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Importance of building bridging and linking social capital in adapting to changes in UK agricultural policy

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Abstract

As the UK leaves the European Union, the Common Agricultural Policy (CAP), which for decades has dictated how and when farming support is delivered, will be replaced with a new UK agricultural policy which will see UK farmers, especially upland livestock farmers, facing a more challenging economic environment and a significant change to the way in which farming support is delivered. This study used a series of interviews with UK farmers across differing locations and categories to ascertain how levels of social capital may hinder or enhance a farmer's willingness to embrace future agricultural policy. We found that more conventional farmers who have never participated in agri-environment schemes and those currently in government-run schemes display high levels of bonding capital and low levels of bridging and linking capital which may hinder their ability to adapt to change. In contrast, farmers who embrace a pubic goods approach to land management displayed high bridging and linking capital and are more likely to work with government officials to adapt to policy change. Communities are more likely to become sustainable if they have access to government support and advice, and if relationships with other community members and stakeholders with an

interest in rural communities, the natural environment and land management are encouraged and maintained.

Keywords: Social capital; policy change; Brexit; networks; rural communities; trust.

1. Introduction

The UK government is responding to overwhelming evidence that greenhouse gases (GHG) are driving global climate change by pledging to reach net zero GHG emissions by 2050 (CCC, 2019; Skidmore, 2019.). Achieving this target will require changes to farming and land use putting more emphasis on carbon sequestration and biomass production (CCC, 2019). In future, farmers will no longer receive Basic Payment Scheme (BPS) support, which pays per hectare of agricultural land if cross compliance rules, which state they must keep land in a good agricultural and environmental condition, are adhered to (Rural Payments Agency, 2019). Instead, farmers wishing to receive financial support will have to embrace sustainable land management (SLM) practices which support government targets (Defra, 2018; Welsh Government, 2019). Change is inevitable and farmers must decide whether to adopt or reject SLM practices.

The innovation-decision process (Rogers, 2010) identifies five stages that an individual must go through before adopting or rejecting a new idea. 1. Knowledge – the individual is exposed to the idea and how it is going to work. 2. Persuasion – the individual forms a favourable or unfavourable opinion of the idea. 3. Decision – the individual decides to adopt or reject the idea. 4. Implementation – the individual puts the idea into practice. 5. Confirmation – the individual seeks reinforcement of their decision. In all these stages an individual's network links are important determinants in their adoption of new ideas (Rogers, 2010). Decision-makers are influenced by people for whom they have respect or who are important to them (Broers et al. 2019; Cofré-Bravo et al., 2019). Social capital is defined by Putman (1995) as the characteristics of social organisation, such as social networks, norms and social trust, which

foster coordination and cooperation among community members. Cultural capital is the accumulation of knowledge, behaviours, and skills that a person can tap into to demonstrate one's cultural competence and social status (Bourdieu, 1977). Social and cultural capital are increasingly acknowledged to be of critical importance in farmers' decision-making (Mathijs, 2003; Burton et al., 2008; Hunecke et al., 2017; Cofré-Bravo et al., 2019). Social capital can be further categorised as, i. bonding (exclusive) social capital which focuses on ties of solidarity between similar groups of people (Heenan, 2010), ii. bridging (inclusive) social capital which refers to horizontal trust and reciprocal connections between diverse individuals such as between farmers and others (de Krom, 2017; Heenan, 2010), and iii. Linking social capital which creates forms of power and influence in community interactions (Woolcock, 2001; Stanton-Salazar, 2004) and enables access to resources, ideas and information from formal institutions beyond the community (Pretty, 2003). An understanding of social capital levels within farming communities helps policymakers understand how farmers access information, who are the influencing factors in the decision making process and what networks give access to the knowledge and resources that farmers need to adapt. If farmers are to achieve change in long-term pro-environmental behaviours they need to build the 'bridging social capital' that will give them access to new knowledge (Cofré-Bravo et al., 2019) and gain them appreciation from stakeholders out-with agricultural networks (de Krom, 2017; Polman and Slangen, 2008).

2. *Social capital and the farming community*

Without social capital, many aspects of social life that involve co-ordination between or within social groups will be greatly impoverished (Burton et al., 2005). Communities endowed with a rich stock of social networks and civic associations are likely to be in a stronger position to deal with crisis, tensions and challenges to the community, such as those arising from agricultural policy change (Diaz and Nelson, 2005). Historically, communal farm tasks such

as hay/silage making, sheep shearing and livestock fell gathering where farmers came together as a community, provided an opportunity for the generation of social capital (Burton et al., 2005). However, recent developments in agriculture have witnessed the decline of co-operative working practices, a decrease in time available for co-operation, and the continuing decline in the number of upland farmers (Burton et al., 2005; Heenan, 2010). This in turn leads to decline in the overall levels of social capital in farming communities (Burton et al., 2005). Strong levels of bonding capital created through agricultural related activities, fosters knowledge exchange, creates lobby groups and gives access to new markets and ideas (Burton et al., 2005). However, strong levels of bonding capital often found within tight knit communities can also reduce the flow of new ideas into the group. This can result in parochialism and inertia which can create resistance to both compromise and change (Gargiulo and Bernassi, 1999; Flora, 2004). Bridging social capital is arguably more valuable than bonding social capital when adapting to change (Monteil et al., 2020). It allows different groups to share and exchange information, ideas and innovation and builds consensus among the groups representing diverse interests (Claridge, 2018). It has the potential to generate widespread benefits such as increased cooperation, appreciation and social ties with other regional stakeholders (de Krom, 2017; Abenakyo et al., 2007; Pretty, 2003; Putnam, 2000). However, like bonding capital there can also be a negative consequence to achieving bridging capital. Communities or individuals seeking to expand their social networks may find bridging capital comes at the expense of groups they were once able to call upon for bonding capital (Leonard, 2004). Whereas bonding and bridging social capital refer to 'horizontal' social networks and relationships, linking social capital reflects how communities are 'vertically' networked with institutions and political structures (Warren et al., 2001; Szreter and Woolcock, 2004). Hall and Pretty (2008) found farmers with higher linking social capital progressing more in their personal transition to SLM practices than farmers with low linking social capital who felt disempowered and averse to

contact with government agency staff. The organization of society itself, reflects historical, cultural, social, political, and economic processes (Greif, 1994). Therefore, relations within and between social groups at different levels of society shape the prospects for sustainable, equitable growth and just participatory governance (Woolcock, 1998). A lack of social capital may lead to a limited uptake of sustainable management practices. Where this is the case, strategies to address this would benefit from incorporating measures focused on building bridging and linking social capital, as well as trust between stakeholders (Rust et al., 2020). This paper aims to contribute to current literature on the importance of social capital in adapting to policy change through a study of UK farmers across differing locations and categories. It aims to identify levels and type of social capital being accessed by farmers in order to ascertain how levels of social capital may hinder or enhance a farmer's willingness to adapt.

