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Towards a better measurement of the social sustainability of Irish agriculture

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Abstract.

There exists a need to analyse and develop the social aspects of agricultural sustainability. Distinct gaps between agricultural policy priorities and the data infrastructure needed to develop metrics for policy evaluation at the farm level exist, particularly regarding the social dimension of sustainability. This paper aims to examine the current social sustainability frameworks in operation across Europe and beyond, with a view towards expansion using Irish Farm Accountancy Data Network (FADN) data from the Teagasc National Farm Survey. A stakeholder consultation process, featuring policymakers, farm data recorders, academic researchers amongst others, highlighted pertinent concerns regarding the social sustainability of agriculture. Issues such as farmer stress, work/life balance, generational renewal and the viability of rural areas featured as priority concerns. Issues such as these have been identified as key areas of concern within the new Common Agricultural Policy which supports the continued development of specific indicators of social sustainability.

Keywords: Agricultural sustainability; sustainability indicators; stakeholder consultation; farmer wellbeing; rural viability; generational renewal; rural isolation; social sustainability, sustainable development; mixed methods research

1. Introduction

There is a growing narrative that the global food system is flawed. Issues such as the impact of food production on the environment, animal welfare, global food security, value sharing along the supply chain, and food waste are now in common parlance (Wheeler and Von Braun, 2013, Lang and Barling, 2012). In response to these concerns, consumers are turning to more

sustainable diets and are as such demanding better information on the sustainability status of farming and food production (Garnett et al., 2013).

Sustainability has been a core focus of global and national policies for some time, originating from the Brundtland Commission in 1987. The term remains notoriously difficult to define with over seventy different definitions in use (Diazabakana et al., 2014). Nonetheless, there is general agreement that sustainability encompasses three main pillars; economic, social and environmental and progress has been made in terms of measurement (Van Calster et al., 2005, Dillon et al., 2016). The United Nations (UN) Sustainable Development Goals put sustainable global development to the forefront, with nine of the seventeen goals directly or indirectly connected with agriculture (Euractiv, 2016, Knickel et al., 2018). Within the European Union (EU), sustainability is a central tenet of the Common Agricultural Policy (CAP) and rural development policy generally (European Commission, 2017a). Minimising the negative impact of agriculture on the environment is a key objective of the CAP as reflected in cross compliance and greening policies, whilst the multifunctional nature of farming and the social and cultural contribution of farmers to rural areas is also acknowledged.

In response to consumers' growing demand to understand more about the sustainability of food production (Kirwan et al., 2017) and policy makers' desire for additional data to monitor and evaluate sustainability policies, there has been a proliferation of research measuring agricultural sustainability. Through the use of indicators, agricultural sustainability has been assessed through a series of economic, environmental and social metrics developed at the farm level and more recently across the food supply chain (Marsden and Smith, 2005, Yakovleva, 2007). However, the main emphasis of these assessments has primarily been on addressing biophysical issues in the environment with other aspects of sustainability being relatively more neglected (Janker et al., 2019). Vallance et al. (2011) discuss how social measurement of sustainable development has often been amalgamated within the discourse of economic

development. As a result, the analysis of social sustainability has received less attention than that of economic and environmental dimensions (Gaviglio et al., 2017, Kelly et al., 2015).

In this paper we argue the need for improved social sustainability measurement for agriculture, and focus in particular at the farm level in Ireland. For centuries, agriculture has occupied a central tenet within the Irish economy, and it is inextricably woven into the fabric of Irish rural life. Like their European counterparts, modern Irish farmers now face new and contemporary challenges towards their livelihoods, in areas such as climate change, energy costs and rural depopulation (European Commission, 2019). It is imperative therefore that sustainability measures are developed to address evolving challenges impacting the agricultural sector.

A public consultation regarding the modernisation and simplification of the CAP post- 2020 was undertaken in 2016 (European Commission, 2017a). This process highlighted public interest in matters regarding socio-economic development in rural regions, namely rural employment, tourism, farm multifunctionality and cultural heritage. The assessment of animal welfare and protection was also highlighted as a pertinent social issue requiring measurement, and additional topics suggested by the participants included measures to assess consumer awareness regarding food policy issues, quality control on agri-food products, subsidy support for younger farmers and the promotion of generational renewal. A 2018 report reviewing the sustainability of the Irish agri-food sector identified generational renewal as a key socio-economic challenge for European farming, (Joint Committee on Agriculture, 2018), with only 6% of EU farm holders aged 35 years or younger (Department of Agriculture, 2018)

The CAP post 2020 will potentially direct more support toward the public goods produced by farmers, such as their contribution to biodiversity and the viability of rural areas (often bereft of other economic activity), as well as the protection of culture and heritage (Hennessy et al., 2018) and as such verifiable measures of the social impacts of food production are required.

Following an extensive literature review, we present a framework to measure social sustainability at the farm level in Ireland and test this framework using a mixed methods approach including a series of in-depth interviews with key stakeholders.

2. Background

In its broadest sense, social sustainability relates to people, and has been defined by Black (2004) as *‘the extent to which social values, social identities, social relationships and social institutions can continue into the future’*. The emphasis of many sustainability assessments over the past two decades has primarily been on environmental considerations, and consequently, social measurement has often been combined within the pillar of economic development (Vallance et al., 2011). As a result, relatively little literature is available on the topic of evolving social sustainability indicators for agriculture, in comparison to the advancement of economic and environmental indicators (Lebacqz et al., 2013, Bournaris and Manos, 2012). This dearth of literature has been attributed to the supposed ‘impracticability’ of social sustainability (Van Calker et al., 2007), the broad connotation of the word ‘social’ (Littig and Griessler, 2005), its subjective character (Latruffe et al., 2016) and to the differences in perceptions of social sustainability between farmers and other societal groups (Gaviglio et al., 2017).

Within the limited existing research on social sustainability, indicators have been defined as being internal or external (Van Calker et al., 2005, Van Cauwenbergh et al., 2007). Internal measures are farmer oriented including individual and farm family well-being, while external measures are community oriented relating to the values, concerns and demands of the wider rural society. Owing to the prevailing family farm ownership structure existing across the EU, (CSO, 2016), work life and private life of the farm holder and farm family can become

intertwined (Janker et al., 2019), necessitating a more holistic and thorough assessment of quality of working life (Gosetti, 2017). Internal measures address issues such as the working conditions for the farmer, their families and any employees (Van Calker et al., 2005), wellbeing, both physical and psychological, and education levels of the farm family. Van Cauwenbergh et al. (2007) further distinguished between physical and psychological well-being. The physical well-being of the farmer concerns relevant labour conditions and any associated health impacts, whereas the psychological aspects of well-being encompass issues relating to education, gender equality, autonomy, access to infrastructure and activities, integration and participation in society, both from a professional and a social perspective. The demographic viability of farm households is another important internal measure and the need for generational renewal has been well established as a key indicator of agricultural sustainability both within and outside the EU (Lillywhite et al., 2012, Fourrié et al., 2013, Van Calker et al., 2007, Wrzaszcz, 2014).

