reports, academic papers and relevant websites, in combination with a series of guided telephone and face-to-face conversations (n=14) with key informants from state agencies, the cotton, dairy, horticulture, meat and livestock, pork and sugar industries regarding their engagement practices with the private sector in RD&E. The project stakeholder forums (n=5) target advisors and primary producers and are designed as a participatory process to inform the action research interventions (trials) and other research activities. To date, three forums have been held in three Australian states (South Australia, Victoria and Queensland) and have assisted in identifying opportunities for improved access and engagement with RD&E for advisers, identifying skill development needs of the private sector, and developing an understanding of the business models operating within the sector as either enablers or barriers to engaging with RD&E. The sampling criteria for farmer participation were based on a range of industries, engagement with advisers and supply chain actors, and range of ages. The sampling criteria for private adviser participation were based on a range of organisational type, alignment with different industries and supply chain actors, and a cross-section of career stage.

Project governance arrangements

Project stakeholders and partner investors are important co-researchers in the Advisory Project, as are primary producers and advisers participating in the project forums, and in establishing and maintaining the practice trials. The project governance arrangements, including regular reporting to and meetings of project management and steering committees, project stakeholder workshops and stakeholder attendance at producer and adviser forums, aim to maximise opportunities for stakeholder input and cross-sector engagement. There is a particular focus on co-developing with stakeholders the practice-based engagement trials that will be conducted as part of the project in order to address its main aims of strengthening connections between private advisers, RDCs and the latest research; identifying and addressing barriers of engagement, and stimulating growth of a capable private sector. Each of the trials will focus on one of four contexts for exploring private sector engagement with R&D, while ensuring their cross-sectoral significance and contribution to public, industry and private interest; they will further include a professional development component not currently used or available. The trials are intended as co-innovation platforms by enrolling all

stakeholders as active participants in the development of self-sustaining processes that are transferrable across themes and sectors, and therefore trial these platforms as mechanisms for the governance of innovation more generally.

The project governance structure is emergent and expected to remain dynamic as the project progresses. In addition to the Management and Steering Committees, an Expert Panel provides advice from an internationally comparative perspective. Australian extension professional bodies, the Agriculture Institute Australia (AIA) and the Australasian Pacific Extension Network (APEN) will be engaged in advisory roles when developing the trials and related training modules for advisers (see project map showing units of governance and sites of action research and engagement in Figure 2). Last but not least, each engagement trial will require its own separate governance arrangement designed to progress both research and applied change processes.

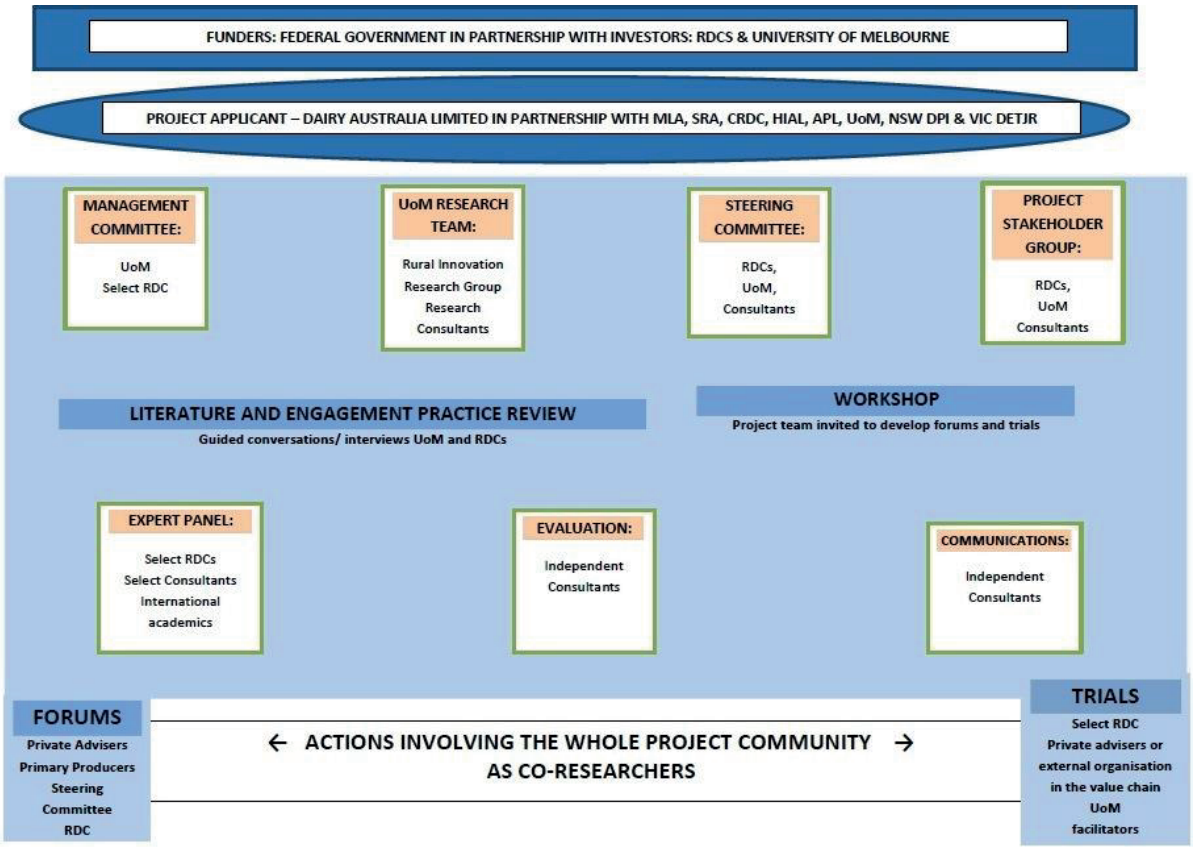

Figure 2. Project Map showing governance structures and sites for engagement

Findings and Discussion: emerging challenges from empirical research to date

The emergent challenges for agricultural innovation in the Australian context are based on an initial situation analysis drawing on the empirical work from the review process conducted in 2015 (literature and industry and public sector engagement practices) and forums run with primary producers and advisers across four states (April-June, 2016). The review process captured perspectives on private sector engagement on a per industry and state public service sector basis (top-down). The forums captured perspectives of producers and private sector practitioners about their engagement experiences with industry-based RD&E systems

(bottom-up). The results from both research engagements are presented here as emerging challenges based on their implications for the three niche processes: the articulation of expectations and a shared vision; the building of social networks; and learning processes, as discussed by Schot and Geels (2008, p. 540).

Variances in the degree and nature of privatisation (as a change process) across industries and the state public service sector

At a system scale, developing and governing the Australian AIS is challenging in that each primary industry's RD&E system is undergoing processes of privatisation at different rates and in diverse ways. Although the underlying trend at a national policy level is for social systems to transform towards neoliberal market-based models of operation, this is not occurring as a synchronised process and the agricultural sector is no exception. For example, the review identified that the dairy, and meat and livestock RDCs were only moderately developing towards a privatised RD&E system, considering a sustained reliance on levy-based investments and public funds to resource the system through an industry-based delivery structure. In comparison, the cotton industry has developed a largely commercial extension programme based on a central service delivery organisation, CottonInfo. This is a joint venture between Cotton Australia, the Cotton Cooperative Research Centre and Cotton Seed Distributors Limited (a private corporation). Significant corporate funds are directly invested in the employment and resourcing of the regional support roles for CottonInfo (Rural Innovation Research Group, 2015).

A further differentiation at the system level is that each industry's RD&E system operates at multiple geographical, operational and practice scales. For example, the dairy industry provides RD&E services and practices private sector engagement at a regional (sub-state) scale. In contrast, the meat and livestock industry operates at both national and state scales with examples of industry-based extension services being delivered at the national scale (through mass communication channels and information events) as well as engaging the private sector in specific delivery roles at the state scale in publicly funded programmes through Public Private Partnerships.

Variances in the degree and nature of private sector engagement across industries and the state public service sector

At the engagement practice level, the review process captured the diversity in engagement dynamics across industries, state public service sectors and within each industry's RD&E system (e.g. across programmes and projects). Three engagement typologies were identified: 1) directive (an engagement activity initiated by industry or public sector as an intervention or strategy that is directed by industry or public institution where the outcome focus is on the producer); 2) participative (engagement that invites participation from the private sector with varying degrees of involvement and influence on the RD&E system where the outcome focus is on the producer) and 3) supportive (engagement that can be directive or participative but the outcome focus is on servicing the private sector's needs). Each sector's engagement practice is a combination of directive, participative and supportive ways of connecting and interacting with the private sector in RD&E activities, however, there tends to be a dominant pattern of engagement highlighting the key engagement dynamic(s). For example, the dairy industry engages with the private sector in both participative and supportive ways (e.g. private

sector invited as co-researchers on a research project to trial a new participatory extension model based on social learning; providing capacity building opportunities for the private sector through targeted programmes such as participation in industry-led formal education). In contrast, the meat and livestock industry engages in more directive ways of extension delivery through mass communication channels and individual private sector actors are 'enrolled' by private sector actors putting in an expression of interest to become a co-investor in meat and livestock initiated R&D projects through a co-investment scheme (see Table 1 for a summary of engagement differentiation across the project partners). The different engagement modes used by each sector have implications for how both industry and public extension services work with private sector providers and can therefore influence the RD&E system and delivery of advisory services. At the structural (organisational) level, the different engagement dynamics are mediated through various funding, administration and service delivery structures established within each industry and state public service sector. These organisational structures can both enable and/or constrain private sector engagement dynamics.

Table 1. Matrix of industry and public sector engagement with the private sector

Industry/ State public service	Current engagement dynamics	Activity examples	Examples of engagement organisational structures
Industry 1	Directive	> Regional Development Officers involved in information provision > e-newsletter > contracting consultants in data collection	Central commercial extension institution
Industry 2	Participative and supportive	> Co-developing collaborative research projects > capacity building of advisory sector (education)	Regional service delivery platform
Industry 3	Directive, participative and supportive	> national roadshows > co-investment in industry-based research > collaborative delivery of extension programme	Strategic Co-investment Funding Pool
Industry 4	Directive and supportive	> joint development of a whole farm systems project > co-investment in innovation research	Co-investment R&D administration body
State Public Service	Directive and autonomous	> information provision > collaborative research ventures	n/a
Industry 5	Directive and participative	> inviting private sector participation in R&D planning through membership of R&D advisory committees	R&D Specialist Group

		> industry updates and meeting events	
Industry 6	Directive and supportive	> industry updates > field-based demonstrations > industry showcase events	extension and communication unit
State Public Service	Supportive and autonomous	> information provision > training events	Public and Private Partnerships

Engagement challenges from the advisor and producer perspective

From a practice (bottom-up) level perspective, private sector advisers participating in three of the four engagement forums run to date described similar variations in their engagement with R&D providers across industries. Advisors recognise that some RDCs welcome and support participatory engagement while others do not. The overall view of advisers who participated in the forums was that engagement with industry continues to be top-down and directive, largely due to being driven by government and funding obligations.

Private advisers experience of a 'lack of voice' and a 'lack of appreciation' of their expertise when working with RDCs as evidenced by inadequate RDC follow-through on consultant feedback, as well as a lack of dialogue and two-way knowledge flow between advisers and RDC. Despite the rhetoric of RDCs working collaboratively with the private sector, advisers did not often experience interactions as 'genuinely collaborative'. The lack of consistent core funding for RD&E projects and programmes, funding cuts and the short-term nature of programmes was identified as undermining potentially successful joint interactions. Further, advisers have experienced inconsistent communication when working with RDCs, which also undermines efforts at an industry scale to develop shared long-term vision for innovation and engagement.

Poor coordination between industries was seen as a missed opportunity to share learning around existing, well-functioning networks, structures, or engagement practices. Forum participants referred to RDC networks as 'closed' or 'hard to get into' and observed that this significantly constrains opportunities for advisers to develop their professional knowledge and to contribute to RDC strategy. Networking, collaboration and the sharing of learning were further constrained by market-based competition between advisers, particularly between sole traders or small businesses and large companies. Nevertheless, forum attendants saw opportunities for greater RDC involvement in adviser capacity building, and mentoring programmes for younger consultants as being opportunities to improve relationships and collaboration with RDC's.

Sole traders and small businesses in particular felt disadvantaged by the RDC engagement focus on big companies. Being a sole trader or small business presents greater challenges in accessing project funding as submissions are time intensive. Similarly, time and financial constraints limit the scope for personal professional development as access to new research, training and workshops comes at high financial costs. For sole traders and small businesses in particular time spent at a training day or workshop equates to financial loss for the business. Restricted or costly access to research and information, and insufficient availability of discussion and learning platforms for the translation of research findings and industry trials into meaningful practice further resulted in the perception of R&D organisations as knowledge gatekeepers.

Overall, the engagement practice review and forum responses reflect the challenges and impacts of privatisation and commercialisation in agricultural extension described by the international literature: exclusions from knowledge systems (Klerkx & Proctor, 2013; Prager et al., 2016), reduced professional pathways (Labarthe, 2009; Labarthe & Laurent, 2013) and overall social disconnects in the innovation system (Shwartz, 1994; Leeuwis, 2000; 2004). The following discussion of the empirical results from the Australian context elaborates on their implications for the establishment of innovation platforms such as the Advisory Project, their impacts on the extent of innovation and how these emerging challenges are being addressed in the present project, creating potential learning for addressing these challenges at system level.

Discussion

Setting up an innovation platform is a challenging endeavour at both the niche (project) and larger regime (AIS) levels. Our discussion of the emerging challenges surrounding the three key niche processes for innovation (Schot & Geels, 2008) highlights difficulties and opportunities for articulating a shared vision and managing multiple expectations, building social networks to generate new forms of social capital within and beyond the niche boundary, and enabling learning processes at multiple levels.

One fundamental challenge to the project and its process is that its objectives tend to lead stakeholders toward an instrumental conceptualisation of the role of the private advisory sector in the AIS as one of demand and supply of services. This understanding potentially inhibits the project aims of supporting new roles of advisers as key actors and contributors within the Australian innovation system by limiting them to an instrumental role (Leeuwis & Klerkx, 2009).

Constructing a shared vision and common processes for innovation as ‘desired change’ is challenging as participating RDCs have historically not functioned at a cross-sectoral level, have evolved their industry’s RD&E agendas in isolation from one another, and have few established collaborative practices to enable exchange of ideas. The different funding and investment models of RD&E (sub)systems and the varying degrees of privatisation across the RDCs and state public service sectors mean that it is likely to be difficult to create a shared vision of how and what the private sector should be ‘enrolled’ in as change agents in the AIS space. It is also likely to be challenging to create synergies as to where cross-sectoral investments should be made in the private sector for RD&E outcomes.

The multi-scaled nature of RD&E provision and engagement of the private sector within and across the industry and public sectors adds complexity to the operationalisation of Australia’s AIS. This increases the chance of: disconnections at institutional and cross-sectoral levels, disjointed social networks if they function as closed communities of practice or fail to cross scales of interest, and isolated social learning processes that generate ‘patches’ or ‘islands’ of innovations that remain inaccessible to the rest of the AIS, i.e. keeping a niche innovation within the confines of the local innovation boundary. Acknowledging the heterogeneous practice and diversity in experiences, needs and ideas, that exist amongst private sector advisors and producers is just a preliminary first step towards establishing an innovation platform (niche). A second step requires that key actors are engaged, empowered, and actively enrolled in contributing towards strategic pathways of innovation through project activities. Responding to the challenge of forging a shared vision, the Advisory Project has held an interactive workshop with project stakeholders, orientating actors into a shared ‘innovation space’. A number of multi-actor committees (including private sector members)

have been formed to govern aspects of this shared vision, and to empower a cross-range of actors in translating its various facets into practice. For instance, the interactions have surfaced evidence of shared (cross-sectoral) interest among the project partners in private sector engagement around themes of capacity building, targeting 'upstream' actors in the supply chain and building a cohesive value proposition as to why the private sector should be enrolled as key RD&E actors. Second, the forums for advisory and farmer practitioners provide spaces for dialogue and the capturing of RD&E innovation visions from their perspectives. Importantly, the forums offer participants the opportunity to make suggestions for and rate the value of different engagement trial options as well as the potential to become active contributors to shaping the trial interventions as co-innovation platforms in practice.

These activities respond to what Le Masson et al., (2012, p. 232) call 'generative expectations management' where the governance of innovation is orientated towards designing opportunities that generate new values, interests and visions as an outcome of participating in niche processes that function as flexible bounded spaces. The development and implementation of the project's new interests and shared vision is at the task level about managing multiple expectations from various sectors of the RD&E system where there is a possibility for a misalignment of values and anticipated outcomes; and expectations that are shaped by actors having different motivations to be involved in a project that has been initiated at the federal level and partially funded through industry partners.

It becomes apparent from our initial review and the forum results that networks are fragmented across Australia's primary industry RD&E system and are in some cases non-existent or struggling, in the case of private sector advisors and producers connecting with the research sub-system. This means there is less chance for multi-directional knowledge flows and the opportunity to coordinate collaborative activities at higher (strategic) levels. This becomes an important issue to address when we consider that informal social networks hold the potential to work beyond bureaucratic/institutional structures that may constrain the forging of novel connections needed to stimulate practices for innovation. Enabling informal or shadow networks to emerge and develop alongside traditional organisational pathways increases the likelihood of new alliances that are inclusive of both customs to allow for routine tasks, such as intellectual property (IP) management, to occur in conjunction with the emergence of new experiences and practices. However, such networks and alliances also build the social capital needed for innovation and provide impetus for doing "business [as] 'unusual'" (Tenywa et al., 2011). The project is responding by actively connecting people (through higher level project governance activities, forums and trials) that would not normally meet together for the purpose of participating in innovation processes and activities. Co-locating a range of RD&E actors to discuss and co-develop a series of pathways for innovation has the potential for new social networks to emerge at both the project and system scale, which may stimulate systemic change as an outcome of working together across sectors and interests.

While generating a shared vision and establishing novel social networks are important at a conceptual and structural level for niche innovation and systemic change, it is the learning processes that provide the substance for innovation and these need careful design and maintenance. Multi-actor learning helps to develop a complex understanding of what needs to change and what needs to be influenced in the system in order for localised learning to move through the system and link with higher order social organisation, structures and processes to operationalise institutional and strategic change. It is important at the project scale that learning from reflections, group discussions and outcomes of the research process are

intentionally captured and fed back into the innovation process so that the system becomes a responsive (adaptive) system of innovation. Some project team members have demonstrated their role as a 'learning historian' or knowledge manager by recording and communicating learning generated from the literature review and forums and creating a feedback loop by reporting back to the project community. However, the risk is that these roles remain within the realm of the project team rather than being adopted by all co-innovators in the system as lead actors in learning and knowledge building within and beyond the life of the project.

In response to this challenge, we envisage the engagement trials to be the sites for enrolling actors from both the private sector and the RDCs in the concerted effort to establish a new collaborative working dynamic as the foundation for self-sustaining co-innovation platforms. Based on the stakeholder workshop and forums, four initial trial proposals have been developed and received strong support from participants. These include increased networking and collaboration in the support of new entrants into the advisory sector; RDCs working with advisers in the value chain; the application of precision agriculture technology; and improved private adviser access to the latest research in real time, while identifying needs and opportunities to aid the interpretation and application of this research in practice. The trials' design methodology stipulates explicitly (pro-)active roles for the participating partners for, first, collectively defining the opportunities for collaboration and, second, establishing co-design and governance processes for intervention in the identified area, following a planning, action and reviewing cycle. Beyond the topic areas of the individual trials, however, it is the establishment of this methodology for collaborative learning and action that has potential to build the foundations for cross-sectoral, public-private co-innovation platforms to operate into the future.

In summary, the trial design responds to these key engagement issues and opportunities observed by the research participants. The analysis of the research findings indicates a need to reframe current RD&E and governance practices from a linear model to a more systemic and networked co-innovation model (AIS). Through their design as co-innovation platforms, the trials make key contributions towards this aim by engaging RDCs and advisers across industries in the creation of a shared vision for innovation, and by creating opportunities for new alliances and multi-actor learning that enrol and empower participants as active agents of change in a shared co-innovation space. At the time of writing, the implementation of the trials in practice is pending. However, the collaborative experience and learning intended and generated by the trials explicitly reframes current RD&E practice as sustained co-innovation practice within the niche (the project); and, while there is no guarantee of transformation at the regime level, these niche practices significantly increase the potential for a regime shift towards collaborative RD&E at the level of the national AIS.

Conclusion

Our discussion outlined the process of establishing the Advisory Project as an 'innovation platform in action' with the aim to collaboratively develop and introduce new practices into the engagement repertoire of key actors in the Australian agricultural RD&E system. In doing so, the paper described challenges emerging from the analysis of the current engagement situation and from the action research process itself. In this way, the research steps to date present a gap analysis of the preconditions for the formation of innovation platforms. Currently, the private sector is being engaged by industry and the public service sector in a range of ways that may be one-off events, part of a fixed term project or institutionalised in organisational structures that regulate and bound the engagement practice within internal

processes. This approach was shown to inhibit the development of a shared cross-sectoral vision for the RD&E system, and to constrain the formation of multiple actor networks and learning processes as the basis of agricultural innovation. The analysis of preliminary findings from the literature and practice review of RDC engagement patterns, and from the forums with private advisers and producers, indicates that the RDC's and private advisers' perceptions of the current RD&E system and their respective roles within the AIS are in misalignment. The discussion outlined the project's action research responses to these challenges, including the approach of involving multi-actor committees in governing aspects of the project and its shared vision, and inviting diverse actor groups to help shape and translate this vision into practice. Importantly, we note that the co-development of four engagement trials enrols both advisers and RDCs as actively collaborative actors in the establishment of four co-innovation platforms that determine the preconditions and provide the space and processes for building experience and envisioning new governance dynamics for the Australian AIS. Acknowledging that the AIS is embedded within Australia's larger socio-technological regime and socio-political landscape, the next challenge becomes how to liberate the experience, practices of engagement and any resulting innovation embedded within the trials and organisational structures of participating actors, in order to build momentum to drive innovation as a process and outcome into the larger system.

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Achieving best-fit in Norway: challenges for advisory services to offer relevant advice to various types of farmers

Stræte, E.P.[1], Klerkx, L.[2], Kvam, G.T.[1], Ystad, E.[3] and Hårstad, R.[1]

[1] *Centre for Rural Research, Trondheim*

[2] *Knowledge, Technology and Innovation Group, Wageningen University*

[3] *Norwegian Institute of Bioeconomy Research*

Abstract: As in other countries, the agricultural knowledge and innovation system (AKIS) in Norway has transformed from a public sector dominated towards a market driven system. This also affects the advisory system within the AKIS. In this ongoing transformation, various types of farmers have various support needs: a full-time farmer using the latest precision agriculture technology may have different needs than a part-time farmer using production methods that are more traditional. A theoretical typology for farmer information searching behaviour based on Jansen et al. (2010) is applied in this paper. The aim of this paper is to present and discuss challenges for advisory service to serve various types of farmers when they search for and acquire advice for their farm business, in light of the discussion on 'best-fit'. The research question of this paper is how they achieve this best-fit and what arrangements emerge. The empirical basis for this paper is workshops and interviews with stakeholders in the Norwegian AKIS, and interviews with progressive farmers. Findings indicate that there are emerging configurations serving the different types of farmers, i.e. private advisors serve different clients in different ways, which could be considered 'sub-systems' within the overall advisory system. The theoretical implications for thinking on best-fit and AKIS are that 'best-fit' systems emerge dynamically and have particular configurations within a country setting, to make advisory service organisation more suited to meet challenges related to various types of farmers.

Keywords: Advisory service, transformation, subsystem, types of farmers, Norway

Introduction

In the past decades, many countries have undergone changes in their farm advisory system such as decentralisation and privatisation, leading to more commercialised farm advisory services (Garforth et al., 2003; Klerkx et al., 2006; Labarthe & Laurent, 2013). While it has been reported that this has led to greater client satisfaction, concerns have also been raised as regards the access of farmers to farm advice and the breadth and depth of topics addressed by farm advisory systems (Klerkx & Proctor, 2013; Labarthe & Laurent, 2013). As the commercialisation of farm advisory services raises challenges related to uneven distribution of farm advice, it may be essential for commercial advisory services to be complemented with other service providers that reach different types of farmers due to the diversity of farming structure and systems (Prager et al., 2016). There is also a need to pay attention to topics which may not have a high private interest but are related to the public good, e.g.

environmental and rural development issues (Klerkx & Jansen, 2010; Vrain & Lovett, 2016). The latter may be challenging if there is no clear orchestration of provisioning of advice on public good related issues (Klerkx & Jansen, 2010; Prager et al., 2016).