3. Methodology

3.1. Sample and questionnaire

Agriculture in the uplands (altitudes >300 m above sea level) of England and Wales is usually less intensive than in the lowlands with many upland grassland areas situated within National Parks or Areas of Outstanding Natural Beauty (Hopkins and Wainwright, 1989). This study gained its sample through the snowball sampling technique. This is a strategy often utilized to overcome the problems associated with understanding and sampling populations which are difficult for researchers to access (Atkinson and Flint, 2004). In this case we used a sample from a cross-section of upland farmers in, and on the boundaries of, the Yorkshire Dales and North York Moors National parks in England and the Snowdonia National Parks in Wales. In England, contact was made with the Yorkshire Dales and North York Moors National Park Farming Officers and in Wales with the Aber and Llanfairfechan grazing association, the Henfaes Research Centre and the National Trust. These organisations contacted farmers within their network and farmers who responded were asked to identify other farmers whom we could

contact and who may be willing to participate. Thirty-seven farmers agreed to participate in the survey. However, one did not appear at the arranged time and further attempts to rearrange the interview failed and two of the recorded interviews were inaudible due to external noise interference. The study focuses on upland farmers but across all farming areas there are farmers that farm in an extensive, nature-friendly way whilst others have a more conventional production focus. Three categories of farmers were chosen to reflect these differences and to determine if levels and types of social capital also differ between farming approaches,

i. Those not in AES –farmers with a conventional production-focused approach. A move towards a 'public goods' approach would represent a significant change in farming practice.

ii. Those in AES – farmers who participate in state-run AES delivering only the prescriptions required of the scheme.

iii. The HNVF group –farmers who participate in state-run AES but also adopt farming practices which deliver environmental benefits above that required of the AES prescriptions.

Grootaert and Van Bastelar (2002) suggest a tool that integrates both quantitative and qualitative methods when measuring social capital is likely to be more useful and reliable than measures based on only one type of research methodology. As this research aims to gain an in-depth understanding of social capital levels across both the structural (relating to networks, roles, rules and precedents) and cognitive (relating to norms, values, attitudes, and beliefs) elements of social capital, both quantitative and qualitative methods were employed. Interviews were conducted on farm, using semi-structured questionnaires based on the six dimensions of social capital used by the World Bank to measure social capital (Grootaert et al., 2004), viz; Groups and Networks, Trust and Solidarity, Collective Action and Cooperation, Information and Communication, Social Cohesion and Inclusion, Empowerment and Political Action (SI

1). The World Bank's "Integrated Questionnaires for Measurement of Social Capital" (SC-IQ; Grootaert et al., 2004), which aims to strike a balance between conceptual rigor and cross-cultural flexibility and adaptability, provided a question framework which we adapted to the local settings. The average recorded interview time was 45 min but prior to the start of the recorded interview ~20-30 min was spent explaining the reasons for the interview, what was being studied, how the data would be used and participants were reassured as to their anonymity. In most cases this was done in a very informal and relaxed way but in the shorter interviews the farmer was keen to get started and move the process on as quickly as possible.

Qualitative data collection enabled us to explore the nature and extent of the farmer's participation in various types of social organizations and informal networks whilst the qualitative approach enabled the researchers to uncover subjective meanings and interpretations in a way that would be impossible with quantitative approaches (Tracy, 2019). Interview questions, adapted from the SC-IQ, retained some of the quantitative Likert questions found in the SC-IQ for categories other than groups but, because of the sample size and the qualitative nature of the interview, these were used to stimulate thought and further discussion and no statistical analysis was completed on these results. Multiple choice questions were used to gather demographics data and open questions were used to gather data on AES participation and diversification activities.

4.2. Analysis

Interviews were digitally recorded, fully transcribed and analysed using thematic analysis techniques which is a method of "identifying, analysing, and reporting patterns (themes) within data (Castleberry and Nolen, 2018). Analysis was performed through a process of (i) reading and familiarization with the interview transcripts and (ii) compiling and organizing the data across the six dimensions of social capital, used by the World Bank to measure social capital, and which formed the structure of the question set (Castleberry and Nolen, 2018). Open coding

(Goulding, 1999; Moghaddam, 2006) was used to (a) to explore how individuals interact within the community and how perceptions of community have changed over time and (b) identify differences between groups in the type and levels of social capital within the six dimensions of social capital identified by the World Bank.

To increase the reliability and validity of the process the same researcher undertook all the fieldwork on an individual basis with the farmer. Researcher effects were reduced by conducting the interviews in the farmer's home at a pace dictated by the farmer. Several tactics were employed to test and confirm findings (Hubberman and Miles, 1994). On completion of the analysis three participants were revisited to discuss and review the findings. All revisited participants agreed with the findings. The analysis was further peer-reviewed and verified by the contributors to the paper, who read through the findings making additional comments where necessary. These areas were reviewed and amended prior to submission. There are some limitations to the survey. In the sample breakdown the number of non-AES participants is smaller than the other groups mainly due to higher percentages of upland farmers participating in AES than in other areas. Participants also live and work in or on the boundaries of national parks and this could potentially have influence on views of community as levels of incomers may be higher in national parks. Future research would be useful to confirm the findings of these results in other farming communities.

5. Results

5.1. Demographics

Table 1 shows the demographic breakdown for the thirty-four study participants with viable transcripts.

Table 1: Demographics for study participants in the North York Moors (NYM), Yorkshire Dales National Park (YDNP) and North Wales (NW) by category - agri-environment scheme (AES), no agri-environment scheme (Non-AES) and high nature value farming (HNVF).

Category	Location	Farm type	Gender	Age	Type of AES	Diversification
AES	NYM	LFA Livestock	Male	60	ESS Entry/HLS	None
		LFA Livestock	Female	54	ESS HLS/Commons	None
		Mixed	Male	57	ESS/HLS	Contracting
		LFA Livestock	Male	54	ESS Entry/HLS	Riding stables
		LFA Livestock	Male	N/K	ESS Entry/HLS	None
		Arable	Male	82	ESS/Entry	Rentals
	YDNP	LFA Livestock	Male	N/K	YDNP Pilot Scheme	None
		LFA Livestock	Female	N/K	YDNP Pilot Scheme	Off farm work
		LFA Livestock	Male	57	CSS Higher level	None
		Dairy	Male	54	Capital Works	Solar panels
		LFA Livestock	Male	64	ESS/HLS	None
	NW	LFA Livestock	Male	70	Glastir Advanced	Rentals
Non-AES	NYM	Dairy	Male	65	None	AirBnb
		Mixed	Male	48	None	B&B
		LFA Livestock	Male	58	None	Off farm work
	YDNP	LFA Livestock	Male	59	None	Rentals
		Dairy	Male	29	None	Contracting
		LFA Livestock	Male	47	None	None
	NW	LFA Livestock	Male	50	None	Rentals
		LFA Livestock	Male	51	None	Off farm work
		Lowland cattle	Male	22	None	Kennels
HNVF	NYM	LFA Livestock	Female	57	ESS Entry/HLS	Off farm work
		Mixed	Female	65	CSS Higher level	Off farm work
		LFA Livestock	Male	83	ESS Entry/HLS	Off farm work
		Grassland	Male	50	NP Scheme	Off farm work
		Grassland/woodland	Male	79	ESS Entry	Off farm work
	YDNP	LFA Livestock	Male	65	CSS Higher level	Weddings

	LFA Livestock	Male	61	ESS HLS	Off farm work
	LFA Livestock	Male	50	CSS Higher level	Rentals
	Lowland Livestock	Male	66	ESS/HLS	None
NW	LFA Livestock	Male	N/K	Glastir Advanced	Off farm work
	LFA Livestock	Female	25	None	None
	LFA Livestock	Male	34	Glastir Advanced	None
	LFA Livestock	Male	31	Glastir Advanced	School taxis

5.2. Groups and networks

This is the category most associated with social capital (Grootaert et al., 2004). Here we consider the nature and extent of the farmer's participation in various types of social organizations and informal networks, and the range of contributions that the individual, within the different farmer categories, gives and receives from them. The quantitative data enabled participant groups to be clustered by type and importance. Social groups in which interviewees participate, or are members of, were grouped by type into four categories (Fig. SI1);

(i) Agricultural/land-based groups: Work related groups directly related to production

(ii) Non-agricultural/environmental groups. Work related groups, non-production related.