External social sustainability measures include, amongst other things, societal concerns regarding the impact of agricultural production and farming practices upon the wellbeing of human and animal welfare (Sydorovych and Wossink, 2007), the contribution of farmers to rural economies and communities, and the role of farmers in protecting cultural and heritage capital (Fourrié et al., 2013, Van Calker et al., 2005, Van Cauwenbergh et al., 2007, Hediger and Knickel, 2009, Lebacqz et al., 2013, Šūmane et al., 2018).

The public good generated by local farming activity to rural areas has been recognised through policy determinations over the past two decades, in particular focusing upon environmental public goods, such as the protection of biodiversity and maintenance of adequate water quality (Ciaian and y Paloma, 2011). In addition, agricultural processes can also contribute towards societal public good in rural areas, through agri-food provision and protection of cultural heritage (Maciejczak and Zakharov, 2011, Maier and Shobayashi, 2001), as well as utilising

and helping to maintain the rural socio-economic infrastructure (Dillon et al., 2016). At this point, there is growing awareness that factors impacting farm family wellbeing and their quality of life, rural viability and farm animal welfare need more robust and definite representation within the sustainability framework, in order to ascertain a more holistic view of sustainable agriculture to better inform society (Bacon et al., 2012, Ryland, 2015). With this in mind, this paper aims to develop a social indicator set suitable for the Irish agricultural production system, in which these topics of farm family wellbeing, animal welfare and rural viability are addressed.

2.1. Literature Review

Using the concepts of internal and external measures of social sustainability, a literature review was conducted in order to identify studies that have previously defined farm-level indicators of social sustainability. Online research databases provided access to a catalogue of peer reviewed papers discussing agricultural sustainability, therefore keywords which referred to topics of agricultural social sustainability, indicator development and sustainable development were employed to refine the scope of the study. Table 1 provides an overview of the studies reviewed, and demonstrates the various metrics developed and designates them as either having internal or external attributes.

Table 1: Attributes used in the literature to assess farm level social sustainability

<i>Internal indicators of Social Sustainability</i>	Ireland (Hennessy et al., 2013, Dillon et al., 2017)	U.K (Lillywhite et al., 2012)	France (Lebacqz et al., 2013) (Fourrié et al., 2013)	Belgium (Van Cauwenbergh et al., 2007)	Germany (Ehrmann and Kleinhanß, 2008)	Netherlands (Van Calker et al., 2007, Van Calker et al., 2005)	Pan-EU (Herrera et al., 2016a)	Italy (Gaviglio et al., 2017)	Poland (Wrzaszcz, 2014)	Spain (Batalla et al., 2014) (Arandia et al., 2011)	New Zealand (Hunt et al., 2014)	Quebec, Canada (Parent et al., 2013)
High Age Profile	X							X				
Household Vulnerability	X											
Quality of life/ Work Life Balance	X	X	X	X	X		X	X	X	X	X	X
Education Level	X	X	X	X	X		X	X	X	X		
Isolation Risk	X		X									
Succession Planning		X	X			X	X		X	X	X	X
<i>External Indicators of Social Sustainability</i>												
Animal Welfare		X	X			X		X		X		
Food Quality & Safety			X	X	X	X		X	X	X	X	
Multifunctionality			X			X	X	X	X		X	X
Access to services	X			X							X	
Heritage and Culture			X	X				X	X	X	X	
Stakeholder consideration & Consumer queries				X	X	X	X			X	X	

Internal Indicators:

Work-life balance and quality of life assessment: All of the studies reviewed examined the quality of working life of the farm holder. Many of these studies include an assessment of the total hours worked on the farm, (Hennessy et al., 2013, Parent et al., 2013, Lillywhite et al., 2012, Arandia et al., 2011). Eluding to the interconnection of both work and personal life of the farm holder, several other studies (Gosetti, 2017, Janker et al., 2019) attempted to develop overall life quality and level of autonomy indicators. Parent et al. (2013) evaluated the former through assessing farmer satisfaction with their role, stress levels experienced and the social supports available. Herrera et al. (2016a) outlined a series of self-reported indicators reflecting quality of life and autonomy in decision making for a sample of farms across ten EU Member States, while Arandia et al. (2011) measured the ability of Spanish farmers to make their own decisions.

Education level of the farmer: Several of the studies identified farmer education and on-going training as a relevant indicator of internal social sustainability. In this regard, the level of agricultural education attained by the farmer and/or members of the farm family can demonstrate potential future productivity improvements (Kelly et al., 2015). In addition to working conditions and quality of life, Lebacqz et al. (2013) recognised education as a reflective attribute of farmer wellbeing, and categorised education into three levels: professional experience, the attainment of a diploma and/or continuous training. Wrzaszcz (2014) surveyed farmers on their planned participation in various forms of education, with the majority reporting the need to develop their vocational qualifications. Furthermore, the level of education attained by members of a farm household can indicate likelihood of farm succession, with members with third level education 30% less likely to take over the dairy farm than members with a second level education alone (Hennessy and Rehman, 2007).

Succession Planning: The CAP continues to support the position of the family farm in Europe. Family farming is seen to be important to the social fabric of rural areas and to power sharing in the supply chain. Succession and generation renewal is critical to the long-term survival of family farms and is therefore important from a social sustainability perspective and features in many of the studies reviewed. Parent et al. (2013) examines four components of succession, designed to analyse all aspects of the succession process from examining the continuity value of the farm holding, establishing the presence of a successor for the farm, preparing and planning for retirement and farm succession integration. A number of other studies developed similar indicators of succession (Lillywhite et al., 2012, Hunt et al., 2014, Arandia et al., 2011, Herrera et al., 2016a).