As all countries are different in terms of how their agricultural systems and value chains are composed, their governance structures, and their political ambitions for agriculture and rural areas, it has been argued that there is no 'one-size-fits-all' farm advisory system, but that each country should achieve 'best-fit', i.e. "*advisory services that 'best fit' the specific conditions and development priorities of their country"* (Birner et al., 2009, p 343). However, achieving such best fit is challenging (Kilelu et al., 2014), and advisory services must develop and adjust their own organisation, methods and practice to meet the different needs farmers are facing, and connect to different styles and goals of farming (Aguilar-Gallegos et al., 2015; Kilelu et al., 2014; Vanclay et al., 2006). The aim of this paper is to present and discuss challenges for advisory service providers to serve various types of farmers when they search for and acquire advice for their farm business, in light of the discussion on 'best-fit'. The overall research question of this paper is how advisory services achieve this best-fit and what arrangements emerge, with three sub-questions:

RQ1) what different advisory service providers and advisory arrangements exist in Norway?

RQ2) what relationships exist between different kinds of farmers and advisory service providers?

RQ3) how does the Norwegian advisory system respond to challenges in dealing with this diversity and achieving best-fit?

In this paper, we first give a conceptual framing before an empirical description from the Norwegian situation on advisory services. In the discussion and conclusion, we point to the main challenges for advisory services to meet the farmers' needs and some of the solutions they seem to adapt.

Conceptual framework

Diversity in provisioning of farm advisory services

Farm advisory services are defined in this paper as "the entire set of organisations that will enable the farmers to co-produce farm-level solutions by establishing service relationships with advisers so as to produce knowledge and enhance skills". Farm advisory services assist farmers in a broad range of issues, for example technical, financial, business management, ethical (animal welfare), and regulatory issues, which are often interconnected and thus require complementary or joint efforts between several advisors (Klerkx & Jansen, 2010; Phillipson et al., 2016; Proctor et al., 2012). The farm advisory system is a part of the broader Agricultural Knowledge and Innovation System (AKIS) (EU SCAR, 2013).

We follow Prager et al. who make a distinction between 'private' as the status of an organisation, and 'commercial' referring to activities carried out by the organisation (e.g. offering advisory services for a fee) (Prager et al., 2016, p. 330). That farm advisory services are provided by private organisations does not mean they are necessarily commercial, as government often continues to pay for 'public good' advice (Klerkx & Jansen, 2010). Commercial advisory services may be both coupled with selling or 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 only provide advice (called 'independent advisors' by Klerkx and Jansen, 2010). Overall, 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 et al., 2003; Solano et al., 2003).

The literature has indicated some risk moving to purely commercial services. Public good issues, such as environmental advice may not have a pro-active demand and may not be addressed adequately in commercial contacts. Some types of advice for which there is a small demand may no longer be developed and offered or some groups of farmers will not be able to afford services; especially in the case of 'embedded advice' there may be a bias in advice to support sales of goods. There may be a disconnect between research and those that provide advisory services resulting in advisory services not incorporating the latest scientific insights, so there may be fragmentation in the overall AKIS (Ingram, 2008; Klerkx & Jansen, 2010; Prager et al., 2016; Klerkx & Proctor, 2013; Labarthe & Laurent, 2013).

Relationships between different types of farmers and advisors

Farmers are of course not a homogenous entity, and this is relevant and important for advisory services to consider in configuration of their supply (Aguilar-Gallegos et al., 2015; Jansen et al., 2010; Kilelu et al., 2014). There are well-known categories as regards technology and practice adoption of farmers denoting them as innovators, early and late adopters, and laggards (Rogers, 1995) and this 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 these tend to be normatively applied to favour one way of producing over another (Gilles et al., 2013). Various variables and causes, such as farm size, asset status and education, influence the farmers' variation of demand for advisory service (Labarthe & Laurent, 2013; Prager et al., 2016). As Ingram (2008) argues based on her study of promotion of "best management practices", farmers can be more proactive or reactive in their relationship with advisors, and the relationship can either be steered by the advisor, 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. Based on Jansen et al. (2010) in this paper we define an analytical typology with the following types:

- The Pro-activists that are seeking advice actively from advisors;
- The Do-it-yourselfers that go their own way to develop the farming, for example doing experiments or searching for alternative sources of information;
- The Wait-and-see-ers that are seeking advice but to a lesser degree implement this into farming, or at a slower pace;
- The Reclusive traditionalists that do what they have always done or think they know best themselves.

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

Methods

The empirical basis for this paper is ten interviews with farmers in 2014, observation at two workshops in 2015, five interviews with stakeholders in the Norwegian AKIS in 2015, and observation at two training workshops for advisory services in 2016. We have also made use of documents and webpages from advisory services describing the services they offer. The latter is especially important to give an overview of the Norwegian providers.

Ten farmers from the region of Trøndelag in Norway were interviewed through a semi-structured guide with questions on: what kind of advisory service they make use of; how they make use of the advisory service; how satisfied with the service they are; what service they are missing; how it can be improved; how they pay for the service; and how they keep themselves updated in farming. The ten farmers were sampled from a list of farmers made by advisory service staff and public authorities that know the agriculture in the region well. The sampling was done by the researcher to achieve a variation of geography and production. Three women and eight men were interviewed. Their age was between about 30 and 55. Two interviews were done in person and the rest by phone. Interviews were tape-recorded and notes taken during and after the interviews. Details of this study were reported in Norwegian (Stræte, 2014). Not all of the issues in the interview are relevant for this paper but parts are, i.e. the questions mentioned above. These ten farmers are not representative of farmers or types of farmers, neither in Norway nor in the region. They are probably above the average in terms of farm activity and in discussion in farmers' organisations. Ideally, a larger number of farmers with an even larger diversity should have been interviewed but limited resources made that impossible. That is a limitation of the study, and hence participation in workshops was carried out to complement this data and enable triangulation.

The two workshops were organised to address questions related to competence development for farmers and challenges for the advisory service. They were organised with a few keynote speakers, work in groups and plenary discussions. From these workshops the researcher could identify what issues representatives from both the farmers and the advisory service raised, observing what questions and challenges they were emphasising. Data from these workshops were notes taken during and after the activity.

Finally, interviews with five stakeholders from different advisory service organisations were carried out. All organisations are farmer cooperatives. The researchers sampled these stakeholders. These interviews were open but related to what kind of service they offer, their experience from their service, if and how they evaluate, what are the challenges, and what are their strategies.

Findings

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

The Norwegian AKIS and advisory system in transformation

The Agricultural Knowledge and Innovation System (AKIS) in Norway has transformed from a governmental driven strategy with farming and public goods in focus towards a commercialised 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 subsidising and an increasing focus on competitiveness. This radical transformation over the last 30 years also affects the advisory system within the AKIS, e.g. there is a smaller budget for publicly funded advisory services at the county and municipal levels.

A number of key challenges and tensions emerged in this radical transition, such as:

- In governance: less governmental support and responsibility for advisory services, while there is still a political objective to develop agriculture;
- In competencies: both for farmers and advisors there are challenges to follow up and new knowledge and technology to implement. In addition, advisory services are changing working methods from recipe-based problem solving and decision making towards guiding and coaching-based methods;
- In organisation: advisory services need to develop market oriented business models. From initially being free services, farmers more often now have to pay, while the advice organization has to focus on earnings. Such changes also increased the competition among advisory services.

At present the advisory systems consists of:

- Advisors in the input supply industry, often in cooperatives such as *Felleskjøpet Agri* (concentrate, fertiliser, machines and equipment) but also a long list of machinery suppliers and others. This service is provided by organisations that sell to farmers, and in some cases buy;
- Advisors in the food industry, often in cooperatives such as *TINE* (dairy) and *Nortura* (meat). This service is provided by organisations that buy produce from farmers. Especially in the meat sector there are several competitors that to varying degrees also provide advice for farmers;
- Advisors in independent organisations such as the cooperative Norwegian Agricultural Extension Service (NAES)(*Norsk landbruksrådgiving*) but also independent private consultants;
- Advisors related to services like accounting, banks, insurance, breeding organisations, ICT, farmers' unions etc. These services are delivered or sold in addition to other services offered;
- Advisory service provided by governmental and public bodies especially at local and county level.

The agricultural business cooperatives (*TINE, Nortura, Felleskjøpet*) and the cooperative NAES have altogether a comprehensive package of different advisory services. These are tools both for production tasks and financial management, purpose of planning of strategy and management of farm activity, as well as for agronomical operations on the farm. The advisory services are also involved in a range of educational and training actions for farmers, solely or in cooperation with high schools and universities. Table 1 summarises the activities of the main advisory service providers and advisory arrangements in Norway.

Advisory services in these four cooperatives mentioned in Table 1 cooperate now and then, i.e. cooperation between private and public sector, often driven by the private sector (advisory service included) with a majority of funding from the public sector. Examples are 'Green Research' (*Grønn forskning*), that is a regional programme for Mid-Norway. Green Research has among others, established meeting arenas for advisory service, research and farmers; 'Competence boost for agriculture in Trøndelag' (*Kompetanseløft trøndersk landbruk*) organises 'training camps' for advisory services across organisations; RULL in the county of Oppland, is a partnership between farmers' organisations, the county and the county governor, focusing on farmer learning.

Table 1. Main private providers of advisory services in Norway

Name provider	Main target audience	Position of advisors	Type of advises	Tools used	Type of client served, tentative	Way of payment
TINE	Dairy farmers	Embedded but in specific department	Dairy farming, feeding, animal health, milk quality, economy, strategy	One to one, experience groups, meetings for members, packages of advisory for specific issues, web	All types but top teams especially the Pro-active and obligatory meetings to include also Reclusive traditionalists	Combination: One meeting free for members, payment per hour, or advisory package
Nortura	Meat producers (cattle, sheep and goat, hog, and poultry)	Embedded	Meat production, animal health, economy, buildings	One to one, meetings for members, introducing packages	All types but esp. the Pro-active in hog	Normally free[1] for members and potential members but payment for specific deliveries (plan of management etc.)
Felleskjøpet	Farmers in general	Embedded	Concentrates, fertiliser, buildings machinery and equipment	One to one, meetings for members, introducing packages	All types	Normally free for members and potential customers
NAES	Plant producers	Independent	Plant production, soil, organic, economy, strategy, buildings, machinery, landscape, HES	One to one, field show, groups, packages of advisory on specific issues	On to one esp. for the Pro-active in vegetable production. Coordinators mixed with research especially the Pro-active.	Combination: annually member fee, payment per hour or advisory package. About 20 percent of revenue for NAES comes from governmental grants.

[1] *'Free' implies no direct payment, but the cost is covered in the price of the milk sold or other inputs purchased.*

Farmers seeking advice and up-to-date information

There are several sources farmer use to access information and to build their competence (Stræte, 2014). Magazines and newspapers are the most important sources, with other farmers nearby and the internet coming next. Then comes advisors from the Norwegian Agricultural Extension Service followed by advisors in other Norwegian agricultural cooperatives. Nevertheless, they do not always get the support they need. From a representative survey among farmers in Norway, only 29% answered that they as farmers managed to get the required support or find the knowledge they wanted (Stræte, 2014). As argued, the ongoing transformation in agriculture has led to various types of farmers with various support needs; a well-informed pro-active farmer has different needs than a wait-and-see-er farmer using methods that are more traditional.

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

The Pro-activists: this type of farmer makes explicit requests to advisory services. They are often specific in their demands. When they invest in new technology (like AMS) a stronger relationship may be developed through specific packages from the advisory services. As one farmer said: "*I am conscious about 'picking' the right advisors".* From the perspective of advisory service providers this is the 'ideal farmer' that needs to be served well, otherwise they may lose her or him to other companies. These farmers are open to and are actively seeking external information. However, some advisors (and farmers) find that it can be difficult for advisors to meet these farmers' level of competence.

The Do-it-yourselfers: this type of farmer seldom has a strong relation to the advisory service. They even may be in conflict, i.e. confronting the 'official advice' that is regarded as 'the truth', or they "shop" for advice from different sources, including alternative sources as opposed to the conventional ones (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 have mixed views on this type of farmer. On the one hand, these farmers can cause trouble with alternative and often challenging knowledge. On the other hand, they have respect and see a potential to learn more themselves, as it can be an important correction. However, a major challenge is to establish constructive relationships.

The Wait-and-see-ers: this type of farmer can be regarded as the average farmer. They often participate in meetings and other activities organised by the advisory services, and they follow the regular advisory scheme from the advisory service, like annual meetings, doing analyses of fodder, make a fertiliser plan etc. However, they are not swift in implementing new knowledge, as they in general are more closed to external information. Some may need to be challenged to make progress. Advisory service organised group activities may also be used as an arena for social meeting with colleagues. From the perspective of advisors, these farmers seldom cause 'trouble' for the advisory service but there are some specific challenges for advisors. First, some of these farmers need now and then to be challenged by advisors in their farm management if there is a need for improvement or investment. For advisors it

requires specific skill to do this in a balanced way as the farmers have various motivations and ambitions for their farm.

The Reclusive traditionalists: there is in general no active relationship between these farmers and advisory service providers. These farmers seldom make contact with advisory service providers. They generally farm their own way, as they used to do, or they are busy with other activities that make farm development and seeking information less relevant. Advisory service providers indicate it is difficult to get 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 related to the different types of farmers, there are also similarities. The need for advice varies among farmers but among those interviewed were several specialised 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 give farmers stronger challenges. This requires advisors to have both the 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, which is typical for farmers that are strongly 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 expressed the view that such services seem to be missing today.

However, advisors indicated it is not possible for individual advisors to have expertise in everything. There is therefore a trade-off among the advisors to find a balance between specialisation and universality. This carries a risk: the discussions clearly suggest that if farmers do not have access to specialised knowledge, they go abroad to search expertise, which is typical for the Do-it-yourselfer and is also done by Pro-activists. Pro-activists may move towards Do-it-yourselfer if they do not achieve what they want, or 'shop' for knowledge where it is available, at home or abroad. Seen from the advisory position this can be perceived as a failure due to not being 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.

As presented, results from the study indicate that there are challenges for advisory services in meeting demand from the various types of farmers. In the next section we present how new configurations emerge to improve mismatches.

Emergence of 'best-fit' configurations in advisory system

Advisory service organisations are aware of their challenges to respond adequately to the demands from various farmers. Here we present four examples of different demand-supply configurations that emerged in light of dealing with demands from different types of farmers.

- Top team with expertise on feeding. TINE has organised a national team of experts on feeding in dairy farming, who should help the other advisors when needed, hence acting as a resource pool for the advisory service. They also contribute directly on farms with specific problems. This team has direct linkd to ongoing research to ensure being up-to-date.
- Coordinators between advisory and research. NAES has coordinators who are employed both in the advisory service organisation and a research institute (NIBIO).

The purpose is to coordinate communication and activities between the two main actors in specific topics.

- Training on cooperation. The project 'Competence boost for agriculture in Trøndelag' (*Kompetanseløft trøndersk landbruk*) organised 'training camps' for advisory services across organisations. The participating advisors were trained in working together in meetings with farmers. The purpose was to achieve a more holistic perspective on the farm.
- Obligatory meetings between advisor and farmer. TINE provides dairy farmers with a 'key-advisor' as the main contact between the farmer and the advisory service of TINE. Included is an annually obligatory meeting between the farmer and the advisor. At this meeting they go through all aspects of the dairy farm, including a farm inspection. The cost for this advisory service is included in the membership of the cooperative TINE. An important argument for keeping this obligatory meeting is to be sure 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.

In Table 2 the relationships between types of farmers, the 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'.

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

Farmer type	**Examples of challenges for advisory service**	**Examples of new configurations**
The Pro-activists	How to bring in right expertise to meet the specific demand of knowledge?	A) Top-teams of expertise sharing among advisors (*TINE*) B) Coordinators with shared employment in advisory service organisation and in research institute (*NAES*)
The Do-it-yourselfers	How to develop trust in relations to farmers?	No example identified
The Wait-and-see-ers	How to challenge farmers, due to various motivations in farming for farmers?	C) Specific training projects for cooperation between advisory service organisations
The Reclusive traditionalists	How to get in contact with the farmer?	D) Obligatory annual meeting between advisor and farmer (*TINE*)

Table 2 lists identified examples of challenges of where advisory service organisations have made efforts to meet the demands of specific types of farmers. However, the new configurations are not exclusive to the target types. The study has not identified examples of configurations that are specific for challenges related to The Do-it-yourselfers. However, the advisors are very aware of this type of farmer and try to improve their skills for giving service in these cases as well, but without a specific support arrangement.

Public goals as a factor of targeting various farmer types

As indicated in the Conceptual Framework section above, in pluralistic privatised advisory systems addressing public goods can be complicated, and this is why advisory service organisations 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, contributions to rural settlements, environmental goals (Forbord et al., 2014). To do so they are served by support instruments like subsidies, import restrictions and market regulation. All these conditions are regarded as needed to maintain Norwegian agriculture. Advisory service organisations are also aware of this and therefore have an interest in 'taking care of' all types of farmers to enable the agricultural sector to deliver public goods. One way to maintain the interest of public goods is to subsidise private advisory services (i.e. public funding and private delivery). In the Norwegian case, only NAES receive subsidies as a basic funding, mainly for the regional and local units of the organisation. This way of governance can be argued to balance the governmental objectives to stimulate access to advisory services in all regions, with a strategy to be a market oriented advisory service provider.

Discussion and Conclusion: towards subsystems in pluralistic advisory systems?

Advisory services and AKIS in Norway have been transformed from a public service to a highly privatised system. This study shows that advisory services in Norway are concerned about who they are serving, and how they might be able to serve most of the various 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: the Pro-activists, the Do-it-yourselfers, the Wait-and-see-ers, and the Reclusive traditionalists. The results confirm the existence of several farmer-advisor relationships, dependent both on the position and information seeking style of the farmer, and the capability of the farmer, resembling earlier findings of Ingram (2008). Sometimes a good demand-supply match occurs, but in case this does not happen arrangements are put in place to mitigate these weaknesses of the system, i.e. installing advisory systems capacity building which has been described earlier 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 on the emergence of specific configurations of farmers and advisors in the Norwegian advisory system (following earlier ideas from Proctor et al. (2012) and Phillipson et al. (2016)) in view of farmer's dynamic demands (cf. Kilelu et al., 2014). However, rather than being only configurations at the farm level as these authors find, these configurations might be considered 'subsystems' of the advisory service system aimed at achieving 'best-fit' for a particular type of farmer. Based on the results in this study we have identified three types of subsystems:

- *A 'Holistic' subsystem*: this is an inter-organisational system of service supply with cross-over relations between advisory organisations, to provide a more holistic perspective on farming and the service needed to support it. Participating advisory organisations both cooperate and compete. When agreements are made and cooperative routines established, farmers are offered a better advisory service. These systems make it easier for farmers to get access to the 'right' advice. Related to the various farmer types this system may be most helpful for farmers that are not seeking

advice pro-actively. That means Wait-and-see-ers are the target group for this subsystem;

- *An 'Elitist' subsystem*: this subsystem establishes top teams containing a range of expertise to overcome the expertise/generalist-challenge in advisory service organisations. Generalists have first line contact with farmers and when needed they can bring in expertise from these top teams, which can be sourced intra-organisationally or cross-organisationally. This subsystem will be most relevant for farmer types like Pro-activists and Do-it-yourselfers;
- *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), or 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 which is an issue in many privatised systems (cf. Labarthe & Laurent, 2013; Prager et al., 2016). This is a subsystem that serves various types of farmers. 'Green Research', 'Competence boost for agriculture in Trøndelag', and RULL mentioned above are all examples of this type of subsystem.

Beyond confirming diversity in farmer information demand and different kinds of advisory service supply to meet heterogeneous demands, the main theoretical implication of our study is that more attention should be paid to 'subsystems' within advisory systems. As opposed to seeing an advisory system as a national and homogenous system which might have 'best-fit' within a given country setting (Birner et al., 2009) , 'best-fit' systems dynamically emerge and have particular configurations within a country setting in view of types of information seeking of farmers and the public goals of the system. As our results show, and this has an important implication for policy, some of these subsystems are formed mainly because of private action to better serve clients (e.g. the elitist subsystem) and some are connected to public concerns (e.g. farmer exclusion and environmental issues in the public goods subsystem). Hence policy makers should monitor the emergence of these subsystems and become active participants in some of them, in line with ideas of the public sector as 'regulator' of private and commercial advisory systems (cf. Klerkx et al., 2006). Since our findings should be considered tentative, there is a need for more in depth study on a) the constructed typologies of farmer information seeking and the related advisory service demand-supply match for each type; and b) the advisory subsystems, to better explore how they operate and study how stable or dynamic they are, i.e. whether they are permanent subsystems or more temporary configurations.

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Role and interactions of agro-pastoral organisations and finance institutions in agricultural innovation: the study of Rahad Agriculture Scheme - Sudan

Tyseer Elhadi, O.[1], and Boland, H.[2]

[1]*Department of Agricultural Extension and Rural Development, University of Khartoum*

[2]*Department of Rural Sociology and Extension, Justus Liebig University, Giessen.*

Abstract: The Establishment of the Rahad Scheme in Eastern Sudan in the 1970s established an agricultural innovation system where formal actors (such as extension, research and finance institutions) and informal actors (such as agro pastoral organisations) are networking to provide better livelihoods within the irrigated scheme area. This investigation focuses on the roles and interactions of agro pastoral organisations and finance institutions in relation to extension work in the Rahad Scheme. This paper also discusses the challenges that hinder interactions between agro pastoral organisations and finance institutions and makes suggestions as to how to improve such interactions. System thinking was suggested as a methodology to analyse knowledge networking among and between finance institutions and agro pastoral organisations. Social network analysis was used to study connections and relations of agro pastoral organisations and finance institutions in the Rahad Scheme. As a result new connections and relations have been suggested to improve the performance of the agro pastoral organisations and finance institutions in Rahad. The hope is that improvement of connections among the studied actors can lead to better appropriation of the innovation system within the Rahad Scheme.

Keywords: AKIS, RAAKS, SNAS, Rahad Scheme

Introduction

The Rahad Agriculture Scheme was established in 1977 and is situated within 14° 23 – 13° 30 north and 34° 22-35˚55 east. It is located 260 km south east of Khartoum, the capital of Sudan. El-Fau City is the headquarters of the scheme. It is irrigated from two sources, the Rahad River from autumn to summer and the Blue Nile River during winter. The total cultivated area in the scheme is 147,698 hectares (Benedict et al., 1982; Rahad Agriculture Corporation, 2010).

One of the reasons for establishing the Rahad Scheme was to shift the sustainably based economy of indigenous agro-pastorals surrounding the area of the scheme to a more intensified cultivation, as the government of Sudan anticipated that the standard of living – income, housing, nutrition, education, and values of those people – would be improved (Benedict et al., 1982). In accordance with that planning, tenants were settled and allotted farming units of 9.2 hectares to plant cotton, ground nuts and fodder crops. The Ministry of Agriculture in Sudan appointed the Rahad Agricultural Corporation to be the responsible institution for managing the Rahad scheme; the corporation was responsible for providing agriculture inputs and assessing costs against profits, while tenants were responsible for farming the land and would receive profits from their production (Benedict et al., 1982).

Crop combination in the Rahad Scheme was modified according to farmers' needs and economic viability. Therefore, sorghum, sweet corn, wheat, and sunflower were introduced into the scheme (Benedict et al., 1982; Rahad Agriculture Corporation, 2010).

The scheme had undergone many changes since its foundation up until the time of the research study (2010/2011). Shifting the finance of inputs from government to banks and inadequate provision of maintenance for the scheme's assets "canals and machinery" has led to increasing farmer debt and fluctuating productivity (primary data, 2010). Presently a private company has been invited by the government of Sudan to share farming the scheme with the farmers. By the end of the farming season, the cost of production will be calculated at the farm unit level, and net profit will be distributed: 50% for farmers, 40% for the company, and 10% for the improvement of social services within the scheme area (Ministry of Agriculture and Forestry, 2009).

Problem statement

Agriculture innovations in the Rahad Scheme is viewed as a networking of knowledge between formal and informal actors; by formal actors the authors mean research, extension, finance and education institutions in the area of the project; informal actors are pastoral and farmers' organisations, women, youth groups and elderly people. The research conducted in the Rahad Scheme (2010 to 2011) aimed to study knowledge networking among and between the mentioned actors based on the notion of agriculture knowledge and information system. This paper is focusing on reflecting the role of agro pastoral organisations and finance institutions in the Rahad Agriculture Scheme with emphasis on their relation to the Extension Department in the Scheme. Roles of and interactions between those actors are described and suggestions to better their interactions in the Rahad Scheme are also discussed.