(iii) Political/community groups. Groups that can enable members to influence or change policy at community and national levels.

and

(iv) Social/church groups. Non-work related groups which are accessed for social interaction or leisure.

A useful classification to determine levels of social capital is the scope of the group: whether groups operate only in the community or are affiliated with other groups (inside or outside the community; Grootaert et al., 2004). Table 2 shows the mean number of groups (total and important per farmer in each farmer category and a summary of group demographics in each of the group categories).

5.2.1. Non-AES category

We show farmers in the non-AES category participating in agricultural/land-based groups (n=27) more than either the AES (n=24) or HNVF groups (n=17; Table 2). They find groups such as breed associations, farmers' unions, farmer networks, grazing associations, trade support groups and young farmer groups, more important than other group categories. Age, gender and education levels vary between members but these groups mainly consist of people within the farming community. Members of these groups frequently interact with people with similar interests to them but they rarely interact or access information from people with other interests. The non-AES farmers have the lowest participatory rates in non-agricultural/environmental groups (n=1) and find them the least important.

Only two of the non-AES farmers actively participate in political/community groups compared to five in both the AES and HNVF groups. Fifty percent of the non-AES farmers participate in social/church groups compared to 38% of AES and 54% of the HNVF groups. Participants from this group have on average 3-5 close friends and have people they could turn to for help if they had a short or long term emergency term. Three of the farmers say they seek advice or discuss farming issues with other farmers on a weekly basis but for the others it is monthly or less. Advice seeking outside of the immediate network is rare but when it happens it tends to be with organisations such as Defra and the RPA. Participants often join these groups for personal gain or protection rather than social interaction e.g. farmers may have to be members of a breed association to sell livestock in certain markets or will join the NFU for protection and advice.

"I'm only in the mule association so I can sell my gimmer lambs and that's the only reason why and I don't go to no meetings or anything", (YDNP 1, AES).

Members of these groups can benefit socially and professionally from knowledge exchange and interaction with other farmers and advisors.

"The agricultural society show has made a lot of difference to my contacts within the farming community. It takes a great amount of time, it is a great way of integrating us, as we have recently moved into the area and come into the community", (NYM 9, Non-AES).

The strong ties of solidarity and levels of interaction between farmers in the non-AES group show access to high levels of bonding social capital which can help foster knowledge exchange, create lobby groups and give access to new markets and ideas. However low levels of interaction with people or groups outside of the farming sector, especially with non-agricultural and environmental groups indicate low levels of bridging social capital. This combined with low levels of linking social capital, which empowers individuals and gives them access to resources, may hinder the farmers in the non-AES when adapting to future agricultural policy change and a move towards a 'public money for public goods' approach to farming support.

5.2.2. AES category

Farmers in the AES category have a lower average agricultural/land-based group membership (1.8/farmer) that the non-AES (2.7/farmer) but they place the same level of importance on them as the non-AES group. Forty-two percent of the farmers in this category are members of non-agricultural/environmental groups compared to 1% of the non-AES and 85% of the HNVF group however, they do not rank these groups as important. On average, the farmers in this group state they have more than five close friends and that they have people they could turn to if they had short or long term emergencies. However, they would turn to family first with 50% of them stating they could not count on their neighbours. Four of the five farmers who participate in political/community groups are members of village councils, with one being in a parish council, and feel they are contributing to the community.

Table 2: Mean number of groups (total and important per farmer in each category and a summary of demographics in each of the groups and social capital type.

		Agricultural/land-based Groups			Non-agricultural/environmental groups			Political/community groups			Social/church groups		
	Farmer category	Total groups	Range	Important groups	Total groups	Range	Important groups	Total groups	Range	Important groups	Total groups	Range	Important groups
Mean number of groups per farmer in each category	Non-AES	n=27/2.7	0-5	1.1	n=1/0.1	0-1	0.0	n=4/0.4	0-3	0.2	n=6/0.6	0-1	0.2
	AES	n=24/1.8	0-5	1.1	n=9/0.7	0-3	0.1	n=5/0.4	0-1	0.3	n=8/0.6	0-2	0.3
	HNVF	n=17/1.3	0-4	0.5	n=21/1.6	0-5	0.7	n=12/0.9	0-3	0.3	n=15/1.2	0-4	0.3
Group demographics	Similar occupation	Yes			No			No			No		
	Same gender	No			No			No			No		
	Same age group	No			No			No			No		
	Similar education	No/not known			No			No			No		
	Locality of members	Mixed locations/local			Mixed locations			Mixed locations			Local		
	Familiarity with members	Familiar and new introductions			Familiar and new introductions			Familiar and new introductions			Familiar		
	Method of joining	Applied/invited			Invited/elected			Applied/word of mouth			Informal/invited		
	Membership Status	Stable to declining			Stable to increasing			Unsure			Unsure		
	Interaction with similar groups	Frequent			Frequent			Frequent			Frequent		
	Interaction with different groups	Rarely			Frequent			Frequent			Rarely		
	Group funding	Subscriptions/government			Government/self-funded			Subscription/self-funding			Self-funded		
	Group founder	Community leaders/government			Community leaders/government/NGO			Community leaders			Community leaders		
	Social capital type	Bonding			Bridging			Linking			Bonding/bridging		

"The main benefit that I think that I can bring is the fact that I'm a local, a lot of parish councils now are, not so much in Helmsley, but certainly in the different areas, through talking with different people, are filled with people from out of area", (NYM 11, AES).

Farmers in this group will exchange ideas and knowledge with other farmers on auction and market days but are unlikely to ring for advice. They occasionally ask advice from people outside of their network but this is mainly the vet or RPA when dealing with BPS. However, some farmers participating in results-based AES pilot schemes will engage with subject matter experts in their non-agricultural/environmental groups. They do this to seek advice on best practice and ways to enhance habitat condition, through which they will see AES payments increase. There are similar levels of participation in social/church groups as with the non-AES groups with farmers seeing benefits of having social interaction.

"The benefits of the farm watch group are that it stops your quad bike getting nicked and hanging out with local farmers, which is good, there's not a huge social life around here", (YDNP 12, AES).