High Age profile: Within the context of social sustainability, the demographic profile of a farm household can be indicative of farm and rural viability, and thus characteristics such as age should be a primary consideration for the development of the agricultural sector (Gaviglio et al., 2017). Hennessy et al. (2013) also included age profile as a measure of social sustainability, defining a high age profile household as one in which the farmer is aged 60 years or older, with no member of the household aged under 45 years of age.

Isolation risk of farmer: Isolation in rural areas is another oft-cited societal concern. Two of the studies reviewed identify isolation risk as a social indicator of farmer wellbeing. Lebacqz et al. (2013) classify isolation within the internal 'quality of life' attribute, reflecting the impact social isolation can have on farmer wellbeing. Hennessy et al. (2013) measures isolation risk as whether or not the farmer lives alone.

Household Vulnerability: Hennessy et al. (2013) defines a farm household as vulnerable if the farm business is not viable, and neither the farmer nor spouse is employed off farm.

External Indicators:

Food Quality and safety: This indicator of external social sustainability was evident in a large number of the studies (Van Calker et al., 2005, Lebacqz et al., 2013, Van Cauwenbergh et al., 2007, Ehrmann and Kleinhanß, 2008, Gaviglio et al., 2017, Arandia et al., 2011, Hunt et al., 2014). Consumer awareness of sustainably produced agricultural food products is growing and impacting purchasing patterns, (Vanhonacker et al., 2008), with the quality of agri-food products being identified as a proxy for the quality of the agricultural practices utilised (Wrzaszcz, 2014). In addition, several authors discussed the options afforded by food quality certification schemes (Ehrmann and Kleinhanß, 2008, Fourrié et al., 2013, Hunt et al., 2014). These accreditation schemes, such as organic certification, place of origin labelling or the Bord Bia 'Origin Green' sustainability programme (operating in Ireland), provides a means for certified farms to demonstrate their commitment towards safe and sustainable agri-food production (Bord Bia, 2015).

Multifunctionality of farms: The multifunctional role of farming, that is going beyond the role of primary food production to include the production of public goods was identified as an important social attribute in several studies (Fourrié et al., 2013, Van Calker et al., 2007, Gaviglio et al., 2017, Wrzaszcz, 2014, Parent et al., 2013, Hunt et al., 2014). The capacity of farmers to contribute towards their local economy and community was identified by Parent et al. (2013) where representative indicators measured farmer's contribution to local services and their social contribution. The importance of farm multifunctionality and diversification was discussed by Gaviglio et al. (2017), but was considered more from an economic rather than social perspective and discussed the importance of farm diversification as a method for resilience, allowing farmers to attain income from an alternative product or enterprise, such as agro-tourism or educational farms.

Heritage and culture: Many studies refer to the role of farmers as stewards of culture, heritage and traditional farming practices and many attempted to measure this contribution (Wrzaszcz, 2014, Lebacqz et al., 2013, Van Calker et al., 2005, Hunt et al., 2014, Gaviglio et al., 2017). Gaviglio et al. (2017) considered how the aesthetic quality of rural buildings and farm landscapes influenced the social aspect of sustainable agriculture, owing to the subjective externalities in rural areas. In their assessment of sheep farming in Northern Spain, Batalla et al. (2014) highlighted the significance of tradition and heritage on the viability of sheep farming systems in the region. In this study, various indicators were implemented to assess the dimension of tradition and landscape, such as the examination of pasture practices, farmer's use of local knowledge and natural resources, and their general care of the environment.

Stakeholder consideration and consumer perception: Several case studies highlighted the importance of constructing positive relationships between stakeholders/consumers and farm producers, with effective communication between both groups seen as a vital component of agricultural sustainability. Hunt et al. (2014) discussed how recognising stakeholder values and choices can help to benefit the wellbeing of local communities as well as food producers within New Zealand, through assessing the level of social cohesion within the value chain. Ehrmann and Kleinhanß (2008) also discussed the importance of stakeholder communication to further enhance the sustainable management of agriculture in Germany. A public relations indicator exists with the German agricultural society's (DLG) assessment system, where participating farms are scored on their involvement in local communication networks, and their engagement with non –governmental organisations, (NGOs).

Animal welfare: The inclusion of animal welfare assessment within the remit of external social measurement was common in many of the studies, (Van Calker et al., 2007, Lebacqz et al., 2013, Lillywhite et al., 2012, Arandia et al., 2011). Van Calker et al. (2007) and Lebacqz et al. (2013) considered two aspects of animal welfare measurement; animal welfare and animal health

assessment. In the most general terms, animal health refers to absence of disease or pathology in the animal, while the welfare of animals relates to the relationship of the animal with its environment, its comfort level, its access to food and clean water and its ability to express natural behaviours (Nicks and Vandenheede, 2014). Van Calker et al. (2007) considers both aspects of animal health and animal welfare as pertinent measures for assessment, and utilises the term ‘acceptable agricultural practices’ as an umbrella indicator for both. Arandia et al. (2011) linked five indicators in their assessment of animal welfare: animal health, frequency of visits by the farmer to the animals, freedom of movement of animal when stabled, quality of housing and duration on pasture.

Access to services: The availability of public and social services within rural regions can be indicative of viability, and can therefore be considered a reflective attribute of external social sustainability (Van Cauwenbergh et al., 2007). Two case studies outlined in Table 1 utilised ‘access to services’ as a social indicator. In an assessment of the sustainability status of small farms in Ireland, Dillon et al. (2017) examined access to local services such as post offices, Garda (police) stations, banks, public transport and medical services. Access to social amenities such as pubs or social clubs was also assessed. Van Cauwenbergh et al. (2007) considered access to services as an indicator reflecting the wellbeing of the community, assessing whether the farm family’s access to and use of social amenities is deemed acceptable.

From an analytical perspective, each of these indicators can assist researchers and policy makers to put a quantitative measure on the subjective matter of social sustainability. Understanding the dynamics that exist between the wellbeing of the farm, the viability of its rural community and societal considerations in matters regarding sustainable agri-food production is fundamental in order to successfully measure social sustainability (Dillon et al., 2016, Ryan et al., 2016).