Objectives of the paper

1. To present roles and the interactions within agro pastoral organisations and finance institutions in the Rahad Scheme in relation to extension work in the scheme.
2. To explain how these relations are supporting or challenging the performance of agriculture innovations within the Rahad Scheme.
3. To suggest how to improve the interactions within agro-pastoral and finance institutions in the Rahad Scheme

Literature review

Knowledge and information system perspectives to view agricultural innovations

The knowledge and information system is a perspective developed by Roling and others at Wagenningen University (cf. Röling, 1986,1988) cited by Engel (1997).

The perspective views the performance of social organisations of innovations as relationships interplayed between different actors rather than seeing innovation as a technological process that requires certain materialistic inputs and outputs. It is the relationships and integrations of actors that help the performance of the innovations or constrain them (cf. Röling, 1986 and 1988) cited by Engel (1997).

There are many reasons for social scientists to choose the knowledge and information system perspective to study innovations. Firstly, the system has the potential to diagnose the

innovation configuration at macro- and micro-levels. In other words, human actions or relations towards innovations are studied at different levels; perspectives can range from the relationship of two farmers to relationships between agro-business institutions (Engel, 1997). Secondly, it focuses on sharing knowledge among relevant stakeholders and not only on extension as the source of information; policy makers, education, and research institutes are also responsible for disseminating information and ideas so that innovations can bring better technological and social outcomes (Engel 1997). Thirdly, the knowledge and information system perspective has managed to raise radical questions about the classical definition of individuals within agricultural innovations as innovators, adopters, laggards, or worse. Instead, a more comprehensive understanding of human agency through the system perspective is provided, *"What people know and do is intrinsically related."*

Since certain farmers or groups of farmers reject applying certain technologies, there is a need for us to look to surrounding institutions, circumstances and how the farmers are related to them. Moreover, in this regard, issuing of local knowledge and how farmers are deeply related is also vital, and the knowledge and information perspective can be realistically considered (Engel, 1997). .

Finally, according to the knowledge and information perspective, agricultural innovations are *"social efforts that require joint competence of interrelated actors rather than the sum of individual competences"* (Engel, 1997). Since the system can provide a diagnostic framework for analysis and design management of interventions, we thought the perspective can be very useful for approaching our research question; it can first help us study the relationships of actors in the study area and how they communicate information with each other. Furthermore, it can help us suggest a basis for developing approaches to improve the performance of actors in the Rahad Scheme.

Innovations and social networks

Rogers (1983) and Beal & Bohlen (1955) cited by Valente (1995) had earlier stressed that diffusion of innovations is a communication process, because innovation is communicated through certain channels over time among members of a social system. The time factor is essential in these types of innovation models; innovativeness (output of innovations) is correlated by the time of adoption with the level of education, level of income, cosmopolitan status, and contact with change agents (Valente, 1995). The role of actors and their interactions in the settings of innovations had been neglected in those linear models (Valente, 1995; Spielman et al., 2010).

Rural sociological research has developed this classic model of innovation diffusion to other subsets of diffusion known as network models of innovations (Valente, 1995). According to Valente (1995), the network is a pattern of relations that could connect members of social systems; friendship, advice, communication, or supports existing between members are examples. Therefore, diffusion research employing a network perspective (Liu et al., 2005) stems from viewing the structure of the relations among members of the social system as a factor that shapes or constrains the spread of new ideas and practices in the social system (Burt, 1987, cited by Liu et al., 2005).

Thus network models explain innovation diffusion in accordance with the structure of the social system and the communication pattern (who talks to whom) in the social networks (Valente, 1995). These models are also used to decide the flow of personal influence (who influences

whom) (Valente, 1995). Therefore, the relations of a given actor or actors in the network (leadership model) (Colman et al., 1966 cited by Liu et al., 2005) or relations and positions of all actors in the network structural models (Burt, 1987 cited by Liu et al., 2005) can influence the adoption of innovation.

Considering the social network structure as a factor influencing the diffusion of innovations, means that this diffusion can be searched as a relational context in addition to time influence. Researchers believe as Freeman (1984 cited by Trappman et al., 2011) and argue that social network analysis would study how the social structure within the innovation contexts emerged, how it evolved, and how the structure of relations exhibit consequences for behaviour.

Using social networks as a dimension to study innovations is a way to explain complexities in the innovation processes, which leaner models fail to explain (i.e. heterogeneity of actors and their relations) (Spielman, et al., 2010).

Researchers in this study examine the innovation process within the Rahad Scheme by looking at the information flow between different actors that form the social network of the Rahad Scheme (Spielman et al., 2010). This flow of information goes through links connecting actors in the scheme network (Valente,1995; Engel, 1997). Actors' prominence in the network (Liu et al., 2005) and the content of their contacts is assumed by the researchers as the factor that influences the innovativeness in the scheme context.

For the purpose of this paper, the researcher will present the role and flow of information within formal and informal actors in the Rahad Scheme, namely among extension, finance institutions and agro-pastoralist organisations .

Methodology

Knowledge and information system thinking

System thinking is an approach developed by scientists to study the world and how to intervene in it; more specifically, it is an approach to studying agricultural innovations as settings where knowledge and information interact and are exchanged by different stakeholders or actors (Engel, 1997). System thinking may not be the only valid way to do so, but it has been widely adopted by many disciplines (Engel, 1997; see also Röling, 1992). Although there is no agreed definition on what system thinking is in literature, it is referred to as *"an image or metaphor of the adaptive whole, which may be able to survive in a changing environment"* (Scheckland & Scholes, 1990 cited by Engel, 1997).

Knowledge system thinking is a diagnostic approach that would either aim to implement better interventions, or allow an investigator to learn more about the function of the system (Engel, 1997).

There could be many methodologies for understanding the process of innovation in the Rahad Scheme; choosing knowledge system thinking will help one understand the nature of knowledge held by different actors. RAAKS or Rapid Agricultural Appraisal Knowledge System is an empirical methodology to question innovation systems (Scheckland & Scholes, 1990 cited by Engel, 1997). RAAKS is a tested, participatory action research methodology used to approach agricultural innovations with change, but it does not give direct answers to innovation problems (Salomon & Engel, 1997). RAAKS is implemented in phases; each phase has its

constructed images or windows to diagnose and better organise innovative performance of studied actors. (Salomon and Engel, 1997; see also Hulesboch, 2001).

To reflect the focus of this paper results of RAAKS and SNAS will be used to show the suggestions to improve knowledge and information systems within the Rahad Scheme, mainly among agro pastoral organisations; Farmers Union, Pastoral Union, Farmers Committees and Finance Institutions represented on the Sudanese Agricultural Bank and Saving and Investment Bank. Improvement in the interactions of those actors in this paper is discussed in relation to extension work in the Rahad.

Social network analysis

Social network analysis is a methodological perspective that has been developed within the social sciences. Social network analysis stems from the importance of the relations connecting interacting entities (Wassermann & Faust, 1994; Scott, 2000). It considers individual entities and the relations connecting them as the unit of the analysis (Wassermann and Faust, 1994). Those individual entities could be individuals, groups of the same type, or different types. Entities in social network analysis are called actors, who are connected to others with relations (Wasserman & Faust, 1994). Relations connecting actors are known as relational ties (there could be different kinds of relations connecting actors, i.e. biological relations, affiliations, behavioural interactions, etc.). Therefore, measurements of social network analysis are suitable for use in analysing innovation systems based on a network perspective. The measurements used by the researchers for social network analysis are density, centrality of formal actors and informal actors, strength and weakness of relations of actors. For the purpose of this paper, authors will present the type of relation between some of the formal actors and some of the informal actors - mainly extension, financial institutions and agro-pastoral organisations in the Rahad Scheme.

Use of RAAKS by the researcher in the Rahad agricultural scheme

To conduct RAAKS in the Rahad Scheme (see Figure 1), we considered that within the Rahad Scheme information flows among and between different social actors within the innovation. This flow of information materialises in certain communications and relations among the actors. This networking characterises actors' performance in the innovation over time. Knowing that the Rahad Scheme is an innovation that has been implemented by formal institutions for agro-pastoral communities to practice irrigated farming, the situation by necessity poses an interesting question of how communication and coordination have been taking place between those different actors in order to realise the Rahad Scheme. Conducting a RAAKS study by interviewing local and formal actors will help us understand how actors have been networking in order to facilitate the innovation, and then we can eventually formulate proper strategies for improving actors' networking.

Actors at the level of the Rahad Scheme are institutions whose members represent the Rahad scheme management, government, extension, research, education and investment. These institutions have to be concerned with agricultural innovation in Rahad. This imagined picture allowed us to include wide categories of actors within the scheme.

Actors at the level of villages are the individuals and associations that are identified as the agro-pastorals, who were the focus during implementation of the Rahad agricultural scheme. This imagined picture of local actors in Rahad allowed us to include wide categories of those actors within the scheme: agro-pastorals and their associations, women's groups, youth

groups, and elderly people. In this paper some of actors are considered as private sector, mainly agro-pastoral organisations

Phases of RAAKS in the Rahad Scheme

Phase A

To get a general understanding of knowledge networking among social actors in the Rahad scheme, or to clarify our problems on how the relationship and communication between formal actors and local actors in Rahad are taking place, we used most windows of phase A and selected windows of phase B; that is to say we investigated who were actors in the Rahad scheme, what are their roles, objectives, and tasks (what they actually do), how they perceive the performance of the scheme within the given social, political, and ecological environment surrounding the scheme, what sources of information are available to them, and what cultural communication problems exist between them. The team managed to interview 15 relevant actors within the Rahad scheme in the first phase of RAAKS, and did one brainstorming session with eight actors who managed to show up.

Phase B

To get a more precise picture of Rahad actors' networking, we conducted key informant interviews and group discussions with local actors in the Rahad scheme. The team did 32 individual interviews, and 11 group discussions. The reason to have this number of interviews in qualitative research is due to the geographical and social combination of the Rahad scheme. The scheme is divided into three areas: north, middle and south, and populated with different ethnic groups (see Literature section).

Phase C

In order to improve the performance of the Rahad scheme, the researcher suggests that actors need to manage their knowledge of farming and livestock keeping within the scheme. Knowledge management is the "*initiation, direction, and control of purposeful activities"* (Van Hack cited by Engel, 1997). Knowledge management can be a future activity for actors of the Rahad Irrigated Scheme. It can be implemented in two stages. First they need to conduct a training workshop where actors can decide the need to categorise their knowledge management tasks, find out which of the actors are policy makers, which are project designers, etc. (Engel, 1997). Actors need to define whom each actor needs to contact in order to do the task, and why (Engel, 1997). Then actors at the scheme level need to define which of the actors at the village level are their respective contacts or beneficiaries (Engel, 1997) . The next step of phase C, extension in the Rahad scheme, is suggested to weave connections and create relations at different levels within the scheme (Krebs & Holley, 2002).

Sampling

Purposive sampling was conducted, as the researcher aimed to include actors concerned with innovations achieved by the Rahad Scheme (Bryman, 2001). After approaching the Rahad Scheme administration, researchers decided to conduct snowball sampling in order to interview actors within the scheme (Bryman, 2001). Snowball sampling allowed the researchers to move from one actor to the next during interviews by asking "Who else do you think is involved with agricultural innovation in the Rahad Scheme?" A structured questionnaire was used with 15 actors defined by snowball sampling using individual interviewing in order to collect information on actors roles and objectives (Phase A of RAAKS). To collect information at the village level, in key informant interviewing and group discussions were conducted using purposive sampling technique to collect information on type of relations

between actors at the village level (informal actors; Phase B of RAAKS). However, for the purposes of this paper, the researcher is presenting the results of 6 main actors representing the roles and flow of knowledge and information within the scheme namely: Extension Department in Rahad Schemes; Sudanese Agricultural Bank; Saving and Investment Bank; Farmers' Union; Pastoral Unions and Farmers' Committees.

Data analysis

The researcher used Maxqda 10, which is a software method to analyse and interpret textual data (IVERB, 2007).

Maxqda helped the researcher process content analysis (Corbin & Strauss, 2008) for data collected using semi-structured interviews and group discussions (Bryman, 2001).

Maxqda 10 was used to analyse data on the roles of the 6 relevant actors (RAAKS Phase A). The researcher developed codes and sub-codes as the raw data from interviews was divided into different conceptual levels so that meanings could be inferred out of the textual content (Corbin & Strauss, 2008). Meanings of texts were merged and compared using the technique of retrieved codes in Maxqda 10 (IVERB, 2007). Finally, concluding points or summaries of actors' roles were drawn by the researcher's consensus and thoughts.

Codes of the 6 actors' roles were the sources of actors' knowledge, and the type of knowledge. The sources of actors' knowledge were divided into sub-codes of formal source of knowledge and informal source of knowledge.

The type of knowledge was divided into knowledge of cropping, knowledge of livestock keeping, and knowledge of organisational skills.

Analysis of social networks

Relation examined is the relation between actors at the Rahad Scheme level and actors at villages (formal and informal actors). Ties between actors at two levels can be financial support, exchange of information on farming, and social services within the Rahad Scheme. In other words, the transaction networks and discrete networks that involve flows of information and services on farming and livestock keeping between actors at the level of the Rahad Scheme and actors at the village level (Conway and Steward, 1998; Borgatti, 2009). Connections between the two different levels of actors had been studied based on the weakness and strength of the connection. Two actors are strongly connected if they are connected together with more than one tie or a relationship; if they are connected through one tie they are considered weakly connected. If actors expressed less emotional intensity between them, they are considered weakly connected and vise versa (Granovetter 1973; Baer; 2010). In the Rahad Scheme network, valued graphs have been used by researchers to indicate the strengths and weaknesses of actors' relations using Netdraw software program techniques (Borgatti & Freeman, 2002). (Figure 1).

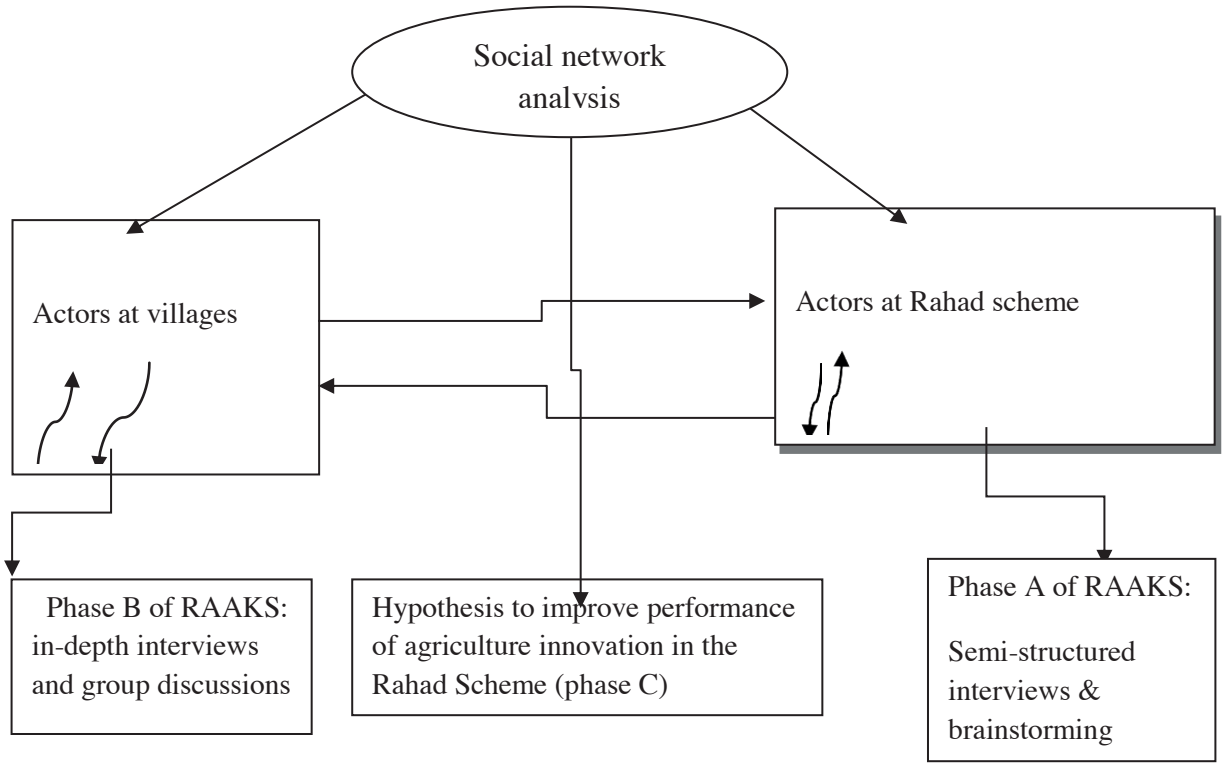

Figure 1. The research design indicating how researchers conducted RAAKS in the Rahad Scheme. *Actors at the Rahad Scheme means the the Rahad Scheme Administration, ministries, research institutes, education institutes and investment. Actors at the villages' scheme are individuals and associations of agro-pastorals (private sector) settled to practice irrigated farming.*

Understanding the flow of information within and among both actors will improve the performance of agricultural innovation. Social network analysis is used to analyse part of the RAAKS research study.

Results and Discussion

The Role of actors at the Rahad Scheme administration level

The Extension and Technology Transfer Department in the Rahad Scheme
This Department is responsible for running extensional approaches to farmers; three extension approaches are conducted in the Rahad Scheme:
Commodity Approach;
Training & Visit Approach (T&V) (World Bank);
Farmers' Field School (Food Agriculture Organisation).

The commodity approach (or field inspector approach) already existed in the Gezira Scheme; the approach was designed with inspectors (the term "extension" was not used) who were responsible for demonstrating to farmers the needed farm operations. Reviewed literature on

the field inspector approach or commodity approach proved that instructing agricultural practices resulted in poor feedback from farmers, since the farmers had no way just to adopt agricultural packages. Extension linkages with the Research Station were not formally constructed; research results were not applied to farm operations.

The T&V approach in the Rahad scheme established formal linkages and feedback with the Rahad Research Station. However, the approach mainly depended on support from international agencies such as the World Bank. Therefore, withdrawal of that support resulted in ceasing activities of the T&V approach.

The last extensional approach in the Rahad Scheme was the Farmers' Field School. The FFS held in the Rahad Scheme was characterised by poor attendance of farmers and a low number of training sessions. Shortages of irrigation water and lack of financing at the time could have discouraged farmers from attending. Therefore, implementation of FFS in the Rahad Scheme, in the researcher's opinion, was concurrent with technical and financial degradation in the Rahad Scheme.

Extension in the Rahad Scheme thus went back to a conventional approach until the time of data collection. Interviewed extensionists believed that a new way of extension needed to be considered. They also mentioned issues such as the fact that renting or sharing farmland with labourers had helped increase farmers' absence from farms and lessened the contact of farmers with extensionists. The researcher argues that extension approaches implemented in the Rahad Scheme were designed based on individual models of diffusion of innovations, meaning that performance of farming in the Rahad Scheme depended on individual farmers adopting the required farming activities (Leeuwis, 2004; Engel, 1997). In order to improve extension performance in the Rahad Scheme, it is important to view adoption of innovations as a complex process that involves communication and networking of different actors who can be sources of different information and knowledge on farming and not focused on individual farmers' performances. In order to make this situation happen, networking of relations among actors is suggested by the researcher as a first step.

The Sudanese Agricultural Bank

Since the establishment of the Rahad Scheme, the Bank of Sudan has provided credits or loans to the Rahad Agricultural Corporation and other agricultural corporations to finance farming operations every season (El Amin & El Mak, 1997). The Rahad Corporation would recover land and water charges from farmers for cotton only, and other crops were freely charged (El Amin & El Mak, 1997). Farmers recognised this process as farming by subsidy from the government, but officially this economic policy was known as the Economic Recovery Programme (El Amin & El Mak, 1997). The ERCP resulted in an accumulation of debt in agricultural corporations including the Rahad Agricultural Corporation (El Amin & El Mak, 1997). The government of Sudan enacted the National Economic Salvation Programme; its policy measures in the agricultural sector were to remove subsidies on fertilisers, pesticides, land and water provided by the agricultural corporations (El Amin & El Mak, 1997). Financing production costs was shifted to commercial banks instead of the state-run Bank of Sudan (El Amin & El Mak, 1997). According to the Agricultural Bank actor, when the government stopped financing, farmers came to the bank (interview 4, paragraph 13).

The Sudanese Agricultural Bank as a developmental bank uses its human and technical resources to achieve agricultural and animal development (Sudanese Agricultural Bank,

2009). This aim is achieved through the presence of bank branches within producing sectors that offer financial, extensional, and banking services (Sudanese Agricultural Bank, 2009).

Since 1991, the Sudanese Agricultural Bank has financed farmers within irrigated schemes and farmers at rain-fed areas in all type of crops (El Amin & El Mak, 1997). For example, for cotton crops the bank would finance all farming operations by supporting inputs of seeds, fertiliser, and the cost of spraying the cotton with chemicals (interview 4, paragraphs 2, 3).

The bank monitors this financing through control groups (farmers are divided into groups; every group will be headed by a farmer, usually a member of the farmer's committee; the farmer would receive the inputs on behalf of his group and hand it to members).The bankers in the finance section report the costs of finance for every group, and the head of the group acts as the contact person (interview 4, paragraph 2). The bank decides the amount of money needed from the head of the group. Money is collected from the groups of the farmers, while the bank calculates the cost. If farmers manage to pay their input costs and make a profit from their produce, the bank returns their profits. Farmers who produce amounts that fail to make profits must repay the cost of inputs (interview 4, paragraph 2). In some cases farmers produced amounts that did not allow them to pay the production costs. Usually, the Rahad Scheme Administration would be responsible for the farmers and would pay the finance costs if farmers failed to pay (interview4, paragraph 2).

Financing farmers at the scheme level is considered a micro-finance that benefits many people with relatively little money (interview 4, paragraph 3). The other type of financing banks' practice is macro-finance (interview 4, paragraph 3). This type of financing is approached with farmers in rain-fed areas within the El Fau locality. Farmers who apply for financing at this sector usually have a massive piece of land (a farmer can own 410 -1,255 hectares) (interview 4, pargraph5). Reports on rain-fed farming stated that individuals own around 50 hectares on average (UNEP, 2006; CFSAM, 2011). Therefore, this type of finance is directed to large-scale farmers within rain-fed farming areas. In macro-financing the farmer would be asked to open a running account, his land would be checked, he would be given fuel, the cost of land preparation, the cost of seeds, and fertiliser (interview 4, paragraph 5). On the other hand, farmers had to mortgage their land to cover 70% of the cost in case they failed to pay the bank input costs (interview 4, paragraph 5).

The Agricultural Bank is expanding its financing from the farming sector to include other social domains (interview 4, paragraph 3), e.g. financing livestock for families. This activity was called the finance of producing families and first offered to families working within the Rahad Scheme, teachers, or health officers in El Fau city (interview 4, paragraph 3).

The family will be asked to open an account, then be given two cows and asked to pay back in two years with low monthly payments (interview 4, paragraph 3). Another project was to buy male goats to improve the breed; the family would borrow the goat and pay 20 cents per month for one year (interview 4, paragraph 3).

The bank introduced oil grinding in villages (small machines locally manufactured to grind oil seeds such as groundnuts); in every village there would be 3-4 local grinders (interview 4, paragraph 3). Financing small enterprises such as biscuit machines and sewing machines was also practised by the bank (interview 4, paragraph 3). Trade was also financed, for

example, money to merchants to buy sugar and flour (interview 4, paragraph 3). They also financed construction materials for building houses (interview 4, paragraph 3).

Women are among those who are financed by the bank, but they are financed individually, meaning that the bank up until now has not financed women's groups (interview 4, paragraph 9). According to the actor, in 90% of cases where women were financed, women would pay the cost of inputs back (interview 4, paragraph 9). The actor further mentioned that women are interested in getting financed for building houses and establishing kindergartens; therefore, the bank finances these categories for women (interview 4, paragraph 9).

The Savings and Social Development Bank

The aim of the Saving and Social Development Bank is to finance a limited slice of people or families with limited income whom are also called small producers by the bank (interview 4, paragraph 22) (Savings and Social Development Bank, 2012). According to the actor, the individual has a limited income, and he or she gets nomore than five Euros per day (interview 4, paragraph 26).

The bank uses micro-finance policy to increase people's income, which will reflect on the economic growth of the community in the area (interview 4, paragraph 22) (Savings and Social Development Bank, 2012). The common activities for people within El Fau are farming and animal rearing (interview 4, paragraph 31), so the bank mainly finances these two activities (interview 4, paragraph 31).