Farmers in the AES group have similar levels of bonding social capital to those in the non-AES groups as demonstrated by their involvement in groups with people of a similar occupation and background and their preference to turn to family over neighbours. Some, especially those involved in a results-based AES pilot scheme, see the benefits of accessing bridging capital to gain new skills and knowledge which in turn helps increase farm income and viability. More farmers in this category access linking social capital through involvement in village and parish council than in the non-AES group and this enables access resources which can benefit the community. This ability to access building and linking social capital may make farmers in this group more adaptable to change as they have access to knowledge and resource from groups outside of the farming network.

5.2.3. HNVF category

The HNVF farmers had the highest group participation rate across the non-agricultural/environmental (1.6/farmer), political/community (0.9/farmer) and social/church group types (1.2/farmer) and lowest in the agricultural/land-based groups (1.3/farmer) when compared to the other group categories. HNVF farmers rate non-agricultural/environmental groups as being the most important as it gives them access to a very diverse range of groups which they access for information and advice. These include, Yorkshire Dales flood facilitation management group, River, Wildlife and National Trusts, RSPB, Fferm Ifan (a Welsh Sustainable Management Scheme cooperative) and a variety of other groups covering a range of environmental and conservation issues (see Table S1 for a detailed description of the nature of these groups). Whilst many of the agricultural/land-based groups provide functional benefits, i.e. access to markets, the non-agricultural/environmental provide group members with additional benefits as seen in these quotes:

"I hope that we can make a sustainable farming future for the whole area [by being in the River Trust]", (YDNP 9, AES).

"For Fferm Ifan, I believe we're unique in the way that we manage land together. I hope it's going to bring a lot of resilience to my community as much as my own business. I want the whole community to thrive to be honest", (NW 3, HNVF).

The majority of the farmers in this group say they have more than five close friends and all bar one say that they could count on their neighbours. They all have people they could turn to in a short or long term emergency and four gave examples of how people both in and out of the farming community have come to help following an illness or accident. They interact regularly with other farmers and talk with people in non-agricultural/environmental groups monthly. We found physical attendance in group activity to be higher in the non-agricultural/environmental and political/community groups than the agricultural/land-based

groups. Fifty percent of the farmers in this category are involved in political/community groups such as village councils and national park authorities and participate in social/church groups more than those in the AES and non-AES groups seeing the benefits of interactions with people outside of the farming community.

"Being in a choir is more, it's like being in a football team, socialise, get your head from talking about farming", (NW 1, HNVF).

Farmers in the HNVF have already adapted farming practice from a more conventional production focussed approach to public goods approach. They have lower levels of bonding social capital and higher levels of bridging social capital that those in the AES and non-AES groups and this is demonstrated by the high levels of interaction with groups of people with different interests than farming. They access higher levels of linking social which gives them access to knowledge and resources which assists them in adapting to change. The results for group participation explore the types and structure of groups and how different types of social capital are accessed through groups. Trust and solidarity and how individuals interact with other people in the community also significantly impacts on the ability to access to social capital.

5.3. Trust and solidarity

Trust is an important factor for strengthening social capital (Fisher, 2013). Trust enables people to mobilise bridging and linking social capital and facilitate collective action which can give access to the knowledge and resources required to facilitate change (Hatak et al., 2016). Here we present data on trust towards neighbours, government officials, and strangers, and explore how individuals interact within the community and how perceptions of community have changed over time. Most participants in all three farmer categories agree, at least somewhat, that people within the community can be trusted and are willing to help (Table 3). However, further exploration identified differences between the groups in perceptions of

community. The non-AES and AES categories perceive the local community as split between the farming and other community, with the 'other' community containing non-farmers and 'incomers'. There is a perception that rural community life, especially within national parks, is changing for the worse and that change is predominantly driven by incomers, "If you had asked this 20 years ago [level of trust], I would have said 90% but now with people moving into the village I would say I would trust people in the village 10% but farmers and family, yeah I would trust most of them", (NYM 12, AES). A perceived lack of knowledge and a disregard for the ways of the country erodes trust between the farmer and the incomer. Many incomers are retirees or have holiday homes so are not seen as being able to help. This is exemplified by the statement "Most are not in a position to help. The people that are here don't need to be here and spend their time going somewhere else. Holiday homes, people who have made a lot of money or are retired, solicitors, doctors and people like that" (NYM 1, AES). They are seen to be bringing 'city' ways into the countryside for example, loud music, dogs and changes which divide and change the community, "They divide. Incomers like to divide; they like to do their own thing, so locals don't get involved. They had a band concert the other night, dogs were all stressed up because all this music is going and they wonder what's going on", (YDNP 2, AES). There are high levels of trust within the immediate family and farming community but low levels of trust of incomers can also extend to farmers outside of the immediate community, "All the ones I trust, I talk to them, the ones what I don't trust, I just say "hello, it's a nice day" but I don't talk about farming because if they know what you have, they could go and pinch it" (YDNP 11, non-AES).

In contrast, within the HNVF group levels of trust are higher with the majority not seeing incomers as an issue, "There is a divide, but I don't adhere to it. In personal terms, I would disagree with that", (YDNP 7, HNVF). However, like the non-AES/AES groups there are some who see divide in the wider community and trust only the farming community, "Within the

farming community locally, nobody would take advantage of you. A lot of the families within the farming community here are 2nd and 3rd generation. The other community. If you have a dead sheep they will be ringing up, they wouldn't ring you, they would ring trading standards", (NYM 2, HNVF). There is no significant difference in perceptions of local and central government between the groups. Farmers in the non-AES group have low-medium levels of trust in local government compared to low-high in the AES and HNVF groups. However, this changes for central government where the AES group have low-medium levels of trust compared to low-high in the non-AES and HNVF groups. Negative opinions are shaped through either personal experience, "We have a completely useless MP, he just behaves like a postman, you go to see him and he takes some notes and says he will do things and you never hear from him again" (NYM 14, HNVF) or a lack of interaction with government officials, "I don't have direct contact with local government officials so it can't be a very big figure [level of trust]", (NYM 16, AES).

Levels of trust and solidarity within a community are what create community cohesion and increase the ability to access the social capital needed to adapt to change. Here we show farmers in the non-AES and AES groups demonstrating lower levels of trust in non-farmers and incomers than those in the HNVF group. They feel the community is divided, there is no social cohesion and some feel they need to be alert and aware of others in the community. This along with high levels of trust in the farming community indicates high levels of bonding social capital and lower levels of bridging social capital. In contrast, the HNVF groups do not see a divide and do not feel the need to be alert. They have higher levels of trust in non-farmers and incomers and see the benefits of interaction with people in these groups. This indicates that the HNVF group have higher levels of bridging social capital than those in the other groups. As agricultural and environmental policy moves towards a SLM approach to land management

cooperation and collective action, gained though accessing bridging and linking social capital, will potentially be a valuable asset to those adapting to change.

5.4. Collective action and cooperation

Farmers in the HNVF group are more likely to contribute both time and money to community projects that do not have a direct benefit to themselves than those in the non-AES/AES groups. A lack of time to contribute to projects is a theme running across all groups but in the non-AES/AES groups, community divide and a lack of trust in incomers creates a barrier to both time and financial contributions as shown here, "It didn't benefit me at all and not the agricultural community? It's only a small village. I knew everyone but now I doubt if I know a quarter of them. So, why should I contribute to something that's not going to benefit me directly?" (NYM 6, AES). Collective action and cooperation can only happen if there is trust and social cohesion. The perceptions of community divide seen in the non-AES and AES groups is also reflected here where we see a willingness to contribute time and money to projects which benefit the wider community lower than in the HNVF group. Again indicating high bonding social capital in the non-AES and AES groups and high bridging social capital levels in the HNVF group.