Building on approaches reviewed in the literature, as discussed above, this paper aims to develop a framework to measure agricultural social sustainability at the Irish farm level. Indicators were chosen according to their overall suitability to the Irish context. The proposed framework, see Figure 1, draws on the concept of internal and external indicators, with a further ‘wellbeing’ sub-division established. Categorised within internal social sustainability, indicators reflecting farmer wellbeing include the work-life balance of the farmer, house hold vulnerability, their risk of isolation, the age profile of the farmer, the level of education attained and whether a succession plan or a successor has been established. Indicators comprising external social sustainability have been divided between animal wellbeing and community wellbeing. The contribution of farms to their local economy, through the delivery of agri-food products, use of local services and creation of employment opportunities is an indicator reflecting community wellbeing. Other wellbeing indicators include the implementation of food safety and sustainability certification standards, and consideration of stakeholder and consumer perceptions. The ‘access to services’ indicator assesses the availability of both public and private services in the local vicinity, reflecting the viability of the rural community, while measures taken by farmers to protect the regional landscape and farming traditions are assessed through the ‘heritage and culture’ indicator.

In light of increasing consumer demand for transparency on farm animal welfare standards, and the significant increase in Irish milk production following EU milk quota removal in 2015, it is expedient that measures to assess farm animal welfare are developed. A number of indicators are proposed for example, somatic cell count, which can be inferred as a general indicator of animal health (European Commission, 2017b), in addition to records of antibiotic use and herd mortality rates. Assessment of the age and quality of animal housing may be used as an indicator for the evaluation of animal comfort, while the duration of grazing reflects the

opportunity of the animal to express natural behaviour and is of relevance for the Irish grass based livestock production system.

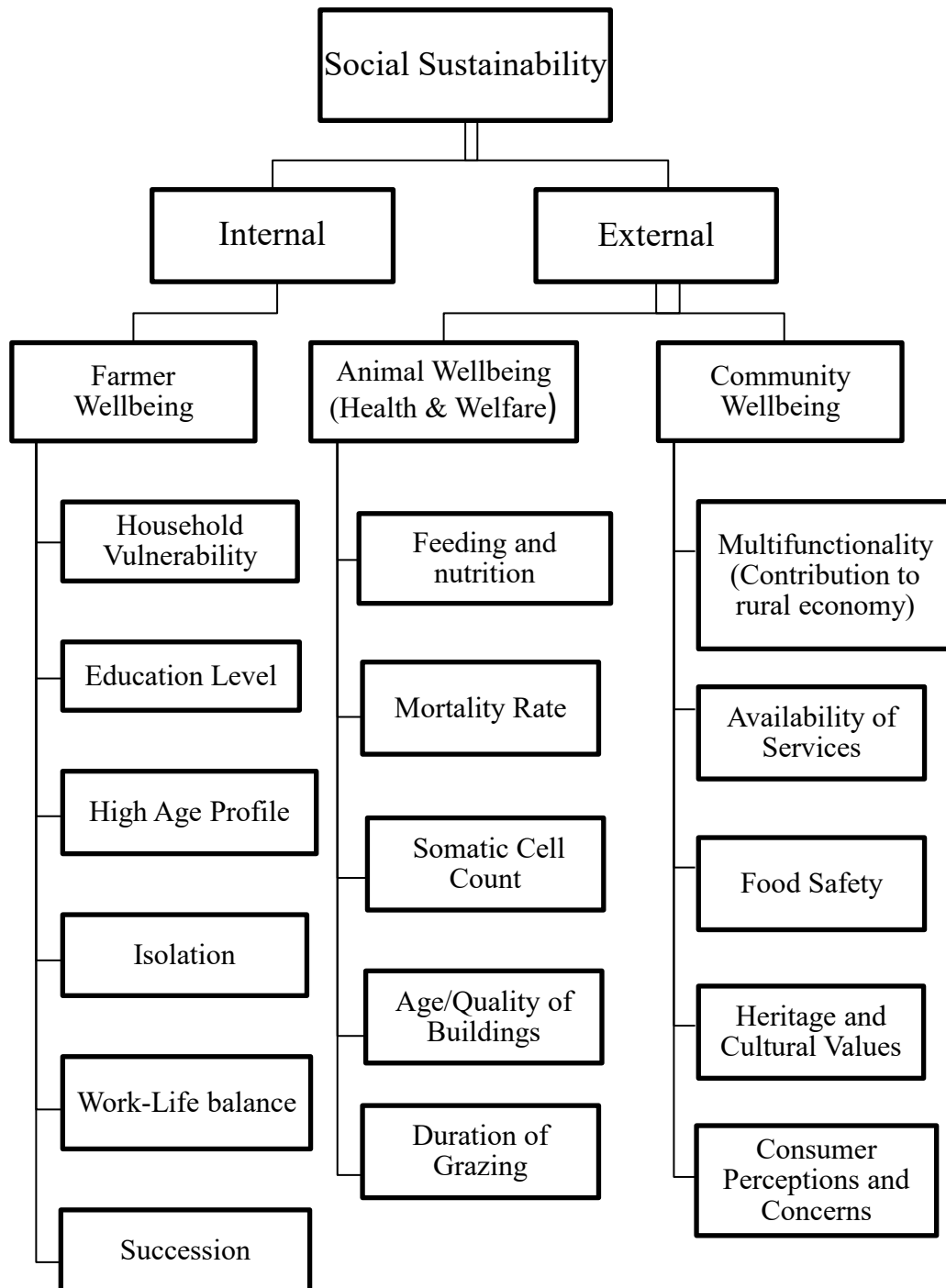


Figure 1: Index of proposed indicators of social sustainability for Irish farms, derived from literature review and international sustainability initiatives

Source: Author's own.

In order to ensure that relevant indicators are selected, and to collate a truly representative suite of social indicators for Irish agriculture, a stakeholder consultation process was conducted to validate the series of indicators outlined in Figure 1.

3. Methodology

Stakeholder consultation is a common component in many studies developing sustainability indicators, for example (Puhakka et al., 2014, Kelly et al., 2015, Herrera et al., 2016b, Fraser et al., 2006, Van Calster et al., 2007, Gaviglio et al., 2017) and is used to eliminate issues arising from one-sided ‘top-down’ management and policy developer decisions, and to facilitate a process of participation, allowing stakeholders to identify locally relevant indicators (Fraser et al., 2006). For the purposes of this study, a series of in-depth interviews were undertaken to assess the usefulness of the proposed social sustainability framework from a policy, consumer and societal perspective in the Irish setting.

These interviews were conducted with stakeholders representing a variety of sectors invested in agricultural and rural affairs, such as representatives of the Irish food industry, (dairy processors, a consumer insight group, a food exporting body), farmer representative groups, policy makers, sustainability officers in food companies, farm survey data collectors and academic experts from Irish and EU institutions. In total nineteen subjects were interviewed.