However, financing is also limited to active people who are well-experienced in farming and animal keeping (interview 4, paragraph 22). Before launching the project for an agent, the bank will collect information on the agent's income or financial status, what activity the agent is doing, and the relevance of the agent's activity to the project to be financed (interview 4, paragraph 22). The bank finances projects either run by individuals or groups (interview 4, paragraph 42) (Saving and Social Development Bank, 2012).

Financing of groups takes place as follows: members of the association elect members of the executive office, usually three; the three will deal with the bank and sign papers (interview 4, paragraph 47) (Saving and Social Development Bank, 2012).

Most of the associations financed are pastoral associations and women's associations; there are around seven pastoral associations (interview 4, paragraph 44) and only one association for working women called AmnaEltyeb (interview 4, paragraph 53). In our second field work, we found out that there were around 10 new women's associations in addition to the women's union that were registered and financed for different projects by the bank (livestock, trading projects and electric products) (interview 77, paragraph 31). The actor said the aim was to have 60% of finance projects go to women, (interview 4, and paragraph 53) (Saving and Social Development Bank, 2012). After financing a certain project, the bank would follow the payment through executives of the association (interview 4, paragraph 47). The actor considers itself as a pioneer and specializes in micro-financing in the area (interview 4, paragraph 23). Concerning the actor's relation to the Rahad Scheme, the actor is not directly linked with the corporation, but the bank is directly connected with farmers and families that directly benefit from the scheme, farmers, and the staff of the scheme (interview 4, paragraph 33).

Rahad Scheme Farmers' Union

The Rahad Scheme Farmers' Union was first established in the southern part of the scheme in the form of a starting committee. Then when the establishment of the scheme finished in 1982, a comprehensive union representing the geographical expansion of the scheme was formed (interview 11, paragraph 3). The composition of the union is as follows: the base of the union is the general assembly, every village has a general assembly, and every village will select a production committee of 10 persons called the production council for the village. The 10 members of the production council of the village are divided into a four-person central committee and a six-person production committee; the village council has a president, secretary, treasurer and members (interview 11, paragraph 3).

All farmers in the scheme (minimum should be around 500 persons) will meet to form a central committee. This committee is formed as follows: every village will select four people; the total will be 184 persons (4 x 46 villages). This number will select 24 people as the executive office; this office should be representative for all villages in the scheme (interview 11, paragraph 3).

Members of the executive committee in the union have authority to instruct services to the section committees (interview 11, paragraph 4). The section committee is a committee consisting of 10 persons selected at the level of the section and headed by the head of the section (interview 11, paragraph 4). The section committees instruct farmer committees at the village level.

These executives will hold a meeting with the central committee to select the president, secretary and the general secretary of the whole union (interview11, paragraph3). There are also committees formed within the executive council of the union called the service committees: i.e. the electricity committee, personnel committee, union building committee, and water committee. These committees are formed to respond to the needs of villagers in the scheme (interview 11, paragraph 3). Three members of the executive council are members on the administrative council of the scheme. Usually they are the general secretary, the treasurer, and the head of the union (interview11, paragraph4).

According to the Farmers' Union actor, the executives of the union attend meetings with the administrative council of the scheme (interview 11, paragraph 4). In these meetings, the union representative is able to supervise input supply to the farmers and money circulation within the scheme (interview 11, paragraph 4).

The Rahad Farmers' Union finances social services for scheme villages by deducting a certain share from farm production - 2% (interview 11, paragraph 6). Coordination of these finances goes through a share with the Department of Social Services and development in the Rahad Scheme and a share with the El Fau locality (interview 11, paragraph 6). The Department of Social Services provides its technical views in implementing the services (interview 46, paragraph 4), and the El Fau locality provides the administrative side of implementing the services along with funds from the state (interview 11, paragraph 6). Involvement of the Rahad Farmers' Union in social services goes through the services committees in the administrative council and the section committees (who are the representatives of farmers' committees at the section level).

The section committee has the right to suggest programmes according to the needs of the section and specifically hands the administrative council their proposals (interview 11,

paragraph 4). The administrative council discusses with the Department of Social Development and develops the proposals in the Rahad scheme[1] (interview 11, paragraph 4).

Involvement of the Farmers' Union in providing such social services in the Rahad Scheme villages is actually a part of the objectives and roles attributed to the Sudanese National Farmers' Union (Abd Elrahim, 2011). See Figure 1 to follow representation of the Rahad Scheme Farmers' Union from village level to administration level.

The Farmers' Union in the Rahad Scheme has been among the decision makers for the privatisation of the scheme; the secretary of the Farmers' Union is a member of the High Council of Agricultural Development, which is a political body containing politicians at the presidential level (interview 11, paragraph 15). This council suggested private companies as alternatives for managing national schemes, among them the Rahad Scheme (interview 11, paragraph 15). Involvement of the Farmers' Union in this decision indicates the polytypical role of the union in the Rahad Scheme (Abd Elrahim, 2011). At the state level, the Rahad Scheme Farmers' Union and the rain-fed Farmers' Union represent the General Union of Sudanese Farmers (Abd Elrahim, 2011).

The Pastoral Union

The Pastoral Union in El Fau is a part of the National Pastoral Union, which was established in 1992 and is situated in Khartoum (interview 45, paragraph 4) (Baraka, 2012). The National Pastoral Union consists of unions in different states. At the state level there will be a Pastoral Union representing unions from different localities, and the Pastoral Union at the locality level consists of members of pastorals in villages (interview 5, paragraph 7) (Baraka, 2012). In El Fau, the pastoral union consists of 12 members: four of them will be representatives in Gedarifstate (400 km east of Khartoum, the capital of Sudan) and around 38 members at the state level will represent the state in the centre (interview 5, paragraph 15). Moreover, the Pastoral Union in the El Fau locality deals with problems or issues within rain-fed farms and the Rahad Scheme farms (according to geographical sections of the El Fau locality, there are representatives of the Pastoral Union who represent pastorals in rain-fed farms and Scheme farms) (interview 2, paragraph 58). The head of the Pastoral Union in Khartoum mentioned that the union is an organisation that aims to improve human beings (the pastorals), animals, and pastures. This main goal will be achieved by providing social services for pastorals (health and education), improving access to pathways, providing proper veterinary services and water points for pastorals (interview 45, paragraphs 5-8).

The actor from the Pastoral Union in El Fau reflected many problems as *status quo* that the actor is looking forward to change (interview 5, paragraph 8). Changing this problematic situation so far represents the current perceived role the union is responsible for.

In 2010, a law was launched to organise the production of farming and animal grazing in Sudan's Ministry of Justice (Ministry of Justice, 2011). This law is known as the law of owners of agriculture and animal production (Ministry of Justice, 2011). According to this law, farmers and pastorals are considered one sector of economic production (Ministry of Justice, 2011). For example, the Pastoral Union and Rahad Farmers' Union is one unit of production. The

[1]*From interviews at the field level, we understood that within the Rahad scheme there is an administration for social development that conducts technical assistance with the section committee. They coordinate with the Farmers' Union to suggest proposals for rehabilitation or to establish social services in the villages of the scheme*.

regularities of this law are in its developing stages and there are no cultivated experiences on the ground yet.

The Role of actors at village level

Farmers' Committees

The Farmers' Union is connected to farmers through farmers' committees. The composition of the farmers' committee is as follows: the base of the Farmers' Union is the general assembly, every village has a general assembly, and every village will select a committee of ten persons who are called the village council. The ten-person village council is divided into four people as a central committee and six as the farmers' committee, sometimes called the production committee of the village. The village council has a president, secretary, treasurer, and members (interview 11, paragraph 3).

Farmers' committees are responsible for linking farmers with the extensionists. Some information is communicated from extensionists to the farmers' committee and then to the farmers (interview 23, paragraph 8).

Agricultural policies are formed at the level of the High Council of Agricultural Development, and the Federal Farmers' Union in Khartoum. These institutions decide which crops will be planted and discuss the types of financial resources to be used for farming. The decisions are then passed on to the section committees, then to the farmers' committees, and finally to the farmers (interview 23, paragraph 8)(CEM, 2009; Abd Elrahim, 2011).

Some interviewed farmers have recognised the role of farmers' committees in directing farmers, providing information on farms, and in mosques or clubs (interview 24, paragraph 39).

The role of farmers' committees in solving the problem of animals intruding onto farms has been recognised by some farmers*. "The farmers' committee is only useful in damage estimation, and we even share them or include them according to the* aurf *(tradition and norms). If you are on the production committee, that means you are from good people in the village so we go and ask them to help you estimate the damage on the farm (if crops were attacked by an animal). In the past we used to ask farmers' committees for technical management such as watering crops"* (interview 18, paragraph 65). However, other farmers think the farmers' committees are distant from farmers and mentioned that they farm with no directions from them because the farmers' committee itself is a way of decision making inside the Farmers' Union (interview 18, paragraph 64).

So it could be concluded that power issues dominate the relationship or the connection between the farmers' committees and the executive of the Farmers' Union.

Interactions of actors at the Rahad scheme level and actors at the village level

Connection of farmers' committees to the Rahad Scheme Administration (extension work)

Farmers' committees are connected to the Rahad Scheme administration through their connection to extension agents. (The farmers' committee described its role as a link between extension in the scheme and the farmers or local bridges (Easely & Kleinberg, 2010) (interview 53, paragraph 5; interview 21, paragraph 6). One farmers' committee member mentioned,

"Our role is to link farmers with the administrators, or we are mediators between the farmer and the administration, and then we deliver the extension message from the administrators to the farmers" (interview23, paragraph8). This quote reflects a classical view of extension as a message to deliver. Meanwhile extension can be looked at as advisory work in problem-solving situations as in Hoffman et al. (2009). The extension role has also been thought of as a facilitator for innovations in order to achieve innovation objectives (Leeuwis, 2004; Cristovao et al., 2012). In this regard, extension can be a knowledge broker working in a platform that collects actors involved in the agricultural innovations in the Rahad Scheme.

Farmers' committees also expressed that they not only communicate information to farmers but also help farmers get financing from banks, as they personally guarantee farmers (ref. group finance from the Agricultural Bank) (interview 23, paragraph 9).

Farmers' committees are also connected to the Rahad Scheme through their connection to the administration of social development. The administration shares roles with the Farmers' Union and Rahad Corporation scheme. It is financed by the Farmers' Union and Rahad Corporation. The Rahad Corporation is responsible for the staff and running costs of offices, cars and fuel while the Farmers' Union is supposed to cut around 5 pounds (80 cents) from farm produce for every farmer to finance social services The administration coordinates with farmers' committees the assessment of social services needed by the villages (interview46, paragraph3). In this respect farmers' committees are the direct contacts of the Farmers' Union who deal with the section to decide what money each village will need. The section delivers the money to the head of the farmers' committee to use (interview 46, paragraph5).

Villages mostly decide to build schools and mosques, unless there are problems coming up. Most people decide to have schools and mosques; others prefer kindergartens and women's centres (interview 46, paragraph5). Accordingly the connection of famers' committees to the Rahad Scheme is a strong one. Reviewed literature has also proved that strongly connected actors are also important in sharing information within the networks. According to Granovetter (1983), the speed of information flow and credibility of information are greater through strong ties. Therefore, the researcher argues that since farmers' committees have connections with more actors in the network, more information can be accessed from them. For example, creating a relationship between the Pastoral Union and farmers' committees can lead to access to more information and better possibilities for animal keepers within the Rahad Scheme.

Connection of farmers' committees to the Farmers' Union

Interviewed farmers' committee members have expressed themselves as people who communicate information from the extensionists or Farmers' Union to the farmers (interview20, paragraph25; interview 21, paragraph 6) (Conway & Steward, 1998; Borgatti, 2009).

The following quote was made by a farmers' committee member explaining their role, *"we are close to farmers in order to communicate information from the section or Farmers' Union to farmers. We follow the farming and watering, and if there are emergencies, we follow them. In the end we follow the harvest with farmers as well. We sometimes connect the farmer with farm administrators, i.e. if there are problems; we solve them with administrators or the Farmers' Union)* (interview 21, paragraph 6).

Accordingly the connection between the Farmers' Union and farmers' committees is considered a strong one. However, from other interviews with farmers and farmers' committee members the RAAKS team understood that the farmers' committees are not always informed of decisions made by executives of the unions. One farmer mentioned: *"the Farmers' Union is distant from production committees. When they went to meet them for some issues or problems related to farming, they would not find them. The Farmers' Union is busy with its own issues"* (interview18, paragraph 60). Analysis of the results for actors at the Rahad scheme level found that the Farmers' Union is a central actor in the network (in-closeness: 73.6, out-closeness: 73.6) (Freeman, 1979 cited by Scott, 2000). The high centrality of the actors was an indicator of actors' power effects in the network (Hannenman & Riddle, 2005). Therefore, the researcher assumes that power issues dominate the relationship or the connection between farmers' committees and the executive of the Farmers' Union.

Connection of farmers' committees to the Sudanese Agricultural Bank

Farmers' committees and the Sudanese Agricultural Bank have mentioned a connection to each other around facilitating the financing of production costs to farmers in the Rahad Scheme. Since it is a single type of connection it can be said that the relationship between farmers' committees and the Sudanese Agriculture Bank is weak. The following section explains the relationship. The Agricultural Bank finances irrigated scheme farmers and rain-fed farmers in all type of crops e.g. for cotton crops the bank finances all farming operations by supporting the input of seeds, fertiliser, and the cost of spraying cotton with pesticides (interview 4, paragraphs 2, 3).

The bank will monitor this financing through control groups. Farmers are divided into groups; every group will be headed by a farmer, usually a member of the farmers' committee. The farmer receives the inputs on behalf of his group and hands it to members. The bankers in the finance section report the costs of financing for every group, and then the head of the group acts as the contact person (interview 4, paragraph 2). The bank decides the amount of money needed from the head of the group. Money will be collected from the groups of farmers. The bank will calculate its cost. However, farmers' committees have suggested that the bank needs to produce services of micro finance project to finance animal raising activities in the area of the scheme. In this regard the Extension department in the Rahad Scheme can facilitate this service by raising awareness and farmers' committees can organise farmers to make use of the service.

Connection of farmers' committees to the Pastoral Union

One interviewed farmers' committee member was asked about his opinion of the Pastoral Union. He mentioned that *"animals are grazing in farms of the scheme according to certain instructions developed by the scheme administration. The Pastoral Union does what it can to get involved in this or to re-organise the animals grazing"* (interview 21, paragraph 53). This statement indicates no negative feelings from farmers' committees towards the role of the Pastoral Union in the scheme, in contrast to the views of the Farmers' Union representative on the Pastoral Union.

Another interviewed farmers' committee member knew about the Pastoral Union in the village but did not know exactly what they were doing (interview 53, paragraph 25). Another interviewed farmers' committee member in a group discussion said the relationship between people or farmers with larger amounts of animals and farmers with fewer animals in the Rahad Scheme is good because the owners of animals can buy crop residue (interview 23, paragraph

47). Pastoral Union members have admitted the complementary relationship of pastorals' and farmers' activities on farms, but they negatively comment on the Rahad Scheme administration on issues of animal grazing within the scheme farms (interview23, paragraph 49; interview 5, paragraph 12; interview 44, paragraph 6). A member of the Pastoral Union at the village level who was a brother of a farmers' committee member mentioned: *"in order to better coordinate or organise the relationship between farming activities and grazing activities in scheme farms, the Pastoral Union should be involved or represented in farmers' committees."* According to him, pastorals were never represented in the administration of the scheme (interview 44, paragraph 18).

Therefore, it can be argued that, at the farm level the relationship between farmers' committees and the Pastoral Union is not expressed as a negative relationship, but there are no official connections between them. Moreover, farmers' committees are not fully aware of Pastoral Union issues or what exactly the Pastoral Union is doing. Therefore, the connection of farmers' committees and the Pastoral Union is weak .The Pastoral Union actor mentioned the necessity of getting his union to participate in the work of farmers' committees at the village level. This could be a first stage to build connections between the Pastoral Union and farmers' committees in organising grazing activities within the Rahad Scheme. This suggestion as discussed in other sections can be an idea for creating a connection between actors to get access to diverse information in the Rahad Scheme.

Conclusion

Extension approaches used in the Rahad Scheme were financed and supported by international agencies, and there have been no national extension approaches directed towards extension work within irrigated schemes including the Rahad Scheme. Therefore, farmers, extension and research connections worked well according to the objectives of these extension approaches, mainly T&V and FFS approaches. In order to improve the relationship between extension work and farmers, the extension department needs to create knowledge sharing between different farming practices, for example, exchanging information on extension approaches used in other parts of the country and considering rain-fed farming practices within irrigated farming practices. Considering rain-fed farming is important because farmers in the Rahad Scheme relate their knowledge on farming to their parents' or formal experiences within rain-fed farming.

The Farmers' Union and Pastoral Union are related negatively to each other in regards to livestock keeping and farming activities. Each actor had their own ideas about the better function of farming and animal keeping in the area. Therefore, both actors communicate poorly on these issues. To facilitate communication between both actors, there is a need to create connections between them. This connection can start from the village level and the Rahad Scheme level. The Extension and Technology Transfer Department in the Rahad Scheme can work to create the linkages between both actors at the Administration of Rahad Scheme level, while farmers' committees can weave connections between the Farmers' Union and Pastoral Union at village level.

Information on finance comes mainly from finance institutions within the Rahad Scheme, specifically the Sudanese Agricultural Bank. Farmers are indirectly connected to these institutions through agro-pastoral organisations.

To strengthen connections between farmers and the Sudanese Agricultural Bank, the bank could establish branches or offices in the villages. Farmers' Committees can help disseminate information to farmers and can facilitate the work of these branches on the ground.

More connections between local people and the bank can be gained through establishing branches or offices of the bank in the villages. These offices will make bank services closer to local people, who can also be trained on projects the bank is financing and how to deal with financial issues. In this way individuals or families will be well-monitored or followed in finances.

The Saving and Social Development Bank actor thinks the community needs awareness on handling micro finance projects; awareness is acquired from society but his institution can bring the service (interview4, paragraph 88). The Extension Department in the Rahad Scheme can therefore be the facilitator by conducting training workshops for farmers on micro finance projects.

The Farmers' Union and Pastoral Union are related negatively to each other in regards to livestock keeping and farming activities. Each actor had its own ideas about the better function of farming and animal keeping in the area. Therefore, both actors communicate poorly on these issues. To facilitate communication between both actors, there is a need to create connections between them. This connection can start from the village level and the Rahad Scheme level. The extension department in the Rahad Scheme can work to create the linkages between both actors at the Rahad Scheme level, while farmers' committees can weave connections between the Farmers' Union and Pastoral Union at village level.

The researcher thinks that the roles of the Farmers' Union in the Rahad Scheme reflect a strongly organised union in the scheme. What is missing is the union's need to extend linkages to the other relevant actors, especially women's groups, youth, and the Pastoral Union. Extension within the Rahad Scheme can work as a facilitator in this linking.

Farmers' committees have strong connections with some actors in the Rahad Scheme. Strong connections can increase access to more information within the network. Creating a relationship between the Pastoral Union and the farmers' committees can lead to access to more information and better possibilities for animal keepers within the Rahad Scheme.

Although there are negative comments given by farmers on the role of farmers' committees, they are still important actors in exchanging information on farming within the scheme. However, in order to share information on farming with more actors, farmers' committees need to extend their connections to other actors in the scheme, especially Pastoral Union members. In this way the innovation of the Rahad scheme can perform with better information circulation and thus better ideas and better problem solving.

If the Pastoral Union is to get involved in decision making regarding farming in the scheme, it needs to be considered as an equal and parallel farmer organisation. In this regard, connections need to be created between the Pastoral Union and Farmers' Union, and between farmers' committees and the Pastoral Union. Therefore, weaving connections between the Pastoral Union and Farmers' Union is suggested by the researcher as a part of many connections needed for better performance of agricultural innovations in the Rahad Scheme. The Extension department and farmers' committees can weave this connection (see Figure 2).

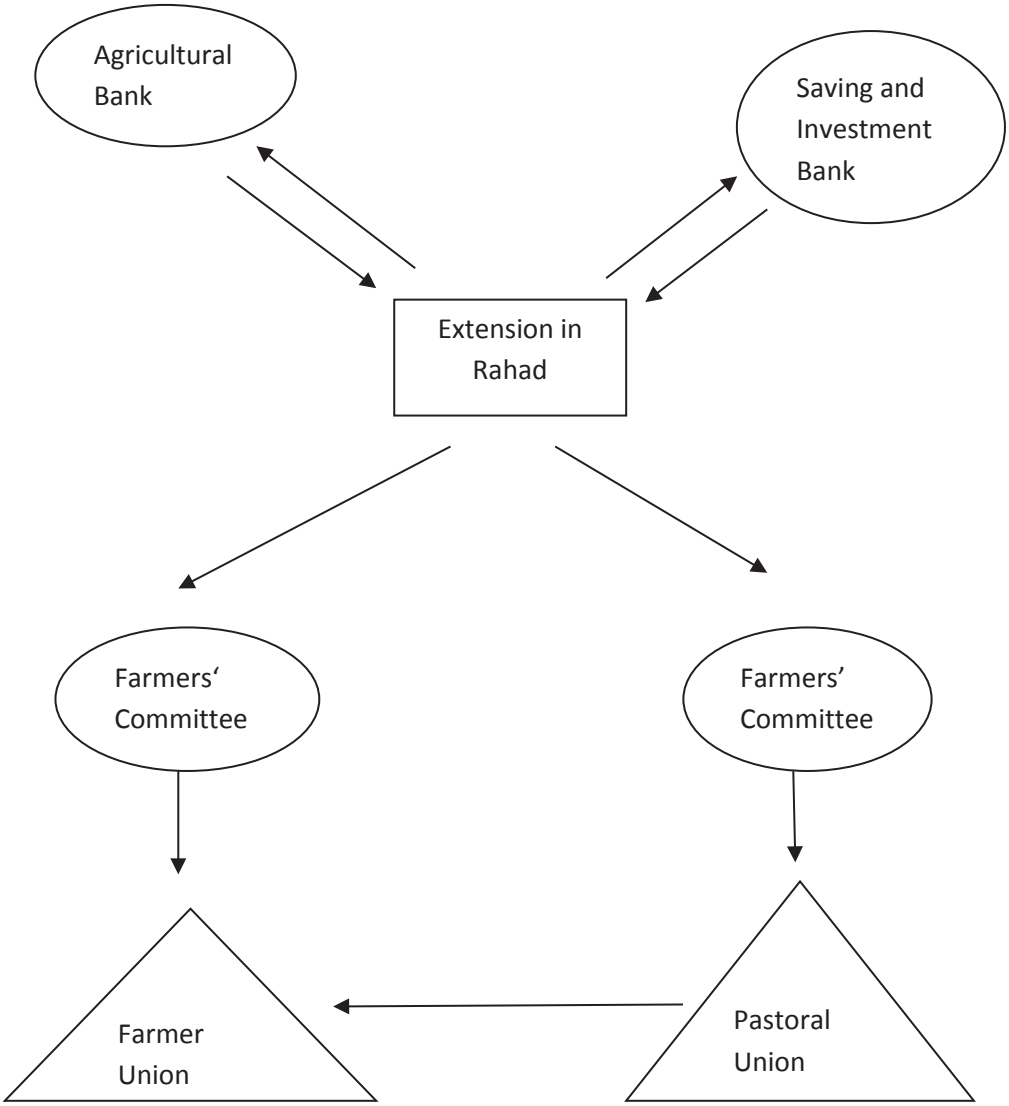

Figure 2. Connections built between agro-pastoral organisations and finance institutions through relations conducted by extension officers in the Rahad Scheme.

Farmers committees in this figure play the major role in connecting Farmers‘ Union and Pastoral Union to each other and to extension and then to finance institutions in the Rahad Scheme. In the same manner extension is connecting finance institutions to agro-pastoral organisations through farmers‘ committees.