Table 3: Participant perceptions of community, the levels of trust felt towards different groups within the community and the willingness to contribute time and money to community projects.

Category	People willing to help	Need to be alert	Community divide	Community	Local government	Central government	Farmers	Non-farmers	Incomers	Contribute to community (Money)	Contribute to community (Time)
Non-AES	Yes	Divided	Yes	High	Low to medium	Low to high	High	Medium to high	Low to high	Even split Yes/No	Even split Yes/No
AES	Yes	Divided	Yes	High	Low to high	Low to medium	High	Low to high	Low to medium	Majority No	Even split Yes/No
HNVF	Yes	No	No	High	Low to high	Low to high	High	High	Medium to high	Majority Yes	Majority Yes

5.5. Information and communication

Participants were asked to identify three sources they utilise to access information on government policies and actions and three sources they utilise to gather information on markets and to assist with decision making on the farm. The small sample size makes it difficult to identify significant differences between the categories of farmer in the ways in which they access information. All three categories utilise a wide range of sources to give them information on both the government and the markets. Here we discuss how the groups communicate with other people and how they use media sources to access information.

5.5.1. Communication

Bonding social capital is accessed by all three farmer categories to gain information on what the government is doing and for information to help with decision-making. Matriarchal/patriarchal figures are often accessed first for information, "Advice from my father would be number one. Then talking to friends would be number two", (NW8, HNVF). The strong relationships formed with other farmers, friends and neighbours are also a source of bonding social capital that can be accessed for information and often these three things merge, "Relatives friends and neighbours and other farmers which are all interlinked", (NYM 4, Non-AES). Markets provide a place for people from different locations, but the same background, to meet and exchange knowledge and ideas on both markets and what the government is doing. However, discussion groups with other farmers, "I quite like having discussion group meetings because you always seem to bring something away from it", (YDNP 14, Non-AES) and social interactions, "I make a point of talking to people, I always have done, on Monday I sat down with the local farmers over lunch just talking about what is happening", (NYM 9, Non-AES) are also important ways of accessing bonding social capital.

Bridging social capital is accessed through communication with others outside of the farming community and this is demonstrated here by two of the HNVF category, "I would say

conversations but not necessarily with farmers, unlikely to be with farmers, so more with conversations with bodies such as the Parks Trust and environmental NGOs", (YDNP 7, HNVF); "We had a scything event here. We put a talk on and there's a very good local cheese shop here and he supports a lot of small cheese producers, we invite him here and then they go and get a talk on micro-dairies (YDNP 6, HNVF). Communication is one way of accessing information the other is through media.

5.5.2. *Information*

Traditional media sources; TV, radio, national newspapers and magazines are used by farmers in all categories to access information on what the government is doing. These sources are also used for access to market information but through specific sources e.g. radio, "We listen to the radio, listening to farming in the morning", (YDNP 9, AES) or the farming press, "I look at Welsh Government mailboxes whenever they send circulars, again with Hybu Cig Cymru (Welsh Meat Production). It's usually Farmer's Guardian, to see what's going on", (NW 5, Non-AES). All three farmer categories access the internet and see benefits in doing so. It is used to access information on the markets, "My father used to have time to go to the auctions every week but I don't have time so before we go to sales I check the prices at the local auctions", (YDNP 2, AES); to get up to date, trustworthy information, "You kind of trust it and it is up to date. The problem with the farming press is that when you read it it's already out of date", (YDNP 3, non-AES); to gain access to a wider information base, "It opens up more doors; scientific papers, veterinary papers", (NW 5, non-AES) and to reduce isolation, "If you can't get away anywhere, you can talk to them online. We can be stuck in for a week sometimes (YDNP 11, non-AES). The internet gives farmers, often isolated for long periods of time, access to their immediate networks (bonding social capital) and to wider networks (bridging social capital). There were however, two farmers in the AES category who say they never access the internet, "I don't watch TV and I don't go on the internet cause, I don't have

time", (NYM 1, AES). Interestingly both of these farmers also say they either don't have or do not watch TV. This shows strong bonding social capital which can have an impact on social cohesion and inclusion.

5.6. Social cohesion and inclusion

If farmers are to reduce farm inputs and GHG emissions they may be required to share machinery and cooperate and share resources with neighbouring farmers and others in the community (Clark and Scanlon, 2019). Therefore, social cohesion and the way people interact within the community is important. However, "communities" are not single entities, but rather are characterized by various forms of division and difference that can lead to conflict (Grootaert et al., 2004). Here we seek to identify where divisions and conflict occur. We find farmers in all three groups stating that differences between people negatively impact upon the community to varying degrees. However, the HNVF group showed higher levels of bridging social capital than the AES/Non-AES groups. Twenty-three percent of the HNVF did not feel that differences between people impacted upon community life whereas all the non-AES/AES groups indicate that it caused a negative impact. In the non-AES/AES groups, ~65% believed that these differences caused problems compared to ~65% of the HNVF group who did not. Cultural differences between incomers and long-standing members of the community provide the main source of conflict. A perceived lack understanding of countryside and rural culture amongst those moving into the area from more urban locations creates problems, "The people who come into the district are not Yorkshire and they don't know what Yorkshire's like. They think they can behave as if it was the same as where they've been, and they often can't", (NYM 16, AES). These perceptions drive divisions between groups with differing interests. The incomer view of country life often differs from that of the farmer, leading to complaints and objections, "I think that the incomers don't understand about the countryside, don't necessarily want to learn about it, they object to some of the things which they see happening like fox hunting or pheasant

shooting", (NYM 16, AES). However, farmers also have complaints about the incomers, "Incomers who have the dogs think, we're in the country now, I can let my dog loose. Somebody who'd been born and bred here wouldn't turn his dog loose because he knows he's going to chase sheep", (NW 6, AES).

Wealth, often linked to incomers, also creates division. People coming into rural locations are usually financially self-sufficient often coming to the country to retire or to buy second homes. People are prepared to pay for the well-being effects of cultural ecosystem services such as clean air and water, aesthetics and recreation and this in turn drives up property prices to the point where the local populace often feels excluded, "This is a very popular area for retired people and that pushes the prices of property way beyond the levels that young people can afford. None of them are here anymore", (YDNP 8, HNVF). Changes to the farming community, namely larger farms and less farm workers often causes isolation and leads to non-deliberate causes of division, "They [changes] impact upon me, lack of soulmates, lack of people to talk to, different attitudes. I get on okay with people, but I find I'm not on the same wavelength in terms of attitudes and stuff. I would like to feel closer to people but if they don't think the same way as you well that's life, (NYM 4, non-AES). Some see differences between people as positive, "I don't think that those differences cause a great deal of issue in the community. I almost think it's a positive thing, to be honest. I think in the village people who have moved in have contributed to making the village a better place", (YDNP 7, HNVF) whilst others acknowledge that cultural barriers exist within the farming community, "The farming community has a no change approach to life, they are worried about change. This is what my father did, my grandfather did, my great grandfather did. why should we change?", (YDNP 5, HNVF). The strong bonding capital shown here can be beneficial to those within the farming community. Farmers who connect to one another, create shared goals and a sense of unity and

can empower the community and build their collective efficacy to address issues that affect their communities (Collins et al., 2014).