Stakeholders were selected on the basis of their expertise and knowledge regarding the various stages of the agricultural production system. Table 2 lists the stakeholder groups interviewed, along with the number and their country of operation. These interviews were conducted between November 2017 and May 2018, and contact with stakeholders was initiated by email and the interview conducted subsequently in most cases face to face and where not possible by

phone. The objective of these stakeholder interviews was to provide validation and feedback on the selection of proposed sustainability indicators and to contribute specialist knowledge towards public policy requirements, rural environment, the food industry, consumer needs and community development. Five of the nineteen stakeholders interviewed were academic experts based outside of Ireland, in various European research institutes and universities, specialising in the areas of agricultural sustainability, and/or rural development. This pan-European consultation broadened the perspective of the indicator analysis, and invited discussion on the various social indicators used internationally. In addition, these stakeholders provided insight on the list of potential sustainability indicators outlined, and views on the feasibility and the policy relevance of adapting such new social sustainability indicators within Ireland.

Table 2: Stakeholder groups consulted regarding their knowledge and insight into social sustainability, with number of stakeholders interviewed from each group in brackets.

Group	Reference Code	Country/ies	Description
Agricultural Policy & Farm Representative (2)	F.R	Ireland	Farm family representative and government advisor in agri-food sustainability
Farm Data Collectors (2)	D.C	Ireland	Teagasc National Farm Survey data recorders
Academic Researchers, IRL (2)	A.R (IRL)	Ireland	Professor of farm animal welfare, researcher of animal welfare indicator development
Rural Development (3)	R.D	Ireland	Rural Development Officers, Rural agricultural management and conservation, and social support groups
Academic Researchers, EU (5)	A.R (EU)	United Kingdom (2) Poland The Netherlands Germany	Rural development and conservation managers, coordinators of FADN systems, contact persons from FADN research institutions
Food and dairy processors, and sustainability officers (5)	P.S.O	Ireland	Sustainability officers, representatives of a dairy processing and milk cooperative , food safety and quality officer

A mixed-methods approach, allowing for the application of both qualitative and quantitative research methods (Creswell, 2013) was selected for data collection due to the broad and subjective nature of social sustainability. Concurrent data collection methodology was chosen for the stakeholder interviews as both qualitative and quantitative data could be collected simultaneously, with the qualitative aspect given predominance over the quantitative. All stakeholders were presented with the qualitative questions first, followed by the quantitative statements. Each of the nineteen interviews were voice recorded, and were transcribed by the author.

The qualitative aspect of the stakeholder survey was semi-structured consisting of seven open ended questions (contained in Appendix A), designed to ascertain the stakeholders' knowledge of current social sustainability indicators, in addition to inviting discussion on social challenges, concerns for rural viability and recommendations on indicator development. Following the mixed method research procedure adapted by Puhakka et al. (2014) and Herrera et al. (2016b), the qualitative analysis involved the application of coding to each transcription, resulting in the identification of primary themes. The characterisation of a theme was determined by the number of occurrences of a topic, or particular aspect of social sustainability, throughout the interviews. Primary themes were identified through the streamlining of the various topics that emerged, which sub-categorised individual and related themes into a common, manageable principal theme (Puhakka et al., 2014, Stenger et al., 2014).

The quantitative component of the survey comprised two sections of ranking statements (contained in Appendix B). Utilising the quantitative procedure of the mixed methods approach adapted Puhakka et al. (2014) and Carlyle et al. (2012) these statements provided a means for interviewees to rank both the usefulness and importance of measuring current social issues impacting agricultural sustainability. The first set of statements asked the stakeholders to list, by order of usefulness, nine different measures of social sustainability, where 9 was assigned to the measure they judged to be the most useful with 1 being least useful. These measures were derivative of the internal and external aspects of agricultural social sustainability, as discussed by (Lebacqz et al., 2013, Van Calster et al., 2005, Latruffe et al., 2016, Diazabakana et al., 2014, Herrera et al., 2016a, Arandia et al., 2011). The second section was comprised of twenty-five statements, which reflected the varying social perceptions surrounding agricultural sustainability. Following the methodical approach adapted by Puhakka et al. (2014), each statement reflected a specific social aspect or current issue impacting agriculture, as derived from the literature review. A 7 point Likert agreement scale was employed, and stakeholders

were tasked with scoring these statements depending upon their level of agreement with them (1=strongly disagree, 7= strongly agree). A descriptive analysis was conducted in IBM SPSS 24 on these 25 agreement scores, with the median score used as the measure for central tendency as the Likert scale variables are classified as ordinal (Sullivan and Artino Jr, 2013). The observation of the median agreement scores demonstrates the level of agreement the interviewees held with each of the 25 statements, and in particular, which statements proved to have the highest level of agreement or disagreement.

4. Results

In this section, themes arising from the qualitative coding processes from the interviews are presented, in addition to an overview of the level of agreement/disagreement with the specific ranking statements presented.

4.1 Qualitative Analysis: The main themes emerging from the qualitative aspect of the stakeholder interviews can be categorised as relating to Farmer, Animal and Community wellbeing; these were:

- Farmer's mental health and wellbeing
- Social isolation
- Succession
- Animal Welfare
- Rural policies and development,

Associated sub-themes were disclosed during the coding process, and were amalgamated into overarching primary themes, based upon their affiliation and relationship to the primary themes. Similarly, some of the themes are inter-related, in particular issues relating to farmer

wellbeing, isolation and succession. Animal welfare is quite specific with relevant policy measures considered at a more macro level. The primary themes and associated sub-themes are illustrated in Figure 2.