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Workshop 5.2: Farm succession, inheritance and retirement: challenges for agricultural futures

Convenors: Brian Leonard, Marie Mahon, Maura Farrell, Cathal O'Donoghue and Anne Kinsella

The process of farm succession and inheritance is highly complex and involves a variety of actors, ranging from family members to professionals providing advice on legal and financial matters (Williams, 2006). In most European countries the family farm model is the predominant form of ownership, meaning that farm transfer commonly takes place generationally, with much of the literature highlighting that inheritance is the dominant means of entering farming (Hennessy & Rehman, 2007; Taylor et al., 1998; Kelly, 1982). Factors affecting the decision to transfer a family farm are highly complex, ranging across social, cultural and economic concerns. Some farmers aim to ensure all family members are catered for when the farm is transferred, signifying the power of emotional and symbolic factors in this decision-making process. Policy effects and economic concerns of capital taxes and future income can also have a very strong influence on farmer choices. Advisory services face particularly serious challenges as the farming community continues to rely heavily on their direction and guidance about succession and inheritance decisions; however, the relatively limited research on this issue means that advisors often feel ill-equipped to deal with the issue. In many developed countries there is concern over an ageing farming population. Almost one third of farm holders in Europe are over the age of 65 (Zagata & Sutherland, 2015). This is a source of major concern for the agricultural industry, as research has found a positive correlation between young farmers and farm efficiency/innovation (Potter & Lobley, 1992; Howley et al., 2012). A stifled land market in some countries has resulted in very low land mobility and capital accumulation amongst older farmers unwilling to transfer their farm assets, while state assistance in agriculture provides direct payments to farmers making it financially beneficial to retain agricultural land. The agglomeration of these issues has created a sector dominated by older farmers, where young farmer entry is rendered problematic. The future of agriculture and those who wish to enter the sector is jeopardised by these challenges.

Certain commentators have pointed to young trained farmers as having a positive impact on farms in terms of issues like technical efficiency, increasing output, decreasing environmental impact and being more aware of market requirements (Lobley, 2010; Howley et al., 2012). Based on the current literature, in a market that requires production in an efficient manner, the suggestion is that the most productive and efficient farmers, i.e. young farmers, should be working in the sector (Williams, 2006; Zagata & Sutherland, 2015).

The process of agricultural policy-making has been widely criticised by academics, particularly in relation to the Common Agricultural Policy (CAP). If policies are not reflective of the issues at ground level then they will not be successful (Pieckzka & Escobar, 2012). Brouwer (2004) further suggests that a requirement of effective policy is an appropriate incentive for the party affected by the policy. Vanclay (2004) also points to the heterogeneous nature of the farming community as a considerable challenge for policy-making. Extending these ideas to the area of farm succession and inheritance, and based on the limited success of previous policies and schemes targeting successors and retiring farmers, questions about the policy process can be raised in terms of the degree to which the complexity of succession/inheritance has been understood and taken into account (Hennessy, 2014).

The potential of farm partnerships to facilitate farm succession and inheritance

Leonard, B.[1,2], Mahon, M.[2], Kinsella, A.[1], Farrell, M.[2], O'Donoghue, C.[1], Hennessy, T.[1] and Curran, T.[1]

[1]*Teagasc Rural Economy and Development Programme*

[2] *School of Geography, NUI Galway*

Abstract: The prominence of collaborative farming arrangements in countries such as New Zealand, Norway and the Netherlands has been investigated with varying reasons as to why farm structures of a collaborative nature have been undertaken. The motivations for this contain a mix of economic and social facets. At present, the rising average age of farmers and low level of young farmer entry is being theorised as problematic on a global scale with Ireland being no different. Here, farm partnerships are presented as a possible means by which farm succession and inheritance could take place in a timely manner. This research aims to investigate a recent proposal by government to introduce a tax relief as an incentive for farmers to part take in farm partnerships. A hypothetical microsimulation model is used to investigate the possible outcomes of such a tax relief, with scenarios created to examine how this would materialise. It draws on the Teagasc National Farm Survey data which provides Irish data to the Farm Accountancy Data Network in the European Commission. The Net Present Value (NPV) of income streams for farmers and their successors are calculated to assess which scenarios have the highest/lowest financial effects. The findings illustrate that even with a tax relief cattle rearing farms would struggle to reap any economic benefit from entering a farm partnership, while their dairy counterparts would receive more value from tax reliefs. Results also indicate that farm viability will play a large role in whether or not collaborative farming is viewed as an option for farmers.

Key Words: Farm partnership, succession, inheritance, collaborative farming

Introduction

Contemporary agriculture faces a myriad of challenges ranging from increasing pressure to reduce environmental impacts to the threatened financial viability of some farms. No concern however is more pertinent at farm level than that of business continuity, of which succession and inheritance planning is an integral part. Farmer decision-making around succession and inheritance is complex and multifaceted while influencing factors are economic, personal and social; with every farm succession and inheritance route being idiosyncratic. Due to the complexity of the situation, policy makers are challenged in their endeavour to encourage transfer of farm ownership or management to a younger generation. The increasing average age of farmers globally has been problematised as a situation of lower production, efficiency and technology adoption correlated with older land-holders (Potter & Lobley, 1996; Lobley et al., 2010; Howley et al., 2012). This perceived problem of reduced productivity and efficiencies as a function of an ageing farm population is under particular scrutiny within Europe, North

America and Australasia where the competitiveness of the agricultural sector is high on national economic development agendas.

With a view to addressing the ageing profile of farming, a range of strategies and policy interventions have been put in place over the last three decades or so, from early retirement schemes to various tax incentives in an effort to encourage a more structured and predictable rate of entry into and exit from farming as an occupation. Farming is also construed as a 'way of life' as much as an occupation, and it is contended that emotional and other cultural and symbolic associations with agriculture have confounded attempts to introduce policy in a format that can take account of these complexities (Conway et al., 2016; Inwood & Sharp, 2012; Gasson & Errington, 1993). The issue remains however, that policy has not been sufficiently innovative to alter the established dynamic of low rates of transfer and an ageing farming population. The issue is particularly acute in the Irish context, where the vast majority of farm transfers are made via inheritance, and generally take place within families. This has culminated in a particularly stifled land market and very limited pathways to entry for young farmers (Hennessy & Rehman, 2007; Matthews, 2014).

One strategy for change currently being developed in the Irish policy context is the introduction and promotion of farm partnerships across all farming systems. Prior to 2015, registered farm partnerships in Ireland were only open to situations that involved at least one dairy farmer. The rationale behind farm partnerships as envisaged with the succession issue is that they incentivise a new set of working arrangements between older and younger farmers, as a way of providing more options for younger farmers to enter farming. They also create more opportunities to maximise efficiencies and profitability through combining expertise, experience and resources and through convincing older farmers of the benefits of earlier farm transfer. The benefits associated with young farmers being involved in an enterprise from the point of view of encouraging farm transfer have been widely cited. Potter and Lobley (1996) have coined the terms 'succession, successor and retirement effects' to describe the processes whereby an identified successor or lack thereof can significantly influence the original holder's level of interest and investment in the farm when approaching what should be their own exit from farming. Potter and Lobley (ibid) argue that "*farmers without successors…seem significantly more likely to be disengaging from agriculture"* (p. 329). The successor effect thereby refers to the positive impact which a successor can have on a farm once he or she becomes actively involved in the running of a farm and decision-making processes. The retirement effect generally has a negative impact on farms, i.e. the process of semi-retirement tends to be characterised by de-intensification and liquidation of assets if there is no successor present. The contention is that a farm partnership could promote the successor and succession effect together with creating an environment for shared decision making and control, while stifling the negative outcomes of the retirement effect (ibid).

A key aim of this research is therefore to provide a critique of the current and previous mechanisms relating to farm succession and inheritance, assessing the plausibility of farm partnerships as a means by which farm succession and inheritance can be facilitated. The issue of financial viability of a farm partnership is a second crucial aspect; if the partnership cannot sustain the farm and provide a reasonable income for those involved, it is unlikely to be embarked upon regardless of its capacity to encourage farm succession to take place. The paper is structured to initially provide a comparative analysis of farm partnerships internationally (including Ireland) as a mechanism to support succession and inheritance, focusing on structural and policy aspects. Secondly, taking the example of Ireland, it examines

the financial implications for farmers of embarking on farm partnerships with a view to farm succession. It does this by applying a hypothetical microsimulation model to assess the value of a range of tax reliefs offered as incentives to enter partnership arrangements, and to proceed on to farm transfer. In addition to this, previous issues regarding farm partnerships and their interaction with schemes will be highlighted. Notably this paper is part of a larger body of work to be published investigating farm succession and inheritance.

Collaborative farming models to support succession and inheritance

Farm partnerships are one of the farming arrangements that come under the umbrella term 'collaborative farming'. Other arrangements considered collaborative farming include contract rearing, share farming, cow leasing and long term land leasing (Curran, 2015). Forms of collaborative farming, particularly farm partnerships, have been identified as a step towards farm succession and inheritance. Commins and Kelleher (1973) (and later Gasson and Errington, 1993) refer to the succession process as a 'ladder' of responsibility which is gradually ascended by a young farmer entering a business. Generally the process of retirement and succession is a gradual one that follows clear phases, hence the ladder analogy. The first phase is where the farmer shares the workload with the successor. Following this, management is slowly passed over to the successor before eventually the successor becomes the sole operator. The identified middle phase is likened by Gasson and Errington (1993) to a farm partnership. A farm partnership involves the pooling of resources and skills of the parties involved; a contract is agreed which specifies profit shares for the parties involved and sets out levels of input each partner will have. Macken-Walsh and Roche (2012) describe a farm partnership as a situation in which "*two or more farmers join resources and efforts in order to acquire various benefits"* (p.2). Partnerships have developed in a variety of ways in different countries, with diverse levels of uptake.

Partnerships have developed in a variety of ways in different countries, with diverse levels of uptake. At present they are popular amongst farmers in New Zealand, France, Norway and the Netherlands (Johnson et al., 2009; McLeod, 2012). Partnerships in Ireland are most similar in structure to those in France, known as GAECs (Groupements Agricoles d'Exploitation en Commun). The GAECs facilitate the bringing together of small scale farms with the objective of making farming more viable. Policy changes in French agriculture have accommodated the GAECs in order to encourage farmers to enter or remain in an arrangement.

Opportunities of the farm partnership model

Partnerships facilitating succession and inheritance

The transfer of decision making responsibilities can be a bone of contention for farm successors with older farmers retaining control over decisions until they exit farming. A farm partnership provides an avenue for responsibilities to be more formally shared between farmer and successor, thus reducing the possibility of a successor becoming frustrated over time (Errington, 1998). In the UK, Ingram and Kirwan (2011) evaluated the Fresh Start Initiative, a scheme which matched new entrant farmers with retiring farmers as a means of giving younger farmers a start and older farmers a gradual exit strategy. However, this was not seen as hugely successful because there were insufficient profits from some partnerships to sustain two salaries; additionally farmers were reluctant to enter a partnership with someone who was not previously known to them. In contrast, Gasson and Errington (1993) describe the partnership model as an excellent means by which a successor can gain managerial responsibility prior to fully taking over a family farm. In addition they assert that farms where a

farmer-son partnership is in place tend to expand far more than their counterparts. Ingram and Kirwan (2011) also note that farmers are more willing to cooperate with family members. Many Dutch farms are in partnerships which facilitate the process of gradual succession (NRN, 2012). In New Zealand farming in partnership is popular amongst dairy farmers, with McLeod (2012) referring to forms of farm partnership as 'succession options'. In the Dutch case a 'maatschap' allows a successor to build up a share in the farm business over time and also facilitates the gradual transfer of control from the farmer to their successor (Gasson & Errington, 1993). This form of partnership is utilised by the majority of farms in the Netherlands (Johnson et al., 2009). Van der Veen et al. (2002) note that a maatschap can be attractive to a young farmer as it provides them with the security of knowing that they will eventually take over the farm, thus avoiding the ambiguity that can arise in cases where farm transfer is not discussed. Additionally, the farmer and his/her successor are placed as equal partners as opposed to the farmer being the main decision maker. Until recently, registered partnerships in Ireland were only an option where at least one partner was operating a dairy system; however partnerships were introduced for all farming systems as of spring 2015. In the case of New Zealand, the dairy industry has a well-developed career structure which gives young farmers the opportunity to begin farming and has exit schemes available for older farmers such as phased exit strategies (CIAS, 1996). Up to 40% of New Zealand's dairy farms operate under share milking agreements, indicating a high success rate, while over 20% of all dairy farms in Norway are managed using some form of partnership (McLeod, 2012). Ingram and Kirwan (2011) discuss 'joint venture' (JV) farming which includes farm partnerships. They describe JVs as "*a flexible alternative to conventional tenure arrangements"* (p. 919). However, McLeod (2012) notes that sheep and beef farms tend to use 'more traditional' forms of succession and inheritance.

Risk reduction

A critical issue in partnership arrangements is how decision-making and risk assessment are shared. Collaboration among farmers can lead to management synergy especially if it is collaboration between farmers coming from two different enterprise backgrounds, for example, beef and dairy. If farmers differ in managerial ability, those with relatively low ability will benefit from the experience of working with those with relatively high managerial ability, while those with high managerial ability will gain access to additional resources. It has been argued that farmers are generally risk averse (Groom et al., 2008), so partnership arrangements may promote risk reduction in net income by risk sharing and diversification effects; thus partnership arrangements should be an attractive option for farmers. Moreover, the risks associated with introducing new technologies can be shared among farmers (Larsen, 2008). McLeod (2012) cites the perceived risk involved in joining a farm partnership as a contributing factor to a final decision, going on to reference sharing of risks as a potential benefit to being in a farm partnership. For retiring farmers, a partnership may be perceived as attractive as it allows them to retain some control over the farm, particularly if they do not have a source of retirement income. Entering a farm partnership does not require the farmer to transfer any land to a successor, possibly reducing the perception that they are losing control of their farm which often deters farmers from engaging in succession/inheritance (Lobley et al., 2010). From the perspective of a successor, the formation of a partnership can confirm their status on the farm. In many cases successors may be unaware if they will definitely inherit the farm or not, and often do not receive payment for the work they undertake (Gasson & Errington, 1993). The partnership contract in the Irish case incorporates the sharing of profits, which in

turn reduces the risk of a successor abandoning the family farm as a result of becoming frustrated with a lack of pay or responsibility and seeking opportunities outside of farming.

Methodology and Data

In 2002, registered Milk Production Partnerships (MPP) were made available to dairy farmers in Ireland based on the GAEC system. Initially partnership agreements were confined to bringing together two producers who each had a holding and a milk quota; however, in 2003, new regulations were introduced which aimed to expand the use of partnership arrangements. One of the features of this change was to provide for partnership arrangements between a parent and son/daughter and in conjunction with this, under the restructuring scheme, to allow priority access to quota to the son/daughter as a new entrant to dairying. Although initial interest in partnerships was low there has been significant uptake in recent years, particularly in the new entrant/parent arrangements. In 2016, partnerships were made available for all farm systems to enter and current figures indicate that there are 1,145 registered partnerships in Ireland (DAFM, 2016).

This section focuses on an analysis of the different tax reliefs/schemes available to farmers in partnerships in terms of how they potentially impact on succession and inheritance decision-making. It does this through the use of microsimulation modelling to produce a comparative analysis of 2 (hypothetical) base farms involved in farm partnerships, with one farm in the pre-2016 and the other in the post-2016 (proposed) partnership scheme, in terms of how each fares in terms of financial viability. In addition to this, farms in pre-2016 scenarios will not receive assistance from the 'Support for Collaborative Farming Grant Scheme' (SCFG - discussed below). Details of the different tax reliefs under each scheme are first outlined, followed by a description of the hypothetical simulation model applied.

Financial incentives/tax reliefs

In December 2015, the Irish government announced an income tax credit (subject to EU approval) to encourage the transfer of farms within families. A new register will be created for farm partnerships in which one partner is a young trained farmer. This register will allow an annual €5,000 income tax credit to be split between the partners in a farm partnership for a five year period. One of the conditions is that 80% of farm assets must be transferred within 3 to 10 years of applying to register a partnership to avail of the tax credit.

Changes introduced as part of the introduction of the most recent CAP reform have embraced the concept of multiple payment thresholds to registered farm partnerships across all CAP Pillar I and Pillar II schemes. The concept that "farmers entering into a registered farm partnership should not be in any way disadvantaged when compared to farmers operating in their own right" has been embraced by policy holders. Technical issues can still arise that cause problems for farmers obtaining their multiple payments.

A SCFG has also been introduced to cover 50% of the costs incurred in entering a farm partnership. This grant aims to cover some of the legal, financial and advisory fees associated with setting up a collaborative farming arrangement. The maximum payment is €2,500. Those in a Department of Agriculture, Food and the Marine (DAFM) registered farm partnership can also avail of stock relief in two ways; with young farmers receiving 100% stock relief for the first four years after setting up as a farmer and their partners able to avail of an enhanced stock relief at a rate of 50% on their share of the increase in stock value. Farmers can also benefit from a higher investment ceiling for the Targeted Agricultural Modernisation Scheme

(TAMS) and multiple payments under the Green, Low Carbon, Agri-Environmental Scheme (GLAS), Areas of Natural Constraint (ANC) payments and the Organic scheme.

Hypothetical microsimulation modelling

The area of farm succession and inheritance lends itself to a high level of complexity given the factors involved such as the wide-ranging impact of such a decision on the lives of the farmer, successor and their families (Inwood & Sharp, 2012). For this research, the chosen scenario used to analyse the economic impact of different routes to succession and inheritance is that of entering a farm partnership. Hypothetical microsimulation is the most appropriate methodological approach as it allows for complexity to be removed to an extent and an assessment of different changes to be made at a micro level (O'Donoghue, 2014). This method facilitates the projection of income streams for both parties, whilst allowing for farm level changes (such as income increase/decrease and farm size adjustment) to be made for each scenario.

Microsimulation models use data on micro-units (e.g. households, firms, farms, etc.) to simulate the effect of policy or other socio-economic changes on the population of micro-units (Mitton et al., 2000). The need for microsimulation arises from the difficulty of observing simultaneously the outcomes for the same micro-unit under a treatment and in the absence of a treatment (e.g. policy change), and also crucially as a tool to understand the complexity of a policy problem. The result of the microsimulation models can be affected by many factors, which makes it difficult to illustrate the effect of a single factor. Hypothetical models focus on a particular scenario under certain predefined assumptions. This allows the model developer to examine a simplified version of the simulated observation (O'Donoghue et al., 2014). Microsimulation techniques have become a much used instrument for their ability to provide an assessment of differing scenarios and facilitate decision making (Spadaro, 2007). In this case, microsimulation will be used to understand economic decisions regarding farm partnership and conclusions will be drawn around the likely follow on implications for farm transfer. Focusing on a hypothetical farm allows for the sensitivity of farms to policies to be tested while avoiding the complications that would arise were this study to be undertaken on a real farm. Farm level decisions are not always rational or economically driven (Vanclay, 2004; Howley et al., 2012), but this method facilitates the simulation of decisions based on economic incentive as opposed to basing decisions on non-economic phenomena.

Farm viability

While farm viability[1] is not the only factor taken into account when making succession and inheritance decisions, a non-viable farm is less likely to be capable of supporting two generations at once as part of a farm partnership. In the Irish case, Hennessy and Moran (2015) note that more dairy and tillage farms tend to be considered viable with cattle and sheep farms being more likely to be sustainable or vulnerable (Figure 1).

[1] Viable here denotes a farm that has the capacity to pay family labour at the average agricultural wage and provide a 5% return on all non-land assets.

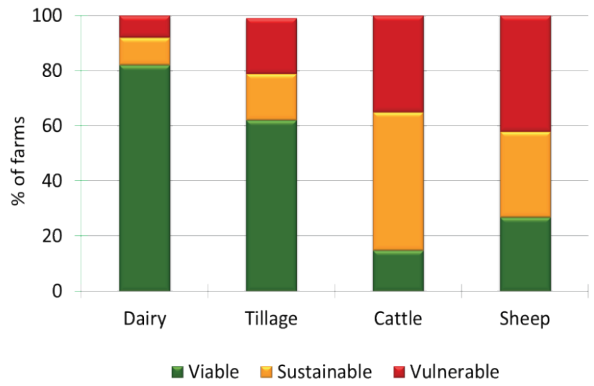

Figure 1. Ireland - farm viability by system 2014 *(Source: Hennessy & Moran, 2015)*

Data

Farmer and successor characteristics used are outlined in Table 1. These characteristics are applied so that the farmer and successor qualify for maximum capital tax reliefs. A farmer aged 35 or under is considered a young farmer for capital and farm partnership tax reliefs, while a farmer over 65 is considered to be at retirement age and is eligible for a contributory state pension at age 66 (depending on contributions made). The characteristics used here are as follows:

Table 1. Farmer/successor characteristics

Farmer	Successor
Age: 65	Age: 35
Married	Education: Level 6 Ag. Education
Pension: Contributory	Single
No off farm job	Off farm job (€25,000 income)

In addition to the above characteristics average figures from the Teagasc National Farm Survey (NFS) are used for modelling the effects of scheme changes and the formation of a farm partnership for cattle rearing and dairy systems (See Hennessy et al., 2013).

Format and expected outcomes

The scenarios for this research focus on hypothetical farm partnerships, figures for an average dairy farm are used, with scenarios modelled for pre and post changes to policy/schemes. It is expected that direct payments may make it more economically beneficial for the farmer to delay any transfer until death. These payments may result in land retention by older farmers, as they provide a steady source of income for retirement. Variables such as farm size, income, livestock units, etc. can be held constant which may not always be the case in reality. Adjusting aspects of the farms will test the effects of succession/inheritance (partnership) policies on income.

Results

In this section the outcomes of farm partnership scenarios are illustrated under different policy circumstances. In particular, an illustration is given of issues that have occurred while also investigating new and current schemes surrounding farm partnerships. While cattle rearing

and dairy systems were modelled, the focus here will be on dairy given the higher income levels and thus more notable results. The first part of this section describes issues that have arisen; the issues and current/proposed schemes are then modelled using hypothetical microsimulation.

Previous disincentives for farm partnerships

In recent years there have been policy changes to facilitate the promotion of collaborative farming and allow multiple payments to farmers farming in registered farm partnerships. Unlike the GAEC system in France, formal farm partnerships have not been a prominent feature in Irish agriculture over time; meaning policy makers have not facilitated collaborative forms of farming in some instances. In the case of Rural Environment Protection Scheme (REPS) payments, partnerships were not catered for in the earlier schemes. If a farmer in REPS entered a partnership with a non-REPS farmer (who did not qualify for the scheme) then both partners would be rendered ineligible. Here a REPS farmer would have to exit REPS and pay back penalties, resulting in a strong financial disincentive to enter a partnership. Changes introduced as part of the REPS IV scheme facilitated multiple payments to registered farm partnerships. Notably, the current agri-environmental scheme (Green Low Carbon Agri-Environment Scheme - GLAS) caters for farmers in partnership to be treated as separate individuals to avoid any loss of payment.

Additionally, both policy technical issues prevented farmers in farm partnerships obtaining multiple payments in the previous Disadvantaged Area Scheme (DAS). Under the scheme, a farmer operating in his own right would attract one payment on up to a maximum of 30 hectares. When two farmers who were drawing area based payments entered into an MPP they were then reduced to one payment threshold, likewise with three farmers. Only one payment was achievable under the scheme and consequently farmers entering registered partnerships were at a financial loss due to entering the partnership. Similar to agri-environmental payments, existing disadvantaged area payments (now 'Areas of Natural Constraint' - ANC) also cater for partnerships allowing multiple payment thresholds where two farmers are in partnership (i.e. maximum of 60 ha for a partnership with two partners). Table 2 illustrates the potential losses from area based payments not facilitating farm partnerships[2]

Table 2. Changes to area based payments for partnerships

Changes to area payments for partnerships		
	DAS (2013)	**ANC (2015)**
Annual payment for partnership (two farmers)	€2,468	€4,936
Annual losses from joining partnership	€2,468	None

During 2015, initial issues arose for ANC payments interacting with farm partnerships, caused mainly due to technical problems. At an administrative level, for farms to enter a partnership (where partners both have a herd prior number), typically one herd number would become 'dormant' on the Department of Agriculture, Food and the Marine (DAFM) registration system.

[2] *This example is based on a maximum of 30 ha for a 'Less Severely Handicapped' area (€82.27 per ha).*

In this instance only one herd number associated with a partnership could meet the qualifying criteria and therefore no payment was issued to the partnership. This issue has been resolved for 2016 by applying the qualifying criteria at partnership level rather than at individual partner level. The changes now allow for multiple payments to be issued from 2016 onwards. A similar technical issue arose in terms of the Basic Payment Scheme (BPS) entitlements; farmers joining a partnership would have entitlements merged making it very difficult to exit a partnership at the end of the agreed time period without financial loss. This has also now been resolved to ensure that when farmers dissolve their partnership, they can take back their entitlements in the same fashion as they first contributed them.