5.7. Empowerment and political action

Individuals are "empowered" to the extent they have a measure of control over institutions and processes directly affecting their well-being (World Bank, 2002). In this section we explore how participants react to proposed political change and what actions they have taken to influence and adapt to change. Participants across all groups stated they voted in the latest UK general election, and all non-AES and HNVF participants and 83% of the AES group voted in the EU referendum. 75% of the HNVF group attended government-led consultation meetings or completed a consultation paper on the future of farming post-Brexit compared to 30% of the AES group and 20% of the non-AES group. Across all groups there are some who think Brexit will have a significant impact on their business, some who think it will have a slight impact and some who think it will have no impact. For example, within the AES group there were two participants who do not believe there will be any significant changes to the payments system and are not really thinking about it, "I've not thought about it, you just bury your head in sand don't you really", (YDNP 13, AES). Most participants, across all groups, recognise that change is inevitable, and many are adapting farming practices or considering options for change in the future. Of those non-AES participants considering changes, only one is considering diversifying into environmental goods. Others are considering changes to production practices and breeds, reducing input costs and off-farm diversification. In the AES group, two are considering making efficiency changes whilst the remainder are either waiting to see what comes, ignoring the fact that change is inevitable or preparing to leave farming if things get economically unviable. The majority believe that they currently farm in a way that will attract environmental payments and some are considering moving further down that route by further

reducing stock and embracing more options to deliver public goods and changing farming practice to become more efficient.

3. Discussion

"Social capital" refers to features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit (Putnam, 2000). Conventional wisdom says that social capital is stronger amongst rural communities than urban communities due to perceived strong interpersonal relationships and mutual obligations (Hofferth and Iceland, 1998). However, communities, which are notoriously vague and troublesome to define (Dinnie and Fischer, 2019), are dynamic with an ever changing flow-through of people, money and ideas (Callaghan and Colton, 2008) and these changes have the potential to impact upon levels of social capital within the community. Change, as we show here, is occurring in both the farming and wider rural community. According to recent estimates, the population of rural areas is growing faster than urban areas with growth occurring fastest in less sparse villages and hamlets (Commission for Rural Communities, 2011). Urban to rural migrants, normally aged 45-74 (Commission for Rural Communities, 2011), move to the countryside for business reasons, to retire or to chase the 'Rural Idyll', which views the countryside as an idealized, romanticized construct that presents rural areas as happier and healthier, with more neighbourly communities and fewer problems than urban areas (Osbaldiston, 2009; Rogers et al., 2013; Gaspar, 2015; Stockdale, 2016). As we demonstrate, many of the old structures of rural communities e.g. the village council and the local agricultural shows are well supported however, the participants are not just locals with generational ties to the community. They are now joined by the professional home-worker, the office-worker/commuter and the retired bank manager who bring different cultural and social ideals (Rogers, 1989; Burton et al., 2005). The role of farmers and farm workers within the social structure of the community has significantly changed due to these demographic and

social changes. The farmer still has social standing but they find themselves alongside the retired professional or commuter on the parish of village committee (Rogers, 1989). These changes are exaggerated further by changes to farming community structures which have driven a decline in the levels of social capital generated through the communal sharing of tasks within the local community due, in part, to the farmer having less time to interact with other members in the community (Burton et al., 2005).

Decreasing income and the severe pressure to respond to a changing economic, social, political, technological and natural environment has led to a reduction in the number and an increase in the size of agricultural holdings across Europe (European Commission, 2013) affecting farm businesses and the life of farming families (Alsos et al., 2011). Economic divide has existed in rural communities since Victorian times. However, the influx of incomers with a higher than average income potentially sees the rich minority become the majority and the economic divide between the minority and majority increase (Roger, 1989). The degree at which intermixing or polarisation between incomers and established members of the community will very much depend on both the nature and intensity of the rural idyll imported by the incomer and the degree to which individuals within the locality cling to cultural heritage (Cloke and Milbourne, 1992). As farmers' roles in local communities diminish, the co-operative action between them, and between them and local villages, is likely to diminish and with it their social capital generated (Burton et al., 2005). Here we show that structural and demographic changes to the wider communities in which our farmers live, have led to an erosion in communication levels between farmers, especially the non-AES and AES groups, and the community outside of their immediate network. A lack of polarisation between the incomer and the farmer can increase the importance of the markets, auctions and agricultural groups to which the farmer belongs. Farmers come together to compare practices, catch up and gossip and exchange complaints, they can reassure themselves that they are doing things right

(Hills, 1988) increasing bonding social capital and potentially creating barriers which may make it more difficult to adapt to change. We demonstrate this occurring within the study communities by showing that a primary reason for an erosion of trust between the farmer and the incomer is perceptions that 'incomers' have a perceived lack of knowledge and a disregard for the ways of the country. This is especially prevalent in the non-AES and AES communities where participation in agricultural groups and social events is highest. Levels of trust are high within the inner circle of family and friends but much lower when that circle is extended to the wider community or even to other farmers. These groups are also those most likely to think that divisions within the community cause problems and this also impacts upon levels of trust. Within the non-AES and AES groups an inward-looking view of community, and a lack of trust in those out-with the immediate family/friendship network, supports the view that levels of bonding capital are higher in these groups than bridging capital. However, the importance of these networks and the role of knowledge cultures (Morris, 2006) in the development of more environmentally sustainable farming systems is not to be underestimated.

In recent years the UK, and other European countries have seen the CAP progressively become 'greener'. Science has been called upon to assess the environmental damage caused by production-based agriculture and policy has changed to identify more sustainable pathways of development, most notably in the form of AES (Riley, 2008). The policy knowledge culture of prescriptive AES casts farmers and land managers as lacking the necessary knowledge about how to manage their land appropriately and therefore dictates how management practices should be implemented (Morris, 2006). However, the intimate and experiential knowledge of how the natural environment 'behaves' in the particular circumstances of the farm often sees farmers contest scheme prescriptions and challenge the policy knowledge culture (Morris, 2006). The 'one size fits all" (Mettepenningen et al., 2013) nature of prescriptive AES leave little flexibility (de Krom, 2017) preventing farmers from utilising generations of local

knowledge and this tends to create barriers between the scientists/policymakers and the farmer (Riley, 2008). If policymakers are to increase participation in AES and encourage farmers to adopt ELMS they must pay attention to the complex and deeply socialised understandings and knowledge cultures of farmers in order to understand how they may play a role in the countryside managements of the future (Riley, 2008).