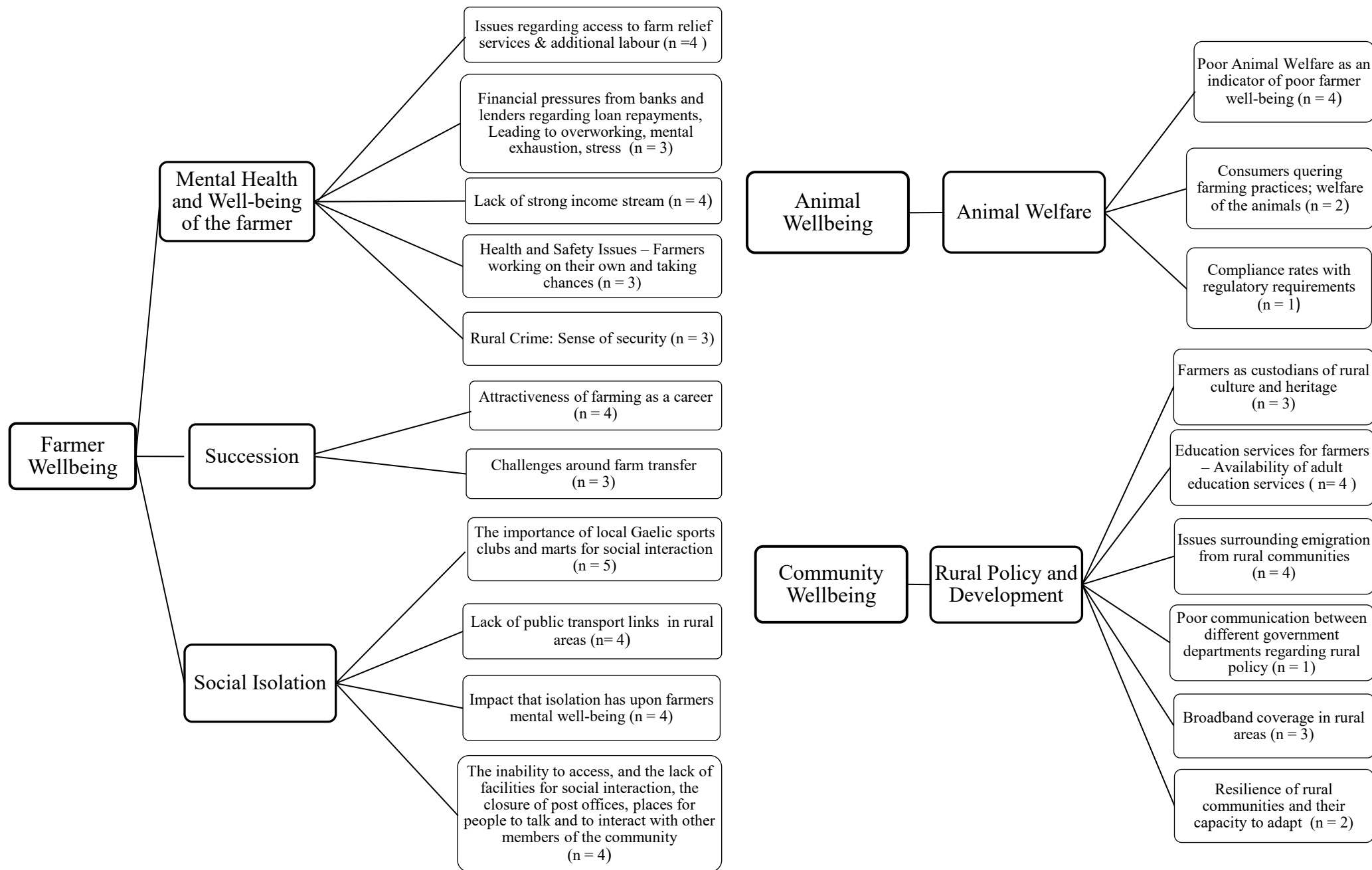


Figure 2: Themes extracted from the qualitative section of the stakeholder interviews; divided between Farmer, Animal and Community wellbeing (n= no of stakeholders who cited sub-theme)

The first theme, *Farmers' Mental Health and Wellbeing* was a principal concern for most stakeholders. These sub-themes included the effect of financial pressure on farmer wellbeing and issues such as inclement weather, fodder shortages and market developments. The timing of the data collection may be a factor here given the very difficult weather conditions in Ireland during winter 2017 and spring 2018 with much concern around fodder availability and farmers' associated stress levels. Other stressors cited by the interviewees included the effect that loneliness may have on the mental wellbeing of farmers, (R.D & F.R), in particular for those who live alone in isolated areas, (D.C & R.D). Aligned with this is the issue of health and safety and the fact that as many farmers work alone they may be more likely to take risks, or become complacent regarding their own safety. As to why this may be the case, one interviewee cited mental and physical exhaustion on the part of the farmer; "*lack of hours in the day to get the work done*" (F.R). It is noteworthy that in an Irish context the dairy sector has undergone immense structural change since the abolition of EU milk quota in 2015, with milk production increasing by 38% in the period 2014 to 2018 (CSO, 2019).

Incidences of rural and agricultural crime were also mooted as a considerable stressor. The closure of rural Garda (police) stations was cited by a number of stakeholders as having an adverse impact on the sense of security of residents in particular regions (R.D & F.R).

The issues surrounding *farm succession* emerged as the second theme from the qualitative component of this research, with the topic referenced by nine of the nineteen stakeholders. Various issues regarding farm succession and generational renewal were discussed, notably the idea that many farmers' children may have no interest or desire to continue running the family farm (F.R, D.C & P.S.O). Potential reasons put forward in this regard included the lack of a strong stable income stream (R.D), the perception of a poor work-life balance (D.C), more attractive job prospects elsewhere and the lack of interest in pursuing an agricultural career (P.S.O & A.R- EU), as well as more generally the lack of social amenities in rural areas (R.D

& A.R- IRL). The concept of succession may also prove to be a sensitive issue for many farmers to discuss with their children or potential heirs despite the efforts of many stakeholders to normalise the topic (Conway et al., 2017). Farmers may feel a sense of vulnerability or a loss of identity when considering succession, especially in cases where the farmer has worked and lived on the farm their entire life:

“Could the farmer feel vulnerable about where he’s going to be left? Putting pressure on farmers regarding succession and transfer, it’s fraught with tension. Look at well-being, how much of that disintegrates because of pressure to transfer?” (R.D).

Several interviewees also discussed the issues surrounding generational renewal on farms and the knock-on effect this is having upon the vitality of rural communities (R.D & P.S.O). This underlines the holistic nature of agricultural sustainability and implications for the wider rural community.

While the challenges and issues surrounding succession planning and generational renewal were deliberated primarily by the Irish stakeholders, two of the European academic researchers discussed how the issue of succession is gaining strength and recognition within European agricultural policy and research given an aging farm population.

The third theme which emerged from the interviews was the issue of *Social Isolation* amongst farmers. This was closely associated with several of the sub-themes extracted from Theme 1 (farmer wellbeing), in particular focusing on the impact that isolation may have on farmers’ wellbeing. This underlines the entwined nature of these issues.