Example of potential benefits

Figure 2 presents an example of potential benefits for an average dairy farm in which a farmer and successor enter a partnership; the successor here brings 10 ha to the partnership which is being leased. The graph entitled 'Prior to Scheme Changes' does not include: higher ceiling of ANC payments, CFGS, or the proposed tax relief. 'Post Scheme Changes' includes these benefits. The partnership prior to scheme changes faces significant financial losses when compared to post changes. For ANC payment, the successor does not receive their payment on the 10 ha they bring to the partnership, resulting in a loss of €822 per year. Set up of partnership cost is €5,000 without the CFGS; here a loss of €2,500 is incurred. Finally, without the proposed partnership tax relief for the first five years, the partnership incurs €5,000 of income tax for five years that would not be charged under the proposed scheme. In addition to this, the TAMS grant and stock relief stipulations would apply were this partnership to increase herd size or make on farm improvements. The final graph illustrates what would occur if no partnership was entered into i.e. farmer retains all income until death.

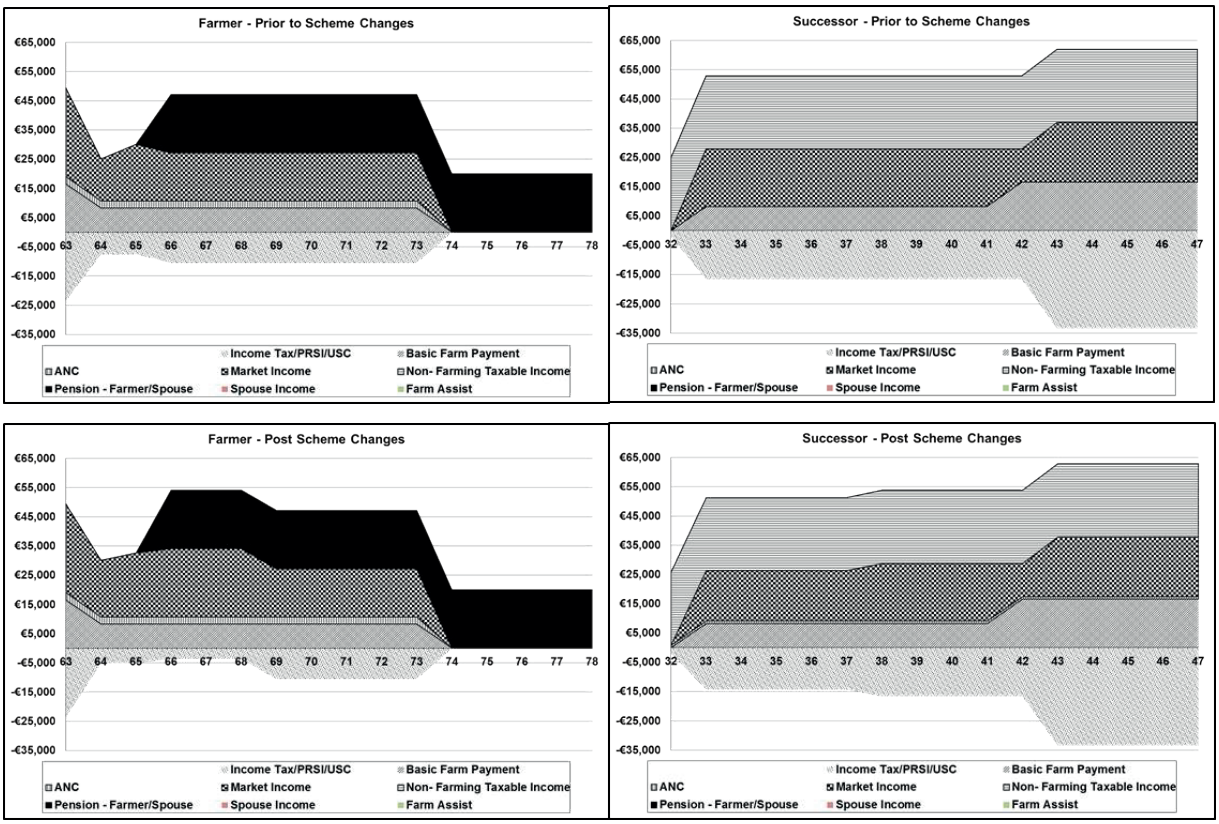

Figure 2. Illustration of potential benefits from scheme changes

Discussion and Conclusions

The results presented above illustrate the ways in which the farm partnership tax relief and SCFG would function, with varying outcomes. In general, the most notable concerns are the relative ability of a farm to generate enough income to support both a farmer and their successor, as well as the residual income of the farmer should they transfer the farm prior to death. In this regard there are clear differences emerging from the simulation exercise that appear to have a strong correlation in the first instance with the type of farm system involved (i.e. a beef system would have lower income compared to the dairy example used here). The proposed tax scheme accrues more financial benefit to the successor as they gain farm income from joining the partnership whilst also acquiring the tax relief. However, from the farmer's perspective there is a reduction in farm income and in the case of low income cattle rearing systems, tax relief provides little or no benefit. While the introduction of a farm partnership scheme is a positive step towards improved land mobility, successor centred policy does not adequately address the fact that there are two parties to be catered for in any farm succession and inheritance process. In terms of the SFFG, this provides minor incentive as it alleviates some costs associated with the setting up of a partnership.

It is established in the literature that the characteristics of a farm can have a strong influence on succession and inheritance outcomes, with factors that influence farm income (such as farm size and system) having the most impact on the processes. Uchiyama et al. (2008) found that farm size did influence succession, with successors on smaller farms being more likely to have employment and thus an income source outside of the farm, therefore decreasing the likelihood of them entering farming. Hennessy and Rehman (2007) also found this to be the case in the Irish context. Chang (2013) raises a similar issue when stating that young people have become less interested in farming as a result of the low income that is often accrued from agriculture. The implication is that smaller farms with associated lower incomes will make attracting a successor a difficult task, meaning that the partnership option has very little role to play in the succession process. Larger farms with higher asset values are more likely to be able to identify a successor (Calus et al., 2008). In a study on farm restructuring conducted by Lobley and Potter (2004), which observed a low number of respondents planning to exit farming, the majority of those exiting were older farmers operating smaller farms. The overall implication is that farm size can affect the exit and entry rate, i.e. successors are more enticed to take on larger farms, while exiting farmers are more likely to be leaving smaller farms that are probably financially unviable. Calus et al. (2008) recommend using Total Farm Assets (TFA) as an indicator for farms that will have a successor. While the idea that farm size, value etc. have a positive effect on succession outcomes, using TFA alone as an indicator would not suffice, as it does not capture important factors e.g. the number of children a farmer has. This is similar to the research findings here as they are limited to the micro simulation model outputs.

As discussed earlier farm partnerships in New Zealand, Norway, France and the Netherlands are a well-established model of farm management. With an average farm size of 252 ha (Beef and Lamb New Zealand, 2015) and the prominence of dairy systems, it is no surprise that partnerships are common in the case of New Zealand. Such farms are more capable of supporting two generations at once, meaning that partnerships do not pose any threat from an economic stand point. An exception would seem to be Norway, where the average farm is 20 ha (Eurostat, 2013), yet 20% of its dairy farms are involved in farm partnerships.

The findings from this research would indicate that there is a rational economic path to be followed towards farm partnership for larger and more financially viable farms, which in turn may facilitate quicker hand-over of farms from an older generation to a younger one. The rationale for undertaking farm partnerships to encourage the exit of older farmers is not apparent, and the merits of the tax relief scheme are otherwise not sufficiently appealing to promote extensive up take at the present time. While the SCFG eliminates half of the associated costs of set up, this may not be a sufficient incentive to enter a collaborative arrangement. The recommendations from this research would be for more wide-ranging enquiry into the ways in which the tax relief scheme could generate broader appeal, along with a series of recommendations on how this would be implemented. As it stands, its impact on the major policy concerns of an ageing farm population and associated implications for farm efficiency and agricultural productivity will be minimal. In the case of cattle farms, there is potentially an argument to be made for creating a scheme that provides an economic incentive beyond tax relief for farms of this nature; this would in turn have financial implications that would require more extensive research. Additionally, the consultation of individuals who fully understand the practical and administrative aspects of introducing new schemes is advised at the early planning stages of scheme rules and details. This could be realised in the

form of small stakeholder groups participating in the design of such policy initiatives to ensure that issues of collaborative farming interacting with future policy change are minimised.

In addition to the influence of farm size already discussed, this can also affect the risk preferences of farmers when considering structural changes such as entering a farm partnership. Crowley (2006) asserts that smaller farms will engage in new practices but 'only if there is a high level of confidence that it will not threaten their subsistence' (p. 55), going on to note the higher risk threshold larger farms can afford as a result of their stronger financial situation. Our findings support this argument, farmers on average cattle farms have their subsistence threatened due to the splitting of an already meagre income. In this situation it is assumed that the farmer may perceive a partnership arrangement as a risk to retirement income, particularly where they do not have any source of off-farm income. As mentioned earlier, a collaborative farming arrangement may reduce the risk of a successor abandoning the family farm. Thus it is appropriate to conceptualise the partnership model as a farm survival strategy akin to forms of farm diversification.

While farm partnerships may not be financially attractive to cattle rearing farms (as a result of the inability of a low income system to provide financially for two generations at once), the need to gradually exit and allow the entry of a successor into the farm business may be met by such an arrangement. In tandem with this, Ingram and Kirwan (2011) suggest that farm partnerships may provide a suitable means by which older farmers can gradually exit farming. In a partnership farmers may retain levels of control while their successor can also have an influence over decision making. The nature of a farm partnership contract facilitates the staged exit of an older farmer and entry of a young farmer and in this manner a successor may ascend the 'succession ladder'. However, while there are benefits of a non-financial nature associated with farm partnerships, beef and sheep systems continue to take a traditional approach to farm succession and inheritance (McLeod, 2012). This indicates that farmers in systems where finances are not as robust may fail to see positive aspects of partnerships. Gasson and Errington (1993) for example describe "*limited farm size with its associated shortage of adequate income and accommodation to support the two generations"* (p. 208) as constraints for the formation of farm partnerships. While this may be the case, partnerships for farm systems where off-farm work is the norm may be undertaken for reasons such as those listed earlier (see Table 2). Applying this to the findings here, it can be determined that cattle rearing farms need to be made more aware of the non-pecuniary benefits of partnerships.

The main findings from this research indicate that farm partnerships are to some extent a suitable means by which to expedite farm succession and inheritance; however, this statement comes with some caveats. The suitability of a partnership depends on the individual farm level situation and also what expectations the farmer/successor has for the partnership model. Based on the findings from this research, deciding to enter a partnership based on a solely economic rationale is best suited to dairy systems, while cattle rearing farms may have a propensity to focus on benefits such as the gradual transfer of control and increased leisure time afforded to partners. These wider non-economic benefits that could potentially be generated through farm partnerships, which could in turn bring a shift in mind-set about the value of earlier farm transfer, require further research and wider dissemination of information on same. This is especially important in the case of farmers' operating systems where budgetary constraints are present.

In summary, facilitating a sector-wide increase in farm succession and inheritance will require a higher level of understanding of different farm systems and the way in which partnerships as part of this process can aid these farm businesses in the first instance, and facilitate early farm transfer in the second. Finally, as the farm partnership scheme is in its infancy an appraisal of the scheme is required to ensure it is effective in encouraging farm succession and inheritance.

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Willingness of youth to practise agriculture: implications for farm succession and sustainable farming systems In Nigeria

Akintayo, O.I. and Lawal, B.O

South-West Farming Systems Research and Extension Programme, Institute of Agricultural Research and Training, Nigeria.

Abstract: Nigeria is an agricultural nation having forty-one percent of her Gross Domestic Product (GDP) from agriculture which also employs about seventy percent of her workforce. Approximately thirty-three percent of the nation's land is used as arable land although about eighty percent of the land is potentially cultivable. The rural farming population is noted to be ageing while the youth are migrating from rural areas to engage in activities other than agriculture. This study examines the factors which influence the willingness of youth in tertiary agricultural institutions to practise agriculture after graduation. A sample of final year agricultural students in four tertiary institutions in south west Nigeria was used for the study. Data and information were obtained through structured questionnaire and secondary sources. Results indicate only forty-nine percent of the students had aspirations towards the practice of agriculture as a profession after graduation while fifty-one percent had aspirations for other things apart from agriculture. Reasons given for the lack of interest in agriculture after graduation include the labour-intensive nature of farming in the country, perceived low profitability of agricultural enterprises and lack of easily accessible funds for agricultural activities. Recommendations made by the students include increased government participation in the agricultural industry with particular reference to funding of agricultural institutions (research and banking institutions) and provision of good social infrastructure in rural areas. With these recommendations appropriately addressed, the students are hopeful that more youth will take agriculture as a profession and thus take over from the ageing farmers.

Key words: Youth, farming systems, agriculture, farm inheritance, farm succession.

Introduction

Nigeria is a tropical country which lies between latitudes 4^0 and 14^0 north of the equator and longitudes 3^0 and 14^0 east of the Greenwich meridian. With an estimated population of 181 million people (CIA, 2015), the country has a rich natural agricultural resource endowment which includes about two hundred and thirty billion cubic metres of water and 84 million hectares of agricultural land. Agriculture contributes about forty-one per cent to the nation's GDP and employs about seventy per cent of the workforce. However, Nigeria's dependence on food imports has increased over the years, causing the country to expend over eleven billion dollars ($US) on food importation every year.

Farming in Nigeria is dominated by smallholder farmers who produce more than seventy per cent of total national agricultural output from the cultivation of about ninety per cent of total

cultivated arable land. These smallholder farmers cultivate relatively small farm plots which are usually less than five hectares using simple implements. Agriculture in Nigeria can generally be described as low input, rain-fed agriculture. Farming systems vary widely across the country from one agro-ecological zone to another. The prevalent farming system in a particular location largely depends on natural and socio-economic factors in the area. These factors include climate, soils, crops, livestock, pests, food preferences and population. In south-west Nigeria, however, intercropping is very prominent with cereal-tuber crop combination being the most practised farming system (Amujoyegbe, 2012).

Young people are noted for their energy, enthusiasm and creativity which have been recognised as being part of a nation's greatest assets (FAO et al., 2009; Kakwagh & Ikwuba, 2010; Vargas-Lundius, 2011). When these positive attributes are effectively promoted and utilised, youth will play a key role in improving agricultural productivity and sustaining farming systems. With the ageing farming population in Nigeria (Adeyemo et al., 2010; Akpan, 2010), it is important that a structural change in the labour composition of the farming sector be effected.

For this study, youth is taken to be people in the 15-35 years age bracket. This category of people makes up about forty-two per cent of the Nigerian population (NBS & FMYD, 2013). It has been noted that instead of taking a career in agricultural activities in the rural areas, rural youth migrate to urban areas to find alternative employment (FAO et al., 2009). In a study carried out in a southwestern Nigerian university by Adebo and Sekumade (2013), most of the sampled students in agricultural sciences, many of whom came from farming families and had their childhood homes in rural areas, perceived agriculture as laborious, of low self-esteem and a stepping stone to other professions. Evidence (Ayanda et al., 2012; Tijani, 2014) suggests many young people in Africa, including Nigeria, are choosing not to pursue livelihoods in agriculture, particularly as farmers. Decisions taken by these young people will obviously have implications for farm succession and sustainable farming systems.

Farm succession can be viewed as the process of how farms are passed on from one generation to the next. In most developed countries, the ideal type of farm family business ownership and management are handed down within the family (Stiglbauer & Weiss, 2000). This ensures sustainability of the farm family business. However, in southwest Nigeria where farm lands are mainly rural lands, most of the land is acquired through inheritance (Saka et al., 2005; Adeyemo et al., 2010). Traditionally, the farm land is not handed down to a particular successor, but is divided up into plots to be shared by direct descendants of the farm owner. This system of obtaining farm land is one of the reasons why many farm lands in south west Nigeria are fragmented and small.

Methodology

Using the multi-stage sampling technique, four tertiary institutions from which two hundred and forty students were sampled, were selected from southwest Nigeria. The sampled students were agriculture students in their final year of study. Data were obtained through the use of a structured questionnaire while analyses were by descriptive and inferential statistics.

Results

Mean age of the sampled students was 22.4 years. About forty-nine per cent (48.75%) of the students indicated willingness to practise agriculture after graduation while fifty-one per cent

(51.25%) indicated willingness to engage in other activities besides agriculture. Table 1 illustrates the opinion of the students on the present state of the agriculture sector in Nigeria.

Table 1. Students' opinion on present state of agriculture

Present state of agriculture	**% of students who agree**	**% of students who disagree**
Too traditional and laborious	90.83	9.17
Sustainable	1.67	98.33
Meets national food demand	0.00	100.00
Very lucrative	6.25	93.75
Attractive to young people	5.42	94.58

With a very youthful Nigerian population, it is necessary to harness this youthful human resource and all the natural resources to transform agriculture from its present state to a position where it is sustainable, meets national food demand, is very lucrative and attractive to youth.

Reasons given by the fifty-one per cent of the students who indicated unwillingness to practise agriculture after graduation include:

- Labour intensive nature of agriculture: more than sixty per cent of farm work is done by hand-labour which of course, leads to drudgery and fatigue.
- Unwillingness to live in rural areas: these students associate farming with being resident in rural areas where social infrastructure is inadequate or lacking. They prefer to live in urban centres where social amenities are available.
- Non glamorous profession: agriculture was considered as a profession of low esteem.
- Low returns on investment: quick returns on investment was considered as a high priority for any business venture to be considered attractive and profitable for these students.

With regards to the students who indicated willingness to practise agriculture after graduation, reasons given for their willingness include:

- Viable business opportunity: there is always a need for food and other agricultural products such that there is an opportunity for every agricultural venture to have a portion of the business market. Some products also have export potential.
- Self-employment: instead of being job seekers who are waiting to be hired, these young people can become job creators, employing themselves and others.
- Financial independence: instead of being dependent on family and friends for finance due to unemployment, these young people can, through the practice of agriculture, have a good and sustainable source of income to cater for themselves and others.
- Opportunity to contribute to national development: by using the knowledge and skills acquired from school, they will be able to practise agriculture in such a way that modern technology is utilised to sustain our farming systems.

Conclusion

Recommendations made by the students towards attracting youth to agriculture include increased government participation in the agricultural industry with particular reference to the funding of agricultural institutions (research and banking institutions). In addition, government is expected to provide social amenities and infrastructure in rural areas to make residence in these areas comfortable and agricultural investments attractive. With these recommendations appropriately addressed, the students are hopeful that more youth will take agriculture as a profession and thus take over from the ageing farmers.

From the results of this study, it is evident that there is a need for guidance of students and parents when it comes to the choice of a career path for the students. Counselling of students in schools by qualified personnel should therefore be an active process throughout a student's stay in school. Furthermore, rural development should be of a higher priority for the government. Modern infrastructure should be provided in rural areas such that all basic facilities available in cities are also available in rural areas. With these facilities in place, young graduates will find it more attractive to live in rural areas and engage in agricultural activities.

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Starting a process: practice and policy lessons from a farm succession planning intervention in the Australian dairy industry

Santhanam-Martin, M.

Rural Innovation Research Group, Faculty of Veterinary and Agricultural Sciences, University of Melbourne.

Abstract: Intergenerational succession on family farms typically unfolds through several stages over an extended period: it is a *process,* not an *event*. Amidst the continued concern in many countries that farm succession is not proceeding well, there are two salient questions that arise in relation to succession planning *as process*: (1) how can farm owners be assisted to *start* the process; and (2) what policy settings are needed to support succession planning *as a process*. This paper addresses these questions through discussion of a study of a succession planning intervention in the Australian dairy industry. The study involved in-depth interviews with participating farm families (N=10), and facilitated reflection with the two consultants who delivered the intervention. Nine of the ten families reported that the intervention had generated concrete steps in their intergenerational transition process. A key feature was that the delivery method was flexible enough to identify and work on one or more specific points of current "stuckness" within each individual family's situation. The nature of the "stuckness" differed greatly between farms and the consultants observed that they fully expect a number of the farms to become stuck again when a future point of difficulty is encountered. In the context of Australia's pluralist agricultural advisory system, these findings suggest that an important role for succession planning interventions is to build connections between farm families and the range of different advisory professionals whose assistance will be needed to deal with different points of "stuckness" as they arise.

Keywords: Family farming, succession planning, farm business transitions, retirement, dairy farming, Australia

Introduction

Australian farms and Australian agricultural policy both differ in important ways from their European counterparts. And yet the farm succession process – how people enter farming careers, how they leave them, and how farm businesses proceed through these various transitions – is currently a matter of concern for agricultural industries and policy-makers in both Australia and the EU (Victorian Government 2011; Lobley et al., 2012; Conway et al., 2016). Particular concerns include the on-going ageing of the farm population, the difficulties that young people face in entering farming and a concern that problems with the succession process are constraining innovation and industry renewal.

This concern that farm succession processes are not occurring as effectively as they should be leads to an interest in how agricultural policy, and how agricultural advisory practice, can assist. Succession planning has existed as an area of agricultural advisory practice for some decades, and there is a body of scholarly research that has documented successes and failures, and proposed theory and practice principles (Barclay et al., 2007; Goeller 2012;

Leach, 2012). Nevertheless, this is still noted as an area where little is known and therefore where further empirical research is warranted (Baker, 2012; Lobley & Baker, 2012; Sappey et al., 2012). There are two consistent findings from previous research that provide useful entry points for further investigation. Firstly there is the oft-repeated observation that intergenerational transition is indeed "*a process, not an event*" (Leach 2012 p. 200). Secondly there is the finding that there is often a specific resistance within family farms, as in family firms more generally, to *beginning* this process (Lansberg, 1988).

This paper uses the results of a study of a succession planning intervention delivered in 2015 to a small cohort of Australian dairy farming families to address two specific questions: (1) what type of advisory intervention is helpful in assisting families to get started with succession planning; and (2) what are the implications for agricultural policy if one takes seriously the finding that succession planning is indeed a process that takes place over an extended period? The intervention studied was called 'Getting Started', and is one initiative within a larger and longer-term regional-scale industry development project called the 'Alpine Valleys Dairy Pathways' project. This study is based on in-depth interviews carried out on ten farms, and on a debriefing interview conducted with the two consultant advisors who delivered the intervention. The following Section sets out the industry and policy context that gave rise to the Getting Started intervention, and describes the origins and design of the intervention itself. Subsequent Sections describe the research study upon which this paper is based, summarise key findings from the study, and apply these findings to discussion of the two research questions posed at the beginning of this paragraph.

Background

Succession, farm transitions and the Australian dairy industry

Dairying is Australia's third largest agricultural industry in terms of product value. Approximately 6,100 farms produce around 9.5 billion litres of milk annually, with a farm gate value of A$4.7 billion (€3.1 billion). Average herd size is 284 cows (Dairy Australia, 2016a). The Australian dairy industry continues to see potential for export growth, and hence both industry stakeholders and governments are interested in supporting the continuance and expansion of farm businesses (Horizon2020, 2013). For some eight years now the Australian dairy industry has had a particular interest in the future of the industry's farm workforce, inclusive of both farm owners and farm employees (Nettle et al., 2008; Nettle & Oliver, 2009; Santhanam-Martin & Nettle, 2014). Dairy farmers are younger on average than farmers in other agricultural sectors in Australia, but nevertheless the population of dairy farmers is ageing, and this is of concern to industry stakeholders (Dairy Australia, 2011). Stakeholders are concerned too that surveys typically show less than half of farm owners having documented farm succession or transition plans in place (Dairy Australia, 2011). In its advisory materials, the dairy industry uses the terminology of "Planning for the Future" to encompass its view that within-family succession is only one of many possible pathways into the future for farm businesses, and also to reference that there are many different component processes, affecting different individuals, that may need to happen in order for these pathways to be navigated. Recognising that the industry's future depends on farm businesses being able to navigate these pathways successfully, the dairy industry is actively exploring different modes of intervention that may assist (Dairy Australia, 2016b).

The policy and institutional context for intervention

Australia's agricultural policy context can be described as strongly neoliberal, and competitive-productivist (Dibden et al., 2009; Burton & Wilson, 2012; Lawrence & Campbell, 2014). Both policy *purpose* (what agricultural policy seeks to achieve) and policy *method* (how this purpose is enacted in institutions and their activities) are relevant context for this study. State and Federal governments in Australia continue to pursue agricultural production growth and export growth as their overriding policy goal, but seek to achieve this through the mechanisms of free trade, private sector leadership and market competition, rather than through state intervention (Dibden & Cocklin, 2010; Santhanam-Martin, 2015).