The HNVF group view differences in the community as less problematic and have higher levels of trust of those outside of their immediate network than those in the non-AES and AES groups. They have the most diverse range of groups with membership of agricultural groups being the lowest and membership of non-agricultural and political groups being higher than both the AES and non-AES groups indication high levels of bridging and linking capital (Cofré-Bravo et al., 2019). This interaction with people and groups outside of the immediate farming network allows for greater access to research-based knowledge, innovative experiences, and training and financial resources (Adler and Kwon, 2002; Mills et al., 2008). This may open opportunities for diversifying forms of production and business models not available to the AES and non-AES groups. Participants in the HNVF group demonstrate higher levels of linking capital than the other groups through their participation in political groups and membership of National Park boards. These high levels of linking social capital enable the HNVF participants to engage vertically with external agencies, giving them the ability either to influence their policies or to draw on useful resources (Pretty and Smith, 2004). In contrast, the lack of trust and relationships with government bodies in the more conventional farming groups means that levels of linking social capital between farmers and government representatives are limited and this may limit access to funding and training opportunities (Mills et al., 2008).

A UK exit from the EU will mean change for farmers but for some their ability to change may be hindered by social capital levels in the immediate and wider community, whereas for

others social capital will enhance their ability to adapt (Woolcock, 1998). Here we have shown that farmers in the non-AES and AES groups have higher levels of bonding capital and lower levels of bridging and linking capital that those in the HNVF group. Social capital, especially bridging and linking capital, is essential for maintaining and enhancing public goods whose value can be maintained only through co-operation and trust, and whose value is lost through the pursuit of individual self-interest (Wilson, 1997). Hall and Pretty (2008) found farmers with sustainable farms had success-based identities and stronger feelings of self-efficacy about their interaction with government agency staff. Farmers with high bridging and linking social capital tend to have better social skills, higher self-esteem and self-efficacy which enables them to overcome frustrations when dealing with government agencies and other organisations (Cast and Burke, 2002; Hall and Pretty, 2008). In contrast, strong bonding capital, seen in the non-AES and AES groups, builds social capital links based on mistrust and a desire to protect the group from the outside (Wilson, 1997). This potentially disempowers the farmer making them feel strongly averse to contact with government agency staff (Hall and Pretty, 2008).

In this study we have shown the HNVF group to have high levels of bridging and linking social capital. This has enabled and supported a transition from a conventional production approach to farming to a more extensive, nature friendly farming approach delivering 'public goods' and has potentially placed them in a better position to access the knowledge and resources needed to adapt to future policy. If more conventional farmers with high bonding and low bridging and linking social capital are to effectively build the social capital required to ensure the viability of rural communities, the government must shift from acting as controller, regulator, and provider to new roles as catalyst, convener, and facilitator (Potapchuk et al., 1998). They must encourage differing dimensions of the rural community to cooperate and forge better relationships for the benefit of all. A local advisory service, staffed by people with good understanding of local conditions and the ability to use integrated knowledge to see the

farm business as a whole, will increase social capital by improving dialogue and understanding between farmers and other stakeholders (Mansfield, 2019). Improved relationships with stakeholders who have a vested interest in rural communities will ensure not only the production of high-quality sustainable food, but a range of public goods and services of which the whole of society benefits (Mansfield, 2019). If local farmers and community members can overcome communication barriers and work together as partners to create a sustainable local food system it has the potential to increase the whole community's vitality and sustainability (Brehm and Eisenhauer, 2008).

5. Conclusion

In this study we have shown how social and demographic change has impacted upon farming communities. As farmers' roles in local communities diminish, the co-operative action between them, and between them and local villages, is likely to diminish and with it their social capital. We show farmers in the non-AES and AES groups demonstrating high levels of bonding capital which brings them together as a farming community but creates barriers to interaction with people and groups outside of the immediate network. The high levels of bonding social capital, created by divisions in the community, has the potential to create barriers to policy adoption through an inward looking perspective which is resistant to change. In contrast, farmers in the HNVF group have high bridging capital and an outward-looking approach to relationships and networking. They are already adapting to change, engaging with a wide variety of networks and embracing the public goods approach to land management that is likely to increase the likelihood of the farmstead remaining viable post-Brexit. If more conventional farmers are to build the social capital they need to adapt to forthcoming change they will need government support, through training, mentoring and facilitation, to help introduce and manage new relationships and to provide the knowledge and advice required to remain viable in the face of change.

Conflict of interest

The authors confirm that there is no conflict of interest with the networks, organisations, and data centres referred to in the paper.

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Supplementary Information

Table S1: Description of the main environment groups that participants in the non-agricultural category hold memberships.

Group	Description	Link

Yorkshire Dales National Park Pilot Scheme	A total of 19 farmers have entered bits of land into a “Results-Based Agricultural Payment Scheme”. They are being paid according to results, which means there are no prescriptions to follow on cutting dates. The principle is straightforward: the more species-rich the meadow, the higher the payment to the farmer. ‘Payment by results’ – Refers to publicly-funded schemes that reward farmers for achieving environmental improvements, rather than for following detailed sets of rules and regulations.	https://www.yorkshiredales.org.uk/about/national-park-management-plan/c-wildlife/objective-c4/
Yorkshire Dales flood facilitation management group	In 2018/19, there were five Natural Flood Management Facilitation Fund projects running across the National Park, working with groups of farmers to identify opportunities to introduce natural flood management measures.	https://www.yorkshiredales.org.uk/about/national-park-management-plan/d-climate-change/objective-d5/
The Rivers Trust	The Rivers Trust is the umbrella organisation for 60 local member Trusts, they are the only group of environmental charities in the UK and Ireland, dedicated to protecting and improving river environments for the benefit of people and wildlife.	https://www.theriverstrust.org/who-we-are/about-us/
The Wildlife Trusts	The Wildlife Trusts is a grassroots movement of people from a wide range of backgrounds and all walks of life, who believe that we need nature and nature needs us. They have more than 850,000 members, 38,000 volunteers, 2,000 staff and 600 trustees.	https://www.wildlifetrusts.org/about-us
The National Trust	Europe’s largest conservation charity, they look after nature, beauty and history for the nation to enjoy. Thanks to the millions of members, volunteers and staff that support them they be able to care for the miles of coastline, woodlands, countryside and the hundreds of historic buildings, gardens and precious collections under their protection.	https://www.nationaltrust.org.uk/features/about-the-national-trust
The RSPB	The largest nature conservation charity in the UK, consistently delivering successful conservation, forging powerful new partnerships with other organisations and inspiring others to stand up and give nature the home it deserves.	https://www.rspb.org.uk/about-the-rspb/

Fferm Ifan	Fferm Ifan is a group of 11 tenant farmers based on the Ysbyty Ifan estate. The farmers have grazing rights to the Migneint, one of the largest areas of blanket bog in Wales, which is designated as a Site of Special Scientific Interest, Special Area of Conservation and Special Protection Area. The group are working on a landscape scale scheme to manage natural resources more sustainably and effectively, funded by the Welsh Government's Sustainable Management Scheme (SMS).	https://www.nationaltrust.org.uk/features/fferm-ifan

S1. An example of the questionnaire used during farmer interviews

Identifying social capital types between farmer groups

Interview number–

Introduction

1. Introduce interviewer, explain research project and aim of interview.

2. Ask for permission to record interview.

3. Explain data protection and anonymity.

4. Explain what will happen with results of interviews.

Demographics

a) Farm type:

b) Farm Size:

c) Gender:

d) Age:

e) Type of AES: Can you tell me about any AES that you are involved with? HNVF group:

Can you tell me what you do above and beyond that required of an AES?

f) Diversification: Can you tell me about any diversification activities that you are involved in?