“There’s a reluctance to talk about mental health, and like that, isolation contributes to having poor mental health” (R.D)

This was a common concern amongst the stakeholders, with many referencing aspects of social isolation as a primary concern and a particular social challenge facing Irish farming and rural communities more generally (R.D & P.S.O). As had arisen in the discussion of farmer wellbeing, several of the interviewees discussed the impact of the closure of various public amenities within rural communities as well as the deterioration of public transport links (F.R & R.D). As such, the existence of these facilities and structures were concluded to be an integral component of rural life, providing opportunities for social interaction, in addition to its primary service role.

“A lot of them too are very dependent on post offices for banking or paying bills.

There are worries like that as well, what they would consider essential services being taken away from them” (A.R- IRL).

Alongside this, the importance attributed to sports clubs and livestock marts were mentioned by some, providing an opportunity for social interaction for many, particularly those who may be somewhat isolated in their location, or for those living alone (R.D, P.S.O & D.C).

The fourth theme to emerge from the interviews related less to the individual and more generally to *rural development policy*. Various sub-themes contributed to this primary theme, notably issues around supporting the farm business e.g. poor quality broadband in rural areas. Several interviewees directly referenced this issue (R.D, F.R & P.S.O). Other sub- themes that were discussed by the interviewees included the youth emigration rates within rural communities and a subsequent reduction in the availability of additional farm labour.

“If you have really good agri-business in an area, it does keep the community together; it keeps jobs in the area” (P.S.O).

The concept of farmers being custodians of rural culture and agricultural heritage (Wilson et al., 2013, Koohafkan and Altieri, 2011) was put forward by three of the interviewees (A.R-EU, R.D & D.C). Here, the interviewees discussed how farmers contribute to the protection and enhancement of rural regions, through assisting in the maintenance of the rural landscape and through their participation in various agri-environmental schemes. The potential loss of specific cultural and rural knowledge from one generation of farmers to the next was also cited as a concern amongst the interviewees, with consideration towards the movement of younger generations from rural areas (P.S.O & R.D). The education services available to farmers emerged as an additional sub-theme within this primary theme, with four interviewees referencing this particular topic (R.D, P.S.O, A.R-IRL & A.R-EU). The interviewees discussed the importance of continued up-skilling amongst farmers, and the availability of adult education services in rural regions.

Several of the stakeholders discussed the issue of animal welfare, and examined the notion of it having a connection with the mental wellbeing of the farmer (D.C, R.D, F.R & P.S.O). It was the opinion of these interviewees that most farmers would categorise the health and comfort of their animals as an absolute priority, and would invest more time and consideration into ensuring the good health and welfare of their animals than they would their own health. Furthermore, these interviewees were of the opinion that any deviation from this standard, where farmers failed to uphold good welfare consideration of their animals, may in fact be inferred as a sign of poor farmer wellbeing. One stakeholder discussed their concerns regarding compliance rates with minimum regulatory requirements for farm animal welfare, and how non-compliance may pose a reputational risk towards the agri-food industry (A.R-IRL).

4.2 Quantitative Assessment: The first set of quantitative statements asked the stakeholders to rank, in order of usefulness, a series of nine social sustainability measures, where 9 was

assigned to the most useful measure, and 1 to the least useful. The average score for each measure was calculated, and is graphically displayed in Figure 3. 'Farmer wellbeing – physical and psychological', was ranked as the most useful measure, with the majority of the interviewees ranking it as their first choice. 'Succession and young farmer development' was ranked in second place, with 'farmers' sense of security' ranked in third place. 'Multifunctionality of the farm', 'access to services', 'animal welfare' and 'social outlet availability' were ranked in fourth, fifth, sixth and seventh place, respectively, with measures reflecting 'food security' and 'consumer preferences' ranking in eighth and ninth position. These results are in line with the findings from the qualitative analysis in terms of the prioritisation of themes. The second set of quantitative statements sought to determine the level of agreement the stakeholders held with various assertions of farm level social sustainability. Simple statistical analysis was conducted, and the results complement several of the themes derived from the qualitative analysis, most notably in access to high speed broadband in rural regions, the availability of additional labour for farmers, transport links and sense of security in rural areas.

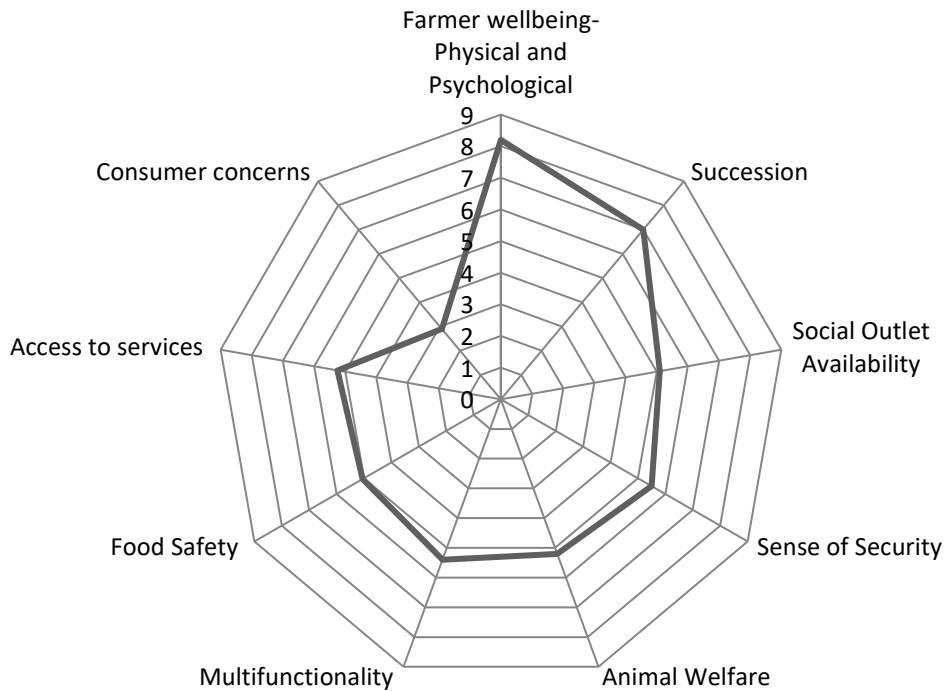


Figure 3: Stakeholder opinion on most important social sustainability measures for development and assessment (9= most useful, 1= least useful)

5. Discussion and Conclusions

The objective of this study was to propose a method of measuring social sustainability at the farm level, through the identification of individual indicators which sufficiently represent current trends with regard to agricultural sustainability. A stakeholder consultation process assisted in determining the most pertinent social issues impacting agriculture and rural development in an Irish context primarily. Utilising a framework which segregates the internal and external social attributes of sustainability into farmer, animal and community wellbeing, it was possible to design a stakeholder consultation process to inform and validate the prioritisation of thematic areas and the final identification of potential farm level indicators.