Therefore, it is dairy industry organisations, rather than government agencies, that are expected to, and indeed do, take responsibility for industry stewardship. Elsewhere I have characterised this form of industry governance as "industry in the lead" (Santhanam-Martin, 2015). There are three different groups of dairy industry organisations: (1) the milk processing companies that buy milk from farmers (the largest of which is a farmer-owner co-operative); (2) the industry advocacy organisations that represent the dairy industry in the public arena and in policy and regulatory processes; and (3) the industry "services organisation", Dairy Australia, which invests compulsory farmer levies and matching federal government grant funds in research, development and service delivery. It is Dairy Australia which is leading effort in the Australian dairy industry to understand and respond to issues around farm succession and farm business transitions. Dairy Australia, through its regional-scale service delivery partner Murray Dairy, provided funding for the Getting Started intervention, which was intended as a pilot study to generate learning on how to approach the task of supporting dairy farm families with succession planning. To capture this learning, Dairy Australia funded the research study upon which this paper is based.

The Alpine Valleys' Dairy Pathways Project & the Getting Started farm succession intervention

The Getting Started farm succession planning intervention took place in 2015 in the Alpine Valleys region of the Australian state of Victoria. This region is located in Australia's temperate-climate south-east corner (see Figure 1). It is bounded to the south by the peaks of the Victorian Alps, which reach above 1,600m elevation and receive winter snow, and to the north by the upper reaches of the Murray River, a tributary of Australia's largest river system. The region covers approximately two million hectares, of which approximately 600,000 hectares is used for agriculture. There are currently around 180 dairy farms in the region, all run as family businesses. Cows graze outdoors throughout the year on a mixture of irrigated and rain-fed pastures. Outside of two major urban centres, agriculture is the region's largest employment sector, but employs only 15% of the labour force. Dairying is the second largest agricultural industry (after beef and sheep grazing) in the region, both in terms of people employed and farm-gate value of production.

Figure 1. Location of the Alpine Valleys Region in the Australian state of Victoria

Since 2011, a consortium of community, government and dairy industry organisations has been conducting a collaborative industry development project in this region called the Alpine Valleys Dairy Pathways (AVDP) project. The overall aim of this project is to put the region's dairy industry on a growth trajectory, which the collaborating partners see as a desirable outcome for local communities, for government and for industry (Bridge, 2014). The project involves a range of activities across several domains including farmer education, workforce development and community development. Within the workforce development domain, farm business transitions, including farm succession planning, has been an area of particular interest. This is a response to an observation made by local dairy factory field officers in 2011 that up to a third of farms in the region could potentially cease dairying in the medium-term, with the absence of a family member wanting to take over the farm being the main risk factor in more than half of these cases.

In 2014 the AVDP project secured funding from Murray Dairy, the regional service delivery partner of industry services organisation Dairy Australia, to trial a new advisory intervention aimed at identifying and assisting farm families who wanted to take action on succession or transition planning, but who didn't know where to start. A private consultant was contracted to deliver the intervention. In February 2015 a simple survey was distributed by post and email to all 183 dairy farm businesses in the region. The survey was addressed to the current registered business owner, which in the vast majority of cases corresponds to the senior generation on the farm. The survey's eleven questions collected basic farm physical and demographic information and information on the current status of the farms' succession or transition planning. The final question asked "Would you like support with developing and/or reviewing your farm succession arrangements?" The survey elicited 86 responses (43%). Key findings from the survey included: only 24% of responding farms had a documented succession plan in place; 50% had discussed their plans with one or more professional advisors; 53% reported knowing what they would like to see happen in relation to succession or transition and 59% had discussed succession or transition with other family members. The project steering group interpreted these results as meaning that less than 30% of dairy farms in the region have an effective succession agreement in place, and set a goal of raising this to at least 50% over the next few years.

Fifteen out of 86 survey respondents answered "yes" to the final question, and were subsequently contacted by one of two consultant advisors. One of these fifteen later withdrew,

leaving a final cohort of fourteen participating farms. Participating farmers were not asked to contribute directly to the cost of the service, but most understood that they had in fact already made a small contribution indirectly, since the intervention was funded from industry R&D levy funds. If the cost of the Getting Started project had been recovered directly from the participating farms the cost per farm would have been about A$2,000.

The next step involved a semi-structured interview between the current farm owners (usually as a couple) and one of the project consultants. These interviews collected more detailed information about farm and family financial status, farm business performance, the make-up of the farm family and any other involved parties (e.g. long-term employees), current owners' vision for the future, succession planning activity already undertaken and relationships with professional advisors including accountants and legal practitioners. The interview also sought to identify a series of agreed next steps for the farm owners to take in order to progress toward their vision for the future. These steps could include the Getting Started consultant providing further information in response to particular questions that arose in the interview and could also include a request from the farm owners for the Getting Started consultant to interview other family members or involved parties. The project consultants compiled all the information from the initial interview with the farm owners, and from any subsequent interviews with other parties, into a document called a "Stage 1 Succession Planning Report". My research study commenced at this point: when the initial round of interviews with the project consultants had been completed and the resulting succession planning reports had been provided back to the farm owners.

Methods

The project consultants contacted all the participating farms to ask if they were willing to participate in a research exercise designed to capture learning from the intervention. Twelve of the fourteen participating families were willing to participate and in September and October 2015 I completed interviews on ten of these twelve farms[1]. Eight interviews were with the current farm owners (older generation) only. One was with the in-coming younger generation farmer only. On the tenth farm I spoke to one of the children as well as the current farm owners, in two separate interviews. At the conclusion of the farm interviews, I conducted a debriefing interview with the two project consultants. The key questions that I was asked to investigate by Dairy Australia were:

1. Does a short term intervention to set family businesses on the right track assist with more businesses reaching agreement on their farm transition arrangements?
2. What features of the intervention facilitated the successful engagement of farm families?[2]
3. What lessons emerge from the experiences of both the families participating in the trial intervention, and the consultants who delivered the intervention, to inform further development and implementation of similar interventions?

I designed a semi-structured interview schedule to elicit data in relation to these questions. The interviews with farm families lasted from thirty to sixty minutes, and the debriefing interview with the consultants lasted two hours. All the interviews were audio-recorded and

[1] On the remaining two farms it proved impossible to find a suitable time to carry out the interviews within the timeframe available for the research.

[2] By the time I was commission to undertake the research, relevant Dairy Australia staff had already formed the view that the Getting Started intervention had achieved a better than expected quality and quantity of engagement with farmers and was therefore worthy of further investigation.

subsequently transcribed, to facilitate thematic analysis. In this paper I have extended the analysis carried out for Dairy Australia to provide insight into the scholarly research questions posed in the first Section above:

1. What type of advisory intervention is helpful in assisting families to get started with succession planning?
2. What are the implications for agricultural policy if one takes seriously the finding that succession planning is indeed a process that takes place over an extended period?

Findings

In this section I present salient findings from thematic analysis of the farmer interviews and consultant debriefing. I have structured these findings as responses to a set of questions targeting the key matters of interest to the research sponsors.

Why did people choose to take part in this activity?

The most common answer to this question was that the service offering came at the right time:

> *"Our son had just said 'look, I think I want to come home', and [the survey] came around the next day, so I ticked the box!"* (Interview 7)

Farmers also noted that the initial survey was quick and simple to complete. Thus, the activity offered a low-risk and small-scale way to engage with a task that people understand to be important, yet large and difficult. One of the consultants described the nature of the Getting Started service as an opportunity to "put a toe in the water". Some people mentioned that they had known the consultant who worked with them on this project for a long time and that gave them additional confidence to opt in, and some people noted that it was a process originating from dairy industry organisations, rather than government or private businesses, and that gave them confidence, but these factors were not critical. More important was that it offered them help with an issue that was front of mind for them at that time. It was also very attractive that this was a service that would come to them, in their homes, and at a time that worked for them, and that it was a free service. Some people saw this service as a natural next step from the general information on succession planning that they had received at various information days and meetings over the years.

Has the activity been useful/helpful?

All the people I interviewed felt that the activity had been useful. Every farm faced different specific issues, and farms were at a variety of points on the farm transition journey from "done nothing" to "have been thinking and working on this for years", but everyone reported that this activity helped them to make progress. Everyone said it was a good use of their levy funds and that it should be continued or extended.

What was it about the process that was useful or helpful?

Points noted included:

- The sequence of questions in the interview was logical, and the questions themselves were good at stimulating new thinking;
- The interview stimulated talking and thinking about things that people knew they should be working on, but which had been placed in the "too hard basket";
- New aspects of the succession/transition process came up that hadn't occurred to the farm owners before;
- The interview identified options as to different succession and transition pathways;

- Very useful that the consultant was able to talk to the children independently of the owners;
- Very useful to get everyone's needs and priorities down on paper in a formal way, rather than having to rely on assumptions and general ideas.
- The final report was seen as a good document to support further activity, including family discussions and discussions with other professionals.

Were there things about the consultants that helped?

- It is helpful when the consultant is someone people have known for a long time – but for the majority of participants this was not a critical issue. The skills and approach of the consultant are more important.
- Consultant came and sat at the kitchen table. Spent time – not rushed.
- Consultant needs to know about the world of the dairy farmer.
- Consultant needs to understand the world of business.
- Consultant needs to provide unbiased advice in terms of looking after each of the interested parties in the family.

Were there any problems with the process?

For one farm out of ten, there was some frustration that the process couldn't take them further. They still feel stuck and unsure how to progress. This created frustration for the consultant too. This situation arose out of the way that this consultant interpreted the boundary around the service that they had been contracted to provide. This issue of setting an appropriate boundary around the service is discussed further below.

What has the intervention achieved for the participating farms?

For every farm but one the intervention has helped them to move along the farm transition journey. There are a set of next steps that they understand, support and are working on. The specifics are different for every farm. Examples of progress achieved (presented below as paraphrases of the interview data) are:

- I know more about the options for progressing toward retirement, and am seeking further information – but I will still need to make a final decision on how to proceed;
- There is a process underway now to get our son progressively more involved in the farm business;
- We now know more about our children's expectations and aspirations and can consider the options – and decide on next steps - with this knowledge in mind;
- Our transition process was already underway, but there were aspects that we hadn't thought through in enough detail. The chances of success have been improved by the extra level of detail reached through this process;
- Several farms reported that new connections had been established with other appropriate professionals, in order to progress the agreed next steps (farm management consultants, legal, financial);
- Several farms reported that the process had focused new attention on farm business performance including profitability, as business profitability emerged as a key enabling factor for succession to occur.

There were a small number of farms where the interview process highlighted a problem or issue that the farm owners had not really known about before, so there is a sense in which the project appears to have made things harder rather than simpler. However in these cases the issue was always present and would have emerged at some stage. These owners reported

that by bringing a somewhat hidden issue to their attention the Getting Started intervention has given them a better chance of finding a solution and minimising conflict.

Is this a service you would pay for?
Farm owners reported that they are happy in general to contribute to the cost of services they use. However, if this initiative had involved a direct cost to the farmer at the beginning, most would not have proceeded. If the cost was >A$1,500 then most likely nobody would have opted in. If it was A$500 - A$1000 there may still have been 5 or so participants. Having now been through the process people can see that it is of value, but nevertheless the fact that it was offered as a free service was definitely a key feature that encouraged participation.

The next three questions relate specifically to the reflections of the project consultants.

What is the appropriate boundary around what a "getting started" service should provide?
This is a complicated question that was discussed at length in the debriefing interview. The two consultants had in fact set the boundary quite differently. The first consultant described his approach as one of setting a "strict" boundary based on what he understood to be content of the service as set out in the project funding agreement. He saw his job as to (i) provide information to the client about what is involved in succession planning; and (ii) to document the current situation of the farm in the form of the Stage 1 Report. The Stage 1 interview report also identifies agreed next steps for the clients to take, but this consultant's interpretation of the boundary was that it was not his role to support the client in taking those further steps. He saw this activity as being of a much more limited scope than a "full" succession plan. He saw it as being an initial discussion that would identify the range of issues that would need to be addressed *if* the family decided to proceed to a full succession planning process. He reported that in a couple of cases setting this boundary left him feeling frustrated, because he knew that he had not done enough to get the farm transition process moving.

The second consultant's interpretation of the boundary of the "Getting Started" service was that his involvement should continue until one or more of the next steps were actually underway. In many cases the agreed next step was to start work with another advisor of some kind (e.g. an accountant, a lawyer, or a farm management consultant), and so this consultant saw his role as continuing up until that next relationship and piece of work had commenced.

There are further questions that arise based on how the boundary around this service is set:

- Is it responsible to get a family started on farm succession discussions if the support is not necessarily there to deal with issues and conflicts that may arise?
- If this activity has more flexible boundaries, and involves industry subsidy, will it be seen by other professional service providers as unfair competition? On this point, both consultants noted that to date the activity has in fact generated more work for other service providers, rather than taking work away.

Does the fact that this intervention was funded by the dairy industry introduce a conflict of interest for the consultants?
The consultants raised a concern that there is the potential for the interests of a particular farm family and the interests of the wider dairy industry to be divergent. For example industry

organisations might prefer to see a particular parcel of land remain available for milk production, whereas the life plans of the owners of that land might be best served by changing to an alternative land use. Both consultants felt strongly that they would only be willing to be involved in an activity like this on the basis that the interests of the farm family are paramount. However they also commented that:

- Many dairy farm families themselves have a strong personal commitment to the dairy industry, and hence are keen to consider options that allow them to remain involved with dairying in some way.
- Where industry funding is involved, it is appropriate that this be made explicit in promotional material. Potential participants who have an aversion to the dairy industry can then decide not to participate because of this connection.
- Having consultants involved in the activity who understand what options might be available within dairy means that these options are available for consideration, where they might not be if the consultant did not have this specialist knowledge. This does not constitute a conflict of interest.

There are some examples amongst the fourteen participating farms where a conflict of interest could have emerged. In each of these cases the interests of the family formed the basis of the agreed next steps, and in some cases the family themselves expressed a preference for options that retained a dairy link.

What is the appropriate measure of success for an intervention like this?

The consultants agreed that having a completed farm transition document or plan is not the appropriate measure of success for an intervention like this. A more appropriate measure would consider (a) whether a discussion about succession planning is underway within the family; and (b) whether working relationships have been established with one or more appropriate professional service providers, so that the discussions can progress.

Discussion and Conclusions

The first research question this paper posed was: what type of advisory intervention is helpful in assisting families to get started with succession planning? My investigation of the Getting Started intervention found that it offers one model of a helpful service. Nine out of the ten farms that I had contact with are actively progressing with transition activity on their farms and reported that the Getting Started intervention had contributed to this activity. Key lessons from this success that could inform further development and implementation of similar interventions include:

- The Getting Started intervention offered a small-scale and low-risk way for farming families to “put a toe in” to the frightening and murky waters of succession planning. This seems to have helped lessen the well-documented resistance to starting succession planning discussions (Lansberg, 1988).
- The selection of consultants to deliver the service is critical to its success. Attributes that participating farmers valued in the consultants included their breadth and depth of knowledge of farming and business practices in the particular agricultural industry concerned and their attention to the needs and interests of all interested parties.
- More generally it was the relational quality of the intervention that assisted its success. The consultants were individuals with some standing in the dairy industry and the region, who came to work with families in their homes. This contributed to creating a safe relational space in which difficult issues could be teased out in conversation.

- A service like this needs to be offered to a target population of farmers repeatedly at regular (e.g. annual) intervals, to capture participants as transition issues come to the top of their agenda.
- The goal of the service should be about getting a process started, or to keep it moving, and not about producing a document. This introduces some complexity in defining the scope of the service to be provided, and in costing the service.
- Signposting and brokering relationships with other professional service providers is a key service that a Getting Started intervention can usefully provide. Understanding and addressing any capacity constraints within advisory services is therefore another important element of supporting farm succession and transition processes for a given industry or region.
- In this Australian example, there was a clear reluctance on the part of farmers to pay for such a service up front, even though in retrospect they can see its value.
- It needs to be clear in the design and implementation of the service that it is the interests of the farm family, and not the interests of industry, that are paramount.

The second research question concerned the implications for agricultural policy of viewing succession planning *as a process.* I will address this question in the specific context of Australia's industry-led, hybrid agricultural advisory system, and leave it to others to determine how the findings can be translated into other contexts. If succession planning is a process that takes place over an extended period, then services and advice to assist with this process must be available in small "packets", as and when required, rather than in the form of a single large and supposedly complete succession planning service. A one-off planning service may be able to document at a particular point in time a preferred future state and what appears a feasible pathway towards it; but the evidence from this study is that families and their farm businesses are likely to encounter many unexpected diversions and sticking points as they progress. One can only see as far as one can see at any particular point, and as the journey continues, new obstacles and/or opportunities come into view.

One possible industry policy response to the long-term process nature of succession is for succession and transition planning advice to be woven into other advisory activities and service offerings that farmers already engage with regularly. This could include their interactions with their farm management consultant (if they have one) or with their milk factory field officer. This then requires these advisors to have the skills and knowledge to engage usefully with farmers on succession issues, it requires these individuals to be proactive about raising succession issues for discussion, and it requires them to be able to direct farmers to other more specialist services that might be needed at any particular time. The work required by industry is firstly to design succession planning into these other advisory interactions, and secondly to build the skills and knowledge of the advisors involved.

A second possible response is to include a specialist succession planning service like Getting Started in an industry's portfolio of service offerings, alongside for example its services on grazing management and milk quality. The study report here has shown that a focused one-on-one advisory service delivered by a skilled generalist agricultural advisor can effectively assist farm families to identify the specific advice they need next, and can assist in brokering a connection to this advice.

While the cost per farm for the Getting Started service was modest (~A$2,000), the industry service organisations currently do not consider it economically feasible to offer this as a free

service to all 6,100 Australian dairy farms, even accounting for the fact that only a small portion of this number would want to access the service in any given year. Dairy Australia's desire is that over time a service like this will come to be seen by farmers as a normal and essential part of farm business operations, in the same way that the services of a vet or refrigeration mechanic are, and thus that willingness to pay will increase. This may indeed occur. But for now, unless resources are provided to support farmers to take the initial steps in tackling succession issues, it appears likely that the well-documented resistance to this activity will prevail, and the industry-scale issues linked to poor succession planning will continue.

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Intergenerational family farm transfer: an insight into the human side

Conway, S.[1], McDonagh, J.[1], Farrell, M.[1] and Kinsella, A.[2]

[1]*Discipline of Geography, National University of Ireland, Galway*

[2]*Teagasc Agricultural Economics and Farms Surveys Department, County Galway, Ireland*

Abstract: Similar to what is occurring on a global scale, Irish agriculture is populated by an older generation of farmers. Consequently, intergenerational family farm transfer is increasingly viewed as crucial to the survival, continuity and future sustainability of the family farm and agricultural sector. A review of existing research highlights how financial incentives that encourage succession and retirement from farming have stimulated little change in the behavioural intentions and attitudes amongst elderly farmers. This paper sets aside economic enticements and presents an insightful, nuanced analysis of the human factors that influence the process of transferring the family farm from the perspective of the senior generation. This research employs a multi-method triangulation design, consisting of self-administered questionnaires in conjunction with complimentary Problem-Centred Interviews, to acquire data on the complex emotions involved in the process. The prominent themes to emerge from the empirical data are farmer's concerns regarding potential loss of identity, status and control upon transferring management and ownership of the family farm and retiring. There is also a cultural expectation within the farming community that 'farmers don't retire'. The paper concludes by suggesting that future policies and programmes encouraging family farm transfer must develop effective strategies that address the emotional well-being of elderly farmers.

Keywords: Family farming, succession, retirement, farm viability, rural sustainability

Introduction

Interest in intergenerational family farm transfer and its impact on the farming economy has grown considerably amid concerns about the sustainability of an ageing farming population (Ingram & Kirwan, 2011). Global demographic trends reveal an inversion of the age pyramid with those aged 65 years and over constituting the fastest growing sector of the farming community. In Europe, preliminary results from Eurostat's most recent Farm Structure Survey indicate that 6% of farmers were aged 35 and under in 2013, while over 55% were aged 55 and older (European Commission, 2013; European Commission, 2015). The situation in the Republic of Ireland is closely analogous to that of its European counterparts; in 2010, only 6.2% of Irish landowners were under 35 years of age whilst 51.4% were over 55 years old (CSO, 2012). This 'greying' of the agricultural community, will see the number of ageing farmers facing farm transfer accelerate in the coming decades (Mishra & El-Osta, 2007), a situation meriting serious and timely investigation.

Intergenerational farm transfer is a multifaceted process that encompasses three distinct but interrelated processes: succession, inheritance and retirement (Gasson & Errington, 1993). Succession is viewed as managerial control which is gradually relinquished, retirement is associated with the owner withdrawing from active participation in the business of the farm, while inheritance is the final stage when all of the business assets are legally transferred to

the successor (Errington, 2002). Whilst conceptually separate, these processes are linked, with succession seen as the 'mirror image' of retirement; as the new generation succeeds, the old generation retires (Gasson & Errington, 1993; Errington & Lobley 2002; Uchiyama et al., 2008, Lobley, 2010). The terms 'succession' and 'retirement' will thus be used interchangeably throughout this paper.

Intergenerational family farm transfer is a complex and highly topical issue both in terms of society and farm sustainability. A low rate of entry into farming will lead to fewer numbers of farmers and may have profound implications for the industry, the countryside, land use and the broader sustainability of rural communities (Ingram & Kirwan, 2011; Goeller, 2012). Equally, it has been recognised that the 'twin process' of succession and retirement, if not addressed adequately, can be a period of considerable stress, both emotionally and financially, for family farm households (Burton & Walford, 2005). More broadly, many investigations of intergenerational family farm transfer have paid limited attention to the lack of successors willing to take over, despite the well documented deep-rooted reluctance and resistance by elderly farmers from Ireland and further afield to transfer managerial duties to younger generations and retire from farming (Gasson & Errington, 1993; Kimhi & Lopez, 1997; Gillmor, 1999; Defra, 2002; Foskey, 2005; Vare, 2006; Bika, 2007; Calus et al., 2008; Lobley et al., 2010; Ingram & Kirwan, 2011; Barclay et al., 2012, Bogue, 2013; NRN, 2013). The prevailing reason for an ageing farming population from census to census is also reported to be the lack of 'new blood' entering the industry (ADAS, 2004; Hennessy & Rehman, 2007; DGIP, 2012; Zagata & Lošťák, 2014). However, despite changes in agricultural support regimes, challenging economic environments and socio-cultural changes in farming, the upsurge in demand from young people for education and training in agriculture in the Republic of Ireland and beyond provides contradictory evidence and indicates a renewed interest in pursuing farming as a career (Teagasc, 2011; Whitehead et al., 2012; Baker, 2012). Therefore, while the successor is undoubtedly a crucial player in the succession and retirement planning process, it is crucial to realise that the successor is not alone in resisting the process. In many cases the older generation also experience difficulties actively engaging in or mobilising the process and as a result often exert strong pressures to avoid the emotion-laden issues of succession and retirement. A particular focus of this paper therefore centres upon the notion that older farmer's emotions are not given due consideration (Kirkpatrick, 2013) when discussing the interrelated processes of intergenerational family farm transfer: succession, inheritance and retirement.

Undue emphasis on economic aspects of intergenerational family farm transfer has led to an overly simplified view of the factors influencing the decision-making process. Agricultural policy, designed to assist older farmers to exit farming, focuses on encouraging those generating low returns to retire from the industry but is clearly not designed to deal with the specific issues facing ageing farmers (Rogers et al., 2013). This human dynamic is disregarded, with little value placed on the notion that farming is not just a job or something driven by a desire to make money; it is a passion and a lifestyle (ibid). It is a byzantine mix, whereby the already problematic economic business dimension is further complicated by a more complex emotional aspect. There is clear lack of understanding of the views of elderly farmers on their concerns, fears, needs and future plans. It is naïve therefore of policy makers and practitioners not to consider the potent mass of emotional and psychological values attached to the farming occupation for older farmers 'beyond the economic' (Pile, 1990, p. 147).

This paper sets aside financial enticements and presents a more nuanced analysis of the factors that influence the unwillingness and reluctance amongst older farmers towards relinquishing management and ownership of the family farm and ultimately beginning the process of their retirement (Gillmor, 1999; Bika, 2007; Ingram & Kirwan, 2011). Instead of focusing on the 'mechanics' of family farm transfer (Price & Conn, 2012), we aim to dissect the role that emotional ties to the farm and farming occupation plays on decision-making processes surrounding farm succession and retirement from the older farmer's perspective. Consequently, this paper has global relevance and will be of particular interest to countries like the Republic of Ireland where the age profile of the farming community and the rate of succession and retirement have been matters of concern and unease for decades (Commins, 1973; Commins & Kelleher 1973; Gilmor, 1999; Bogue, 2013; NRN, 2013). The next section reviews the relevant family farm transfer literature, followed by a summary of the methodology employed in the research. Research findings are then discussed with the latter part of the paper drawing some exploratory conclusions.