Network and social capital

Groups

1) I would like to start by asking you about the groups or organisations, networks, associations, outside of family networks, to which you belong. These could be formally organised groups e.g. Farmers groups, union, traders' association, production cooperatives or machine rings or informal groups who get together regularly to do an activity or talk about things. E.g., village committee, sports group, club, informal cooperatives.

Can you tell me about the groups you belong to, how many and the type?

2) Of the groups to which you belong which two, are the most important and why?

3) Can you tell me about your involvement with the groups e.g. how many times a year do you participate in group activity?

4) Can you tell me how you became a member of these groups?

5) What do you think are the main benefit of being in these groups?

6) Can you tell me about the other members of the groups e.g. are they from a similar occupation or educational background as you?

7) Can you tell me about membership levels in the groups e.g. is membership in the group declining (a), remaining the same (b), or increasing (c) and why you think this may be the case?

8) Can you tell me about your groups interactions with other groups with similar goals e.g. how often and when?

9) Can you tell me about your groups interaction with other groups with different goals?

10) How are your groups funded?

11) Can you tell me who originally founded the group?

Networks

12) Can you tell me about your immediate network e.g. how many close friends do you have? (These are people you feel at ease with, can talk to about private matters, or call for help).

13) If you suddenly needed help to see you through a short-term emergency e.g. delay in BPS, AES payments, are there people beyond your immediate household and close relatives to whom you could turn to? (ask for an example).

14) How do you get on with your neighbours? If you suddenly had to go away for a day or two, could you count on them to take care of your farm?

15) If you suddenly faced a long-term emergency such as an injury or a harvest failure/BSE crisis, how many people beyond your immediate household could you turn to who would be willing to assist you? (Can they provide an example).

Trust and solidarity

In every community, some people get along with others and trust each other, while other people do not. Now, I would like to talk to you about trust and solidarity.

16) Generally speaking, would you say that most people in your community can be trusted or that you can't be too careful in dealing with people? (Ask participant to expand upon the answer)

17) In general, do you agree or disagree with the following statements?

1 = agree strongly, 2 = agree somewhat, 3 = neither agree or disagree, 4 = disagree somewhat, 5 = disagree strongly.

1. Most people in this community are willing to help if you need it:

2. In this community you have to be alert or someone will take advantage of you:

Ask participant to explain the responses using examples

18) How much do you trust?

1. Local government officials:

2. Central government officials:

Ask participant to explain the responses using examples

19) If a community project does not directly benefit you but has benefits for many others in the community, would you contribute time or money to the project?

1. Time:

2. Money:

Ask participant to explain the responses using examples

Collective action and cooperation

20) In the last 12 months, have you participated in any communal activity where people came together to do some work for the benefit of the community?

Can you give me an example of when or tell me why this has not happened?

How many times in the last 12 months have you participated in communal activity?

21) If there was a problem affecting the whole community, how likely is it that people will cooperate to help solve the problem?

Can you give me an example of when this has happened or tell me why people will not cooperate?

Information and communication

22) What are your three main sources of information about what the government is doing (such as Brexit, subsidies, policy change, etc)?

23) What are the three most important sources of market information (such as jobs, process of livestock or crops)? How often do you access the internet?

24) How has access to the internet impacted upon your business?

Social cohesion and inclusion

27) There are often differences between people living and working in the same community. For example, differences in wealth, income, social status, land-use, access to land, age or sex. Can you tell me how differences between people impact upon your community?

28) Do any of these differences cause problems and if so which differences cause the most problems?

30) How many times in the past month have you got together with people to have food or drinks, either in their home or in a public place?

Can you tell me a bit about the people you met with e.g are they from a different occupation of social status than you?

31) In general, how safe from crime and violence do you feel when you are at home and why?

Empowerment and political action

33) In general, how happy do you consider yourself to be?

34) Do you feel you have the power to make important decisions that change the course of your life?

Ask respondent to expand upon the answer

35) In the past 12 months have you, individually, or as part of your community, petitioned the government or completed a consultation paper that may lead to benefits for the community?

If yes, ask participant to give an example

36) Did you vote in the EU referendum?

37) Did you vote in the last general election?

Additional questions

38) (Nature friendly farming group) - What were your main motivating factors to farm in a nature friendly way?

39) (AES group) – What were your main motivating factors to join an AES?

41) (Non-AESgroup) What are the main barriers preventing you from joining an AES?

42) On a scale of 1 – 4, do you think Brexit and changes to the payment scheme will impact your business? 1 = Significantly, 2 = slightly, 3 = unsure and 4 = not at all doesn't apply to me.

43) How will you change your business practices to cope with future challenges arising from Brexit?

44) What are the pros/cons to working with other people/groups within and outside of your immediate network?

45) Would you be prepared to increase the number and type of people e.g. voluntary sector organisations, farm advisors, researchers, etc in your social network to increase farm viability?

46) If yes, what do you think the benefits of doing so would be.

47) If no, what are the disadvantages of doing so?

That brings the interview to an end, thank you for your time

SI 2, The World Bank six dimensions of social capital

Groups and Networks. This is the category most commonly associated with social capital. The questions here consider the nature and extent of a household member's participation in various types of social organizations and informal networks, and the range of contributions that one gives and receives from them. It also considers the diversity of a given group's membership, how its leadership is selected, and how one's involvement has changed over time.

Trust and Solidarity. In addition to the canonical trust question asked in a remarkable number of cross-national surveys, this category seeks to procure data on trust towards neighbors, key service providers, and strangers, and how these perceptions have changed over time.

Collective Action and Cooperation. This category explores whether and how householdmembers have worked with others in their community on joint projects and/or in response to acrisis. It also considers the consequences of violating community expectations regarding participation.

Information and Communication. Access to information is being increasingly recognized as central to helping poor communities have a stronger voice in matters affecting their well-being. This category of questions explores the ways and means by which poor households receive information regarding market conditions and public services, and the extentf their access to communications infrastructure.

Social Cohesion and Inclusion. "Communities" are not single entities, but rather are characterized by various forms of division and difference that can lead to conflict. Questions in this category seek to identify the nature and extent of these differences, the mechanisms by which they are managed, and which groups are excluded from key public services. Questions pertaining to everyday forms of social interaction are also considered.

Empowerment and Political Action. Individuals are “empowered” to the extent they have a measure of control over institutions and processes directly affecting their well-being. The questions in this section explore household members’ sense of happiness, personalefficacy, and capacity to influence both local events and broader political outcomes.

Agricultural/land-based Groups

- Breed associations,
- National Farmers Unions (NFU's),
- Farmer networks,
- Grazing associations,
- Trade support groups and
- young farmers groups

Non-agricultural /environmental groups

- RSPB,
- Wildlife and National Trust,
- Renewable energy group,
- Flood facilitation management group,
- Sustainable Management Schemes (National parks)

Political/community groups

- Global Justice Now,
- The Labour Party,
- The Country Land and Business Association,
- National Park Authorities,
- Parish and village councils,

Social/church groups

- Rugby/football clubs,
- Cycling/walking groups
- Bowling groups,
- Church groups,
- Shooting syndicate/hunt group
- Book club

Figure SI. Categories of farmer social groups with examples of group type for each category.