This three-pronged approach to wellbeing allowed for the identification of specific topics of concern amongst the stakeholders to emerge, most notably with regard to issues of farmer wellbeing and farm succession. These topics were regarded as high priority issues amongst the various stakeholders, as evident from both the qualitative themes and the results from the ranking statements. Concerns were also raised regarding the continued viability of many public services operating in rural communities, and the ability of farm families to access such services. In addition, stakeholders expressed concern regarding succession planning and generational renewal for rural communities more broadly. Many of the emerging themes demonstrate the holistic nature of agricultural sustainability, and the circular relationship which exists. The availability of services in rural areas and how this could affect farmers' sense of wellbeing was also raised. The intrinsic link between different aspects of social sustainability, and how one aspect may inadvertently be affected by the absence of another demonstrates the fundamental need to expand and develop relevant measures to ascertain a better understanding of farm level sustainability.

The current CAP 2014-2020 outlined several long term and broad ranging sustainability objectives within its remit, including a strategy to enhance rural development across member states. Building upon this objective, the CAP post-2020 aims to strengthen the socio- economic fabric of rural areas, though targeted objectives which focus on supporting generational renewal and vibrant rural areas, as well as ensuring a fair income for farmers and preserving landscapes and biodiversity. Moving forward, some work is required to link the sustainability of agriculture with activities in the wider rural economy, including those not directly involved with agriculture.

The development of sustainability metrics remains an iterative process. As the demand grows for additional data to measure agricultural sustainability it is imperative that indicators evolve to adequately assess all dimensions, including social. The framework proposed here will assist

in guiding the development of relevant social indicators for agriculture. In an Irish context, each of the selected indicators will assist in measuring specific attributes of social sustainability which are deemed significant for Irish agriculture, notably farm family wellbeing and generational renewal, animal welfare assessment and rural viability. While the scope of this indicator set is primarily focused on assessing the social sustainability of Irish agriculture, its overarching framework lends itself to a broader policy assessment across countries.

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Appendices.

Appendix A:

Qualitative Questions:

Q1: What do you understand by the term 'Social Sustainability'?

Q 2: Do you think that the current assessment of Social Sustainability needs to be developed for Irish agriculture?

Q 3: How well has the social sustainability of Irish farms been researched and understood by policy makers to date, in your opinion?

Q 4: What do you consider to be the most important social challenges facing agriculture and rural communities at present? (Focusing upon Farmer, Animal and Community Wellbeing)

Q5: Can you list your top 5 concerns for social sustainability and rural viability?

Q6: We plan to develop new social sustainability indicators under the areas of Farmer Wellbeing, Animal Wellbeing and Community Wellbeing. Is there another broad area of social sustainability which you believe should be researched further? What specifics would you consider?

Q7: Do you have any additional information or comments you wish to add pertaining to the topics you have discussed today? Do you have any recommendations on how you think the NFS could enhance its research into the social sustainability of Irish farms?)

Appendix B:

Quantitative statements:

1: Farmer Wellbeing

2: Animal Wellbeing

3: Community Wellbeing

We have subdivided these areas with the following measures; Can you rank the usefulness of assessing these measures in order from 1 to 9 (9=Most Useful)

Farmer Wellbeing:

- ___ Farmer Wellbeing, Physical and Psychological
- ___ Succession and Young Farmer development
- ___ Social Outlet availability (pubs, sports clubs, community centres etc.)
- ___ Sense of Security of farmer and household

Animal Wellbeing:

- ___ Animal Welfare and Animal Health

Community Wellbeing:

- ___ Multifunctionality of farm, contribution to rural region and economy
- ___ Food Safety
- ___ Access to services (transport links, banks etc.)
- ___ Consumer perceptions and concerns

Part 2: Ranking statements

Please rate the following statements on a scale of 1-7, where 1 = strongly disagree, and 7 = strongly agree. Please provide a justification for your rating.

Farmer Wellbeing: Physical & Psychological

- 1: (a) Farmers economic wellbeing has improved over the past 10 years ___
- (b): The work life balance and stressful nature of farming is impacting upon the psychological well-being of Irish farmers___
- (c): Farm holders have sufficient access to mental health support services ___
- (d): Farm holders are averse to seeking help or support from mental health services ___
- (e) Accidents on farms are caused primarily by farmers taking unnecessary risks ___
- (f) The lack of available farm labour will impact the expansion of dairy farms ___
- (g): The aging farm population in Ireland poses a challenge towards farm innovation and development: ___

Young Farmers and farm succession:

2: (a) The small proportion of young farmers in Ireland is primarily due to the unwillingness of older farmers to retire ____

(b): Younger farmers receive sufficient policy support to develop their livelihoods ____

(c): The availability of additional off farm employment for the household (farmer and/or spouse) is imperative for small farms to survive in rural regions ____

(d): Younger farmers are more willing to adapt innovative technologies than older farmers ____

(e): Young people are dis-incentivised towards establishing a career in farming due to perceived heavy workload/long hours ____

Sense of Security in rural communities

3: (a) Farmers sense of security has deteriorated over the past 5 years ____

(b): The closure of Garda stations has had no impact upon the sense of security in rural communities ____

(c): Older farmers are more vulnerable to incidences of agricultural crime than their younger counterparts ____

(d): Farmers must invest in anti-theft technologies (ie CCTV, sensor floodlights, equipment marking etc) to deter potential criminal activity ____

Animal Health and Welfare:

4: (a) The levels of antibiotic use in Irish livestock needs to be reduced ____

(b) Animal welfare standards on Irish farms is generally very good/ excellent ____

(c) Consumer awareness of animal welfare issues has no impact upon their purchasing of agri-food products ____

(d): Consumers would be willing to pay extra for an agri-food product produced with a high level of animal welfare considerations ____

(e): Ireland's natural and green image is of primary importance for global consumers of agri- food products ____

Community and Rural Wellbeing:

5: (a) Access to high speed broadband in rural regions is satisfactory ____

(b): Irish farms are a primary contributor towards the viability of the rural economy through their provision of agri-food products and use of local services ____

(c): The lack of frequent public transport links in rural regions can adversely impact the mobility of older residents: ____

(d): Consumers are increasingly querying sustainable farming practices ____