'Greying' of the Farming Population

The farming community increasingly consists of a farm population with a high age profile. This 'greying' of the farming population has major implications for government policy (Rogers et al., 2013), raising concerns about the need to reinvigorate the industry with new, or at the very least fresh, blood, alongside arguments that an elderly farming population is likely to be less competitive in the current market place because they are slower to adopt new innovative agricultural technologies (Ingram & Kirwan, 2011). In the Republic of Ireland for example, it is argued that significant changes and modifications to boost the competitiveness and production efficiency of Irish agriculture through land mobility (i.e. transfer of land from one farmer to another, or from one generation to the next) and structural change are required in order to realise ambitious growth targets set out in Food Harvest 2020 (DAFF 2010; Läpple & Hennessy 2012; Bogue, 2013; NRN 2013). Specifically, not unlike elsewhere in the world, there have been calls for deterrents obstructing the passage of farmland from the older to younger generation of farmers to be overcome as the intergenerational transfer of the family farm is viewed as crucial for future prosperity in the farming industry (Connolly, 2009). In the Republic of Ireland however, entry to farming through channels other than inheritance is rare due to both the limited availability and the high cost of land (Hennessy & Rehman, 2007). It is estimated that only 0.3% of the total land area in Ireland was put on the market in 2011 (Irish Farmer's Journal, 2012). A recent report on 'Land Mobility and Succession in Ireland' claims the lack of land mobility currently experienced is stifling agricultural growth and development by preventing young 'enthusiastic' farmers gaining access to productive assets (Bogue, 2013). In an effort to alleviate concerns over an ageing farming population and improve competitiveness, the Irish policy environment has explored various methods of stimulating and enticing intergenerational family farm transfer for some time. These included several well-documented financial incentives which encouraged early retirement from farming; albeit very little change in attitudes towards intergenerational transfer of the farm has come about (Ryan, 1995, Gillmor, 1999; Bika, 2007). Early retirement schemes have had only marginal success in restructuring the farming sector. Ryan (1995) suggested weak participation was the result of several factors including low retirement benefits and a cultural resistance to leave farming. Other attempts included a concerted effort to ensure the most tax efficient means of transferring ownership and wealth of farms (Meehan, 2012), which again yielded nothing like

the required result. In fact, despite these financial incentives, reluctance of older farmers to exit or retire from the farming sector to facilitate young farmers who have a desire to start up persists.

The acceptability of retirement schemes from farming is likely to be a personal dilemma for many elderly farmers, particularly as they adjust to a major change in their occupational role (Commins, 1973; Gillmor 1999). Understanding when to relinquish control from the family farm can be difficult to recognise for many farmers in that few other businesses generate the emotional connections that farming does (Kirkpatrick, 2013; Rogers et al., 2013). Farming life throughout the world is characterised by the almost inseparable intimate integration of home, work, memories and family tradition (Barclay et al., 2012; Kirkpatrick, 2012; Uchiyama & Whitehead, 2012). In fact, Lobley et al. (2004) and previously Gillmor (1977; 1999) pointed to distinctive characteristics of farmers, in that they tend to have deep rooted emotional attachment to the key business assets they own, such as particular tracts of land or animals, thereby increasing their reluctance to relinquish ownership and leave farming. Kirkpatrick (2013) argues that in many cases the older farmer's sense of place and purpose attached to the family farm supersedes economic imperatives encouraging the transfer of the family farm to the next generation. This indicates the overwhelming significance of lifestyle over profit (Price & Conn 2012). Recent research conducted in the Republic of Ireland, touched on this, alluding to the fact that "*apart from the economic driver of payments retaining elderly farmers on land, there are also psychological drivers involved*" and "*addressing the issue of low levels of mobility must also take cognisance of these psychological barriers"* (NRN, 2013, p. 6). This research came 40 years after Commins (1973) first stressed that retirement policy, "*with economic objectives, should not ignore possible social consequences or wider issues of human welfare"* (p. 45). However, to date, such recommendations have largely been ignored, resulting in the formulation and implementation of largely unsuccessful farm transfer policy strategies, such as Early Retirement Schemes, which have little or no regard for elderly farmer's emotions. It is in probing these issues further that this paper now turns.

Methodology

This research employed a multi-method triangulation design in an attempt to secure an in-depth understanding of the emotional factors that influence the process of transferring the family farm business from the perspective of the senior generation. Cohen and Manion (1986) define triangulation as an "*attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint"* (p. 254). For the purpose of this study triangulation was assured using a collection of both quantitative and qualitative data through the use of self-administered questionnaires in conjunction with complimentary Problem-Centred Interviews.

A detailed survey was initially undertaken with farmers in attendance at a series of 'Transferring the Family Farm' clinics hosted by Teagasc (the agriculture and food development authority in Ireland) to investigate the behavioural intentions and attitudes of older farmers towards succession and retirement from farming. These clinics facilitated by Teagasc took place at 11 locations throughout the Republic of Ireland in September and October 2014, with local solicitors, accountants and other experts also in attendance for one to one meetings with attendees. These events also provided an ideal opportunity to recruit

participants located throughout the Republic of Ireland for interview at the second phase of data collection. Representatives from each of Teagasc's advisory service regional units organised and participated in these clinics (delivered free of charge) following a series of seminars and a successful pilot event in February 2014. As part of Teagasc's campaign to advertise and promote these 'Transferring the Family Farm' clinics, invitations were sent out to each of their 43,000 farming family clients to attend. This sample therefore provides an acceptable nationally representative sample of the Irish farming population across a range of diverse regions, farm sizes and operations.

In addition to probing the succession and retirement intentions of older farmers, survey respondents were also asked to state the degree to which they agreed or disagreed with a set of statements, measured on five-point Likert scales. Based on a review of family farm transfer literature, these psychometric scales drew on factors that influence and hinder the succession and retirement process from the perspective of the senior generation. The statements therefore tested a number of hypotheses expressed in this paper by providing an insight into: (i) older farmers' attitudes and opinions regarding the transfer of the family farm to the next generation; and (ii) their emotional connection to their farm and occupation. Survey participants were also given the option of supplying their contact details for interview at the next stage of the research process. In terms of data analysis, questionnaire data were coded and then analysed using frequency distribution tables and a series of cross-tabulations performed in the Statistical Packages for Social Sciences (SPSS) programme.

In order to validate, deepen and build on the quantitative data gathered at the Transferring the Family Farm Clinics, the second phase of data collection consisted of a Problem-Centred Interview approach (Witzel, 2000). Witzel (2000) explains that Problem-Centred Interviews can be combined with questionnaires in order to "*solve the problems arising in connection with samples and to relate the results generated by different procedures"* (p. 3).This qualitative methodology presented a viable approach to further investigate the behavioural intentions and attitudes of older farmers towards succession and retirement from farming as it gathers objective evidence on human behaviour as well as on subjective perceptions and ways of processing social reality (Witzel, 2000). Although Problem-Centred Interviews contain open ended questions to ensure that respondents can freely and extensively produce a relatively natural dialogue, one of the key principles of this form of interview is that it is centred upon a specific social phenomenon that the interviewer keeps in mind throughout the conversation. A predetermined Problem-Centred Interview guideline therefore allows for a greater emphasis on the specific aspects of the issue that need to be analysed, which might not be tackled in a narrative interview setting (Scheibelhofer, 2005). This methodological tool also provides a framework of orientation to ensure comparability of interviews (Witzel, 2000). Following frequency distribution and cross-tabulation analysis of survey data obtained at the Teagasc clinics, in conjunction with an additional review of relevant literature in the field, it was possible to draw up a specific Problem-Centred Interview guideline containing pre-formulated questions on the issues that were identified to be subjectively significant to the sample farming population. Given the personal nature of the issues under investigation the use of individual face-to face interviews was deemed the most appropriate means of obtaining information from the senior generation of the farming community. All interviews were carried out in the homes of the respondents. The interviews lasted up to 2.5 hours and were tape recorded, transcribed in full and assigned pseudonyms to protect participant's privacy. Content analysis (Mayring, 2000) was used to analyse the data collected and identify categories and themes. Relevant

quotes from the interviews were then integrated into the various themes in order to support particular findings.

Results and Discussion

The presented findings are the result of a triangulation of quantitative survey data obtained at the Teagasc Transferring the Family Farm clinics and complimentary Problem-Centred Interview questions formulated upon an analysis of survey data and relevant literature in the field. Over 2,800 farmers attended the 11 clinics and all of the 417 farmers who were randomly selected and then approached to participate in the study agreed to complete the questionnaire, resulting in a 100% response rate. However, as older farmers are the target population of this study, only respondents aged 55 and over have been included in the analysis. The reasoning for specifically focusing on farmers aged 55 and over is that one of the terms and conditions for farmers intending to retire under the Early Retirement Scheme (ERS 3) launched in Ireland in June 2007 was that participants must have been between the ages of 55 and 66 to be eligible. Questionnaires with missing data were also eliminated from the survey to avoid biased statistical results. After both these processes, a total of 324 complete questionnaires qualified for analysis; 60% (n=194) of these respondents also gave their consent to be interviewed more in depth. A 10% (n=19) sample of these farmers located throughout the Republic of Ireland were sourced and subsequently interviewed using a systematic sampling technique. The overriding themes to emerge from the content analysis of the empirical research were farmers' concerns regarding potential loss of personal identity and stature and the fear of losing their positional control upon transferring their farm and retiring from farming. Problem-Centred Interviews with farmers also highlighted the divergence of opinion and uncertainty between retirement expectations and retirement realisations, resulting in the decision to retire being difficult to execute and follow through.

Findings from the questionnaires carried out at the Teagasc clinics indicate that: 33% (n=108) of the total number of respondents over the age of 55 in attendance have not considered retiring from farming in the future; 45% (n=145) stated that they have considered retiring; 21% of farmers (n=67) were uncommitted in their answer; and one farmer did not have any opinion on the matter. As these clinics were geared towards farmers who are considering transferring their family farm, one would expect that the majority of those in attendance would be open to the idea of retirement, however as these findings illustrate, one third of respondents had not even considered it. Problem-Centred Interviews conducted with farmers shed some light on why this is the case. Interviews reveal that the farm and farming occupation completely encapsulate the lives of many farmers. Jack - a 72 year old dairy farmer from the South East of Ireland - has no intention of retiring from farming, despite being in an official farm partnership with his son:

"Have I considered retiring? Never… I couldn't, I just couldn't! I'd be always saying I'll take it easy, but I couldn't, I have that drive to keep going like…. shur I am up every morning at half 6 and I could be going until 10 or 11 o'clock at night, so I couldn't even imagine it. I make out it wouldn't be good, because I think it's important to be active, I enjoy it like. I like to farm. But if I had to retire, it would not be for a few more years; I'm only 72 like, so definitely not for a few more years".

Interestingly, 32% of the 145 questionnaire respondents who considered retiring in the future agreed that they could not imagine what they would do if they permanently ceased all farming activity. Furthermore, 64% of these farmers also agree that the lifestyle quality from being a farmer is far greater than can be quantified by any financial incentive to leave farming. This pattern of findings is consistent with psychological research, showing that attitudes are not necessarily related to behaviours (e.g. Ajzen, 1991). Luke - a 69 year old mixed livestock farmer from the West of Ireland - admitted that he had thought about retiring, but quickly dismissed the idea:

"Well I would think about it sometimes, but shur where am I going to retire to like? It's what I do and it is all I know what to do. Tis fine you could go on holidays there for a week or 10 days, my wife and I often did, but you would just be delighted to go back to the farm, back doing something again, besides doing nothing…. It's hard to retire from farming, because you are always pottering around yanno, it is not possible to retire or leave… I couldn't possibly imagine what I would do next".

These findings also mirror previous family business research by Gagnè, et al. (2011) who found that the planned retirement date of the older generation was unrelated to their attitudes toward retirement or to their concrete planning for retirement. According to Gagnè, et al. (2011) "*simply because business leaders have a date in mind for their retirement does neither mean that they perceive their retirement in a positive light nor that they concretely take steps to plan it"* (p.300). The above mentioned prominent themes of (i) loss of personal identity; (ii) changes in social stature; and (iii) difficulty relinquishing control, that were identified as having a significant hindering and deterring influence on the process of transferring the family farm from the perspective of the senior generation, will now be discussed. The themes will be linked to relevant issues in family farm transfer literature and effectively portrayed in selected comments direct from the interviewees.

Loss of personal identity

Results from the empirical research indicate that the potential loss of personal identity and self-esteem brought about by transferring managerial control and retiring from the family farm business, can have a delaying if not detrimental effect on the process. 71% of questionnaire respondents at the Teagasc clinics agree with the notion that farming is not only their job, but also their lifestyle, past time and social outlet. This all-encompassing ideology of the farming occupation is aptly explained by Aoife - a 68 year old mixed livestock farmer interviewed from the Midlands of Ireland:

"Farming means everything. I get up in the morning to farm, I look out at the weather to see how it will affect my farming. Where I go, who I meet, who I talk to, everything is farming, it is my life, it makes me what I am… It is my whole life, I don't have any other interests"

Moreover, 87% of questionnaire respondents agree that the farm represents years of hard work and what they have managed to achieve over their lifetime, while 68% agree that their farm and occupation have a greater symbolic importance than a financial one to them. Josh - a 70 year old tillage farmer from the South East of Ireland - gives an insight into non-monetary values associated with the farm and farming profession:

"The farm means an awful lot to me, we have been here for 12 or 13 generations, we go back to 1725, so it means a lot to me. It means a lot to me in the sense that I inherited it and I would

never ever contemplate selling it… being able to farm it well and make a living out of it has given me a huge sense of satisfaction throughout my lifetime. I'll never be a millionaire but I've enough money to put food on the table and to live a good life and that's the most important thing".

These findings also reinforce previous research by Rogers et al. (2013) who argue that identity issues which influence farm management decisions cannot be explained by economics alone. Problem-Centred Interviews conducted with farmers discovered that the majority of interviewees felt that being identified as a farmer is vitally important to their sense of self-esteem and self-worth in the farming community and the wider social world. For example, Mark - a 61 year old Dairy farmer from the East of Ireland - explains that:

"Farming isn't just my job; it's a way of life for me. I am known far and wide as a farmer at this stage. I am not known as anything else. In fact, I wouldn't wish to be known or identified as anything else! I am proud to be a farmer and I would like to think that being a farmer defines who I am".

A number of farmers interviewed believed that they would be seen or perceived differently by others as a 'retired farmer' and therefore struggled to come to terms with the prospect of doing so. Ian - a 67 year old dairy farmer from the South of Ireland - recalled how another farmer's experience of an identity crisis upon retiring from farming has warned him away from the process:

"I can remember speaking to some fella a number of years back and he said that when he sold his farm and gave up farming that he was almost a non-identity afterwards, he wasn't a farmer anymore, he wasn't anything… He said that afterwards he never felt that he could go to farming meetings anymore because all his life he had been a farmer and next thing he wasn't and ya know that story made a major impression on me and has even influenced my own decisions to keep going and not retire ever since".

Changes in social stature

In relation to loss of status, findings from the questionnaire also indicate that negative connotations associated with the idea of succession and retirement, especially at a time when the older generation seek purpose in life and to feel needed, respected and valued as they age (Rogers et al., 2013), can become part of an older farmer's indoctrination, thus derailing the process. 87% of farmers surveyed agree that 'the concept of retirement is not popular or well-regarded within the farming community', a situation unchanged from research carried out in the Republic of Ireland in the 1970s (Commins & Kelleher, 1973; Commins, 1973). Following discussions with farmers on this issue, it became strikingly apparent that there seems to be a cultural expectation within the farming community that 'farmers don't retire'. Those who do retire are generally perceived by interviewees to have a defeatist attitude or else seen to have no option but to do so due to ill health. For example - mixed livestock farmer Colm, from the South West - explains that:

"Farmer's don't retire. I'd say the only reason a farmer would retire is because of circumstances in their personal lives or their health… Then again there may be odd people out there who just like to retire and walk away from farming but they would be very much in the minority, I would imagine. I just think it would be seen as defeatist to retire".

Numerous interviewees commented that they would also feel isolated and separated from the rest of the farming community if they were to retire from farming. For example - 70 year old beef farmer David from the North West of Ireland - explained that:

"If you give up farming you are gone, I mean you wouldn't be involved anymore. I think other farmer's wouldn't take a bit of notice of me if I retired and I'd imagine that they wouldn't have any interest in the world trying to talk to me about farming either because it would not be worth their while to do so anymore. I would be very conscious of that".

Regardless of their age, each farmer interviewed emphasised the essential role that they continue to have in the day-to-day operation of the farm. The majority of interviewees also plan to use their experience and skill to compensate for decreases in physical strength inevitable with age. For example - tillage farmer Josh from the South East - explained that he will continue to play a key role in the farm even when he is no longer physically able to provide manual labour:

"Generally speaking I would say that while you can do hands on farming, which I've done for the past 40 years or 50 years, keep doing it and when you are unable to do so you can always have an input from a management perspective and from an experience perspective…. That way you can still have an influence and play a productive role in the farm".

Rossier (2012) previously pointed out that "*decades of hard work have left their mark on those who farm for a living"* (p. 90) and therefore keeping up activities on the farm in old age and remaining embedded in the farming community serves to create meaning, value and purpose in their lives (ibid). 71% of farmers surveyed agree that it was hugely important for them to be still viewed as a skilled, productive farmer amongst their peers to maintain their status in the farming community. A major complicating factor for older farmers faced with the prospect of transferring the family farm, relinquishing control and retiring, may be the fear that their social stature in the farming world practically evaporates overnight, leading to a sense of insignificance and a lack of purpose.

Difficulty relinquishing control

In addition to an anticipated loss of identity and status, results from the empirical research indicate that the senior generation of farmers may resist succession and retirement planning as a means of sustaining their positional dominance as head of the family farm. Surprisingly, 71% of respondents who had not considered retiring from farming in the future have in fact identified a potential successor to their farm. This somewhat contradicts the fact that 60% of these very farmers felt that the younger generation had the required experience, knowledge and skills to take over from them. Problem-Centred Interviews identified that the idea of relinquishing control of the farm was not popular amongst many participants, in fact some went so far as to say that they would experience great difficulty in doing so, even if it was to their own children (see Barclay et al., 2012; Price & Conn, 2012; Whitehead et al., 2012). For example - beef farmer David from the North West - has great difficultly transferring over the family farm to his son:

"I have a son who is 30 this year and he wants to settle down and farm here and I suppose in a sensible ideal world I should transfer over the farm to him and my wife and I should buy a house in the local village or somewhere else and let him move in here. Well that would be in

a sensible world, but I wouldn't even consider or suggest that. I am certainly not prepared to let go of what I have just yet".

Results from the research identify that 60% of farmers who have not considered retiring from farming agree with the suggestion that they would no longer be seen as having a leading role in their household and local community if they relinquished control and retired. Problem-Centred Interviews confirmed that such a prospect places significant emotional stress on many participants. Tillage farmer Josh from the South East explains:

"Well I think history would tend to prove that that is the case. I know a lot of cases where farmers have hung on and not transferred over but the minute they handed it over then their relationship and role suddenly changed within the family and that is a danger. Retirement changes the relationship with other farmers too, it certainly does and that is also a worrying factor".

These findings confirm the premise put forward by Pitts et al. (2009) who pointed out that the *"senior generation might be reluctant to engage in succession planning, as surrendering control of the farm relegates them to a more peripheral role"* (p.61).

Conclusion

The findings of this study provide a nuanced understanding of the complex and competing emotions currently derailing and deterring intergenerational family farm transfer. Many farmers' identity and self-esteem are strongly attributed to their occupation, and as a result sacrificing one's professional and personal identity upon transferring managerial control of the farm and retiring is a concept that they find difficult to accept. Our research finds that farmers resist transferring the farm on the basis of an anticipated loss of the recognition and social status that has accompanied their position as an active and productive farmer in society. Subsequently the senior generation resist succession and retirement planning as a means of sustaining their position as head of the family farm. The thought of being 'retired' is found to be particularly arduous for them. Consequently even the most sophisticated of family farm transfer plans are of little avail if policy makers and practitioners are not adequately cognizant and understanding of "*the language of farming"* (Burton, 2004, p. 212) and how painful it is for the older generation of farmers to 'let go'.

Empirical findings brought focus on the suitability of farm transfer policy strategies such as Early Retirement Schemes put in place in the Republic of Ireland over the past four decades. These schemes, we argue, had little or no regard for older farmers' emotions and were excessively preoccupied with financial incentives to encourage the process. While such economic efforts to confront the issue are important, and indeed have been in many aspects well meaning, empirical findings here have identified many more facets to the farm transfer decision-making process, which in large part have been neglected. The outcome has been a derailment of the process in many cases. For example, the eligibility requirements for farmers entering the most recent Early Retirement Scheme for farmers (ERS 3, June 2007), was that "*Persons intending to retire under the Scheme shall cease agricultural activity forever"*. Essentially, farmers were being asked to revise their self-perceptions upon retirement. This largely unsuccessful scheme (it was suspended in October, 2008) was completely oblivious to the mind-set of many farmers as exemplified here. Being recognised as an active and

productive farmer in society has been acknowledged as being central to a farmer's sense of self. Thus the prospect of going from being an active and productive farmer to permanently ceasing all farming activity upon retirement as demanded in this retirement scheme, forces older farmers to face a number of what could be termed, painful realities. Realities that come with the consciousness of letting go of one's professional identity, becoming a retiree and becoming more and more dependent on others. The resultant outcome leads farmers, in many cases, to resist the process.

In an era of unprecedented transition in global agriculture, we acknowledge that the global phenomenon of an aging farming population calls for and justifies the development of various incentives to stimulate and entice family farm transfer. This will enable enthusiastic young farmers to gain access to productive assets and subsequently improve the competitiveness of the agricultural sector. One such policy is the Farm Partnership Model, where two or more partners operate their enterprises jointly. This model can be seen as a stepping stone to farm transfer, however, similar to the sporadic uptake of previous Early Retirement Schemes, the low number of farm partnerships currently in operation in the Republic of Ireland indicates that policies and support need to be amended in order to encourage greater participation. In an attempt to spur on the process, the Department of Agriculture, Food and the Marine launched a collaborative farming scheme in 2015, funded under Ireland's Rural Development Programme and co-funded by the European Agricultural Fund for Rural Development (EAFRD), to "*encourage the establishment of new farm partnership arrangements by contributing to the legal, advisory and financial services costs incurred by farmers in the drawing up of their farm partnership agreement"* (DAFM, 2015). While this is still very new, what is interesting here is that this scheme has again a simplified view of the factors influencing the process and fails to deal with the complex emotional dynamics facing ageing farmers identified in this research.

We argue that, for any new initiative put in place to support and encourage intergenerational family farm transfer, policy must be accompanied by a comprehensive set of interventions to deal with the personal and social loss an older farmer may experience upon transferring the family farm. In order to do this, we advocate that future policies and programmes relating to family farm transfer must develop effective strategies that address the emotional well-being of elderly farmers. For example, on its own, and with the numerous perceived negative connotations associated with it identified, perhaps the term 'Early Retirement Scheme' is no longer appropriate for policy to use in a farming context. Perhaps the term 'Farm Progression Scheme' would be more effective as it portrays a sense of purposefulness rather than one of cessation to an elderly farmer. In addition, instead of reporting that farm management decisions are in the hands of a generation who may be more resistant to structural change and growth, policy makers and key stakeholders need to embrace, publically promote and recognise the older generation's invaluable store of knowledge, skills and years of experience working on the farm that the younger generation have not yet accumulated. The feeling of still being valued and needed in society may reinforce the older farmers' morale and sense of purpose in the face of the gradual diminishment of their physical capacities. This may help to diminish the stigma and defeatist stereotype associated with transferring the family farm and subsequently promote a more positive and wilful attitude towards the process over time. The development of such strategies concerning the human dynamics of family farm transfer has the potential to greatly ease the stresses of the process. Anyone who considers such recommendations to be too idealistic, should remember that we all inevitably have to face the

prospect of letting go of our professional tasks and ties in our old age. No one can avoid ageing and, as this research has identified, most elderly farmers opt to maintain the facade of normal day to day activity and behaviour instead of retiring. As such, this paper, in attempting to understand the world as farmers perceive it, can be drawn upon to inform future policy directions and as a consequence prevent older farmers from being isolated and excluded from society almost by accident rather than intention. This research is but a start however and the insights given and issues raised will hopefully stimulate further investigations along these lines.

